Al-Kut University College

Nursing Department

كلية الكوت الجامعة

قسم التمريض

Computer Science

برنامج

Microsoft Excel

م.م حنين كاظم هويدي

Al-Kut University College

Nursing Department

كلية الكوت الجامعة

قسم التمريض

الفصل الأول

التعرف على البرنامج والتعامل معه :

1.1 Microsoft Excel :

هو برنامج الجداول الالكترونية الذي يتيح تخزين كم هائل من البيانات في جداول والقيام بالعمليات الحسابية والتحليلات الاحصائية عليها وانشاء الرسوم البيانية عليها ويقوم بمعالجة ودعم الدوال المختلفة وكذلك قواعد البيانات ويقوم البرنامج بعرض ورقة عمل تتكون من صفوف واعمدة.

1.2 خواص البرنامج :

ادخال البيانات بطريقة سلسة.

تحليل البيانات بسرعة فائقة .

عرض نتائج التحليل للمستخدم بطرق مختلفة حسب رغبة المستخدم .

احتوائه على دوال كثيرة في كل المجالات.

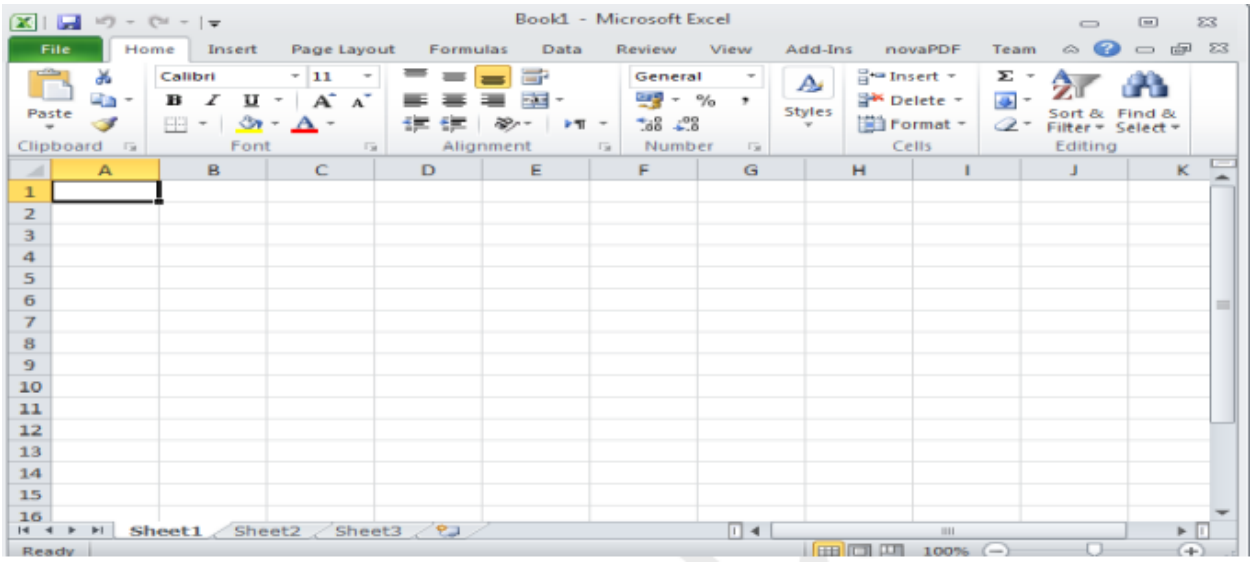
1.3 تشغيل البرنامج :

لتشغيل البرنامج نتبع الخطوات التالية

Start→ Search → Microsoft Excel 2010

او النقر على ايقونة البرنامج الموجودة على سطح المكتب مرتين مزدوجتين.

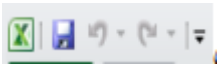
عند تشغيل البرنامج ينشأ مصنف فارغ تلقائيا يحتوي على ثلاث أوراق عمل منفصلة كما موضح في الشكل:



1.4 مكونات نافذة البرنامج :

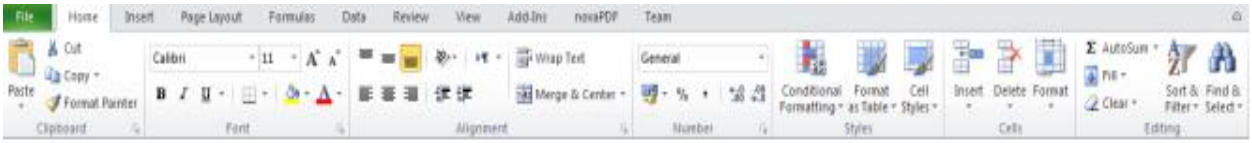
1. شريط العنوان :

وهو الشريط العلوي ويتضمن عنوان المصنف المفتوح وحين نفتح مصنفا جديدا فأن اكسل يعطيه الاسم Book1 وعند خزن المصنف باسم جديد فان هذا الاسم الجديد يظهر على شريط العنوان ويحتوي على ايقونات التصغير والتكبير والاغلاق للنافذة

ويحتوي على شريط أدوات الوصول السريع الذي يضم الأوامر التي تستخدم بكثرة اثناء العمل 

2. شريط التبويب :

يحتوي على عدة تبويبات وعند النقر على احداها تظهر اوامر تكون مرتبة في مجموعات منفصلة

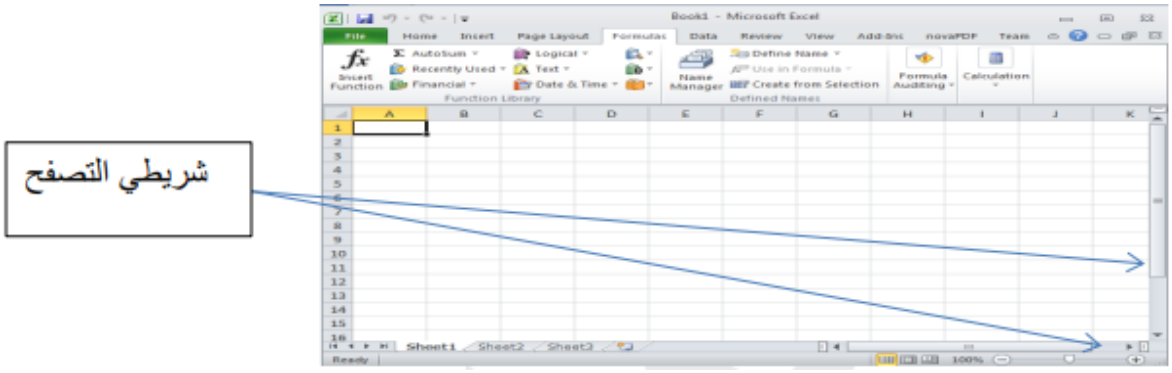


3 .شريط الصيغة الرياضية Formula Bar:

وهو الشريط الذي يظهر محتويات الخلية النشطة ان كانت صيغة رياضية او اي معطيات اخرى كما في الشكل.

4.شريط التصفح Scroll Bar :

يستخدمان عندما تكون ابعاد المصنف اكبر من ابعاد الشاشة

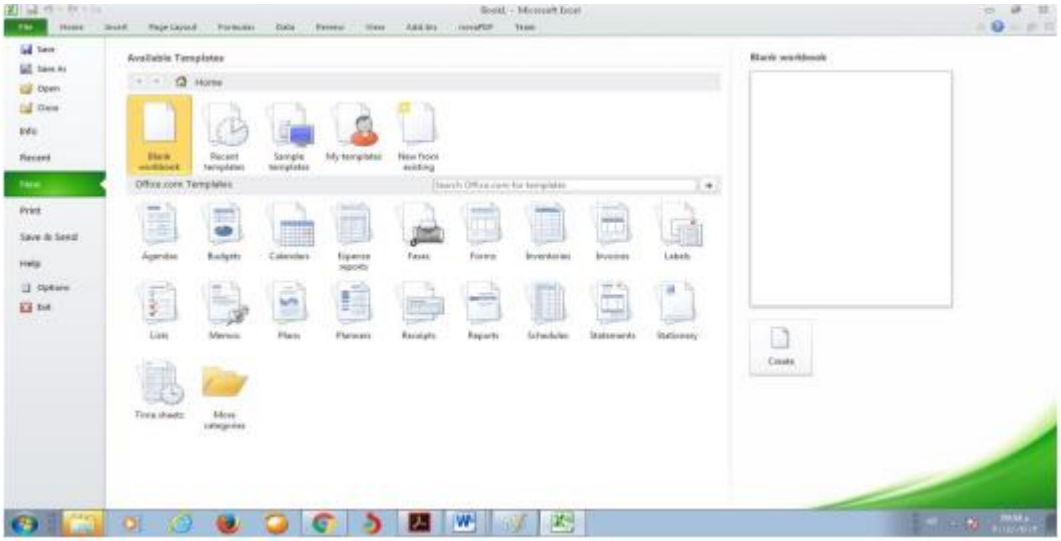


5. شريط الحالة Status Bar:

يظهر اسفل الشاشة ويبين طرق عرض المصنف اضافة الى معلومات مختصرة عن حالة المصنف الحالية

6. قائمة الملف File menu:

تحتوي على عدد من الأوامر الموضحة بواسطة ايقونات مثل الحفظ Save و الحفظ باسم Save as وفتح مصنف قديم مفتوح مسبقا open والغلقclose وفتح مصنف جديد new والتي يتم تنفيذها مباشرة او بعد ظهور مربع حوار و تحتوي أيضا على مجموعة ثانية من الأوامر التي تظهر تفاصيلها كما في الشكل



7- شريط الأوراق :

وهو الشريط الذي يحتوي على اسماء لعدد الاوراق الموجودة في الملف نفسه وعند انشاء اي ملف سوف تظهر ثلاث اوراق في الملف ولكن يمكن اجراء عليها بعض التغييرات مثل ادراج اوراق عمل اخرى او الحذف او تغيير اسمائها او تغيير مواقعها ويظهر كما في الشكل.

8- ورقة العمل Work sheet :

المصنف Bookعبارة عن ملف في برنامج Excel يحتوي على

Worksheets أوراق عمل تتكون من مجموعة من :

-الصفوف Rows هي مجموعة الخلايا التي تترتب افقيا في الجدول و يشار اليها بالأرقام.

- الاعمدة Columns هي مجموعة الخلايا التي تترتب عموديا في الجدول ويشار اليها بالحروف.

- الخلية Cell هي عبارة عن تقاطع الصف والعمود ولها عنوان يدعى مرجع الخلية ويتكون من حرف ورقم فالحرف يحدد العمود والرقم يحدد الصف مثلا المرجع D7 يحدد الخلية الواقعة في العمود D والصف 7

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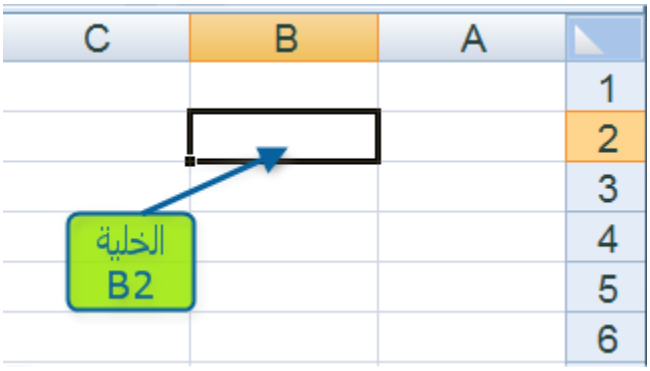


وللكتابة داخل خلية قم بتحديد الخلية ثم اكتب ما تريد من بيانات سواء نصية او رقمية او دوال او وقت وتاريخ .....

وهناك اساسيات وقواعد يجب اتباعها لضبط عملية الكتابة في ورقة العمل وهي :

- لتحويل الكتابة من اللغة الانكليزية الى اللغة العربية او للعكس نضغط مفتاحي (Shift +Alt)

- لتحويل جهة الكتابة من اليسار الى اليمين نضغط على (Ctrl+Shift) من جهة اليمين من لوحة المفاتيح ولتحويل جهة الكتابة من اليمين الى اليسار نضغط على (Ctrl+Shift) من جهة اليسار

- نستطيع التحكم بموقع مؤشر الكتابة من خلية الى اخرى عن طريق مؤشر الماوس او عن طريق مفاتيح الاتجاهات في لوحة المفاتيح

- لنقل المؤشر الى بداية الصف نضغط على مفتاح Homeمن لوحة المفاتيح

- لمسح كلمة او فقرة حددها ثم اضغط مفتاح Delete

1.5 التعامل مع الخلايا

يتم التعامل مع الخلايا وكذلك الاعمدة والصفوف كباقي العناصر في ويندوز من تحديد ونسخ ولصق وحذف وسحب.

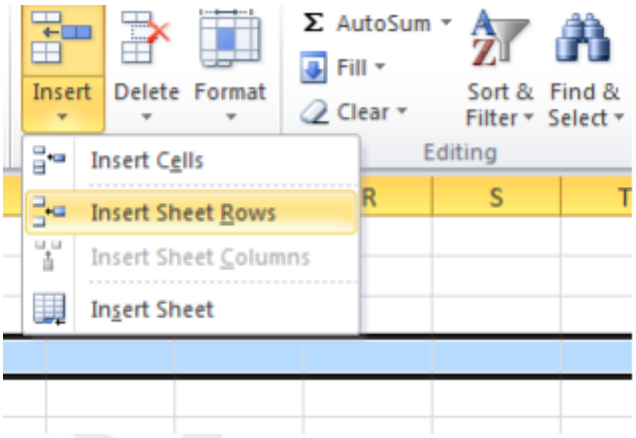
1.5.1 الادراج

أولا: ادراج صف Insert a row

لإدراج صف او اكثر عند نقطة ما في ورقة العمل نضع المؤشر في بداية الصف الذي نريد إضافة صف جديد قبله ومن تبويب الصفحة الرئيسية Home

ومن مجموعة خلايا Cells ننقر السهم الموجود الى جانب ادراج ثم ننقر

فوق ادراج صفوف جدول Insert sheet rows كما في الشكل

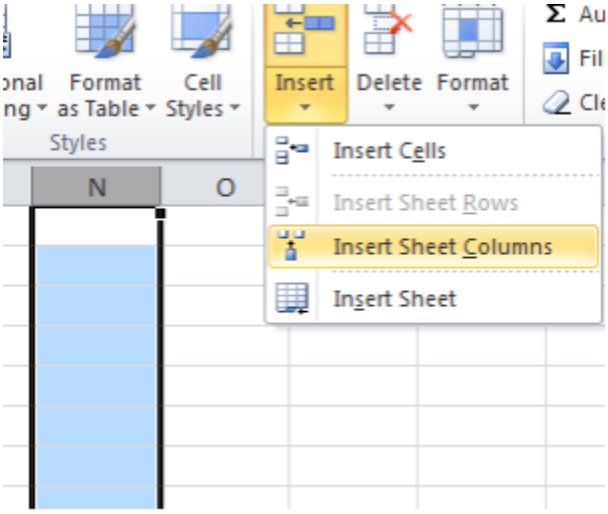


ثانيا : ادراج عمود Insert a column

لإدراج عمود او اكثر عند نقطة ما في ورقة العمل نضع المؤشر في بداية العمود الذي نريد إضافة عمود جديد قبله ومن تبويب الصفحة الرئيسية Home

ومن مجموعة خلايا Cells ننقر السهم الى جانب ادراج ثم ننقر فوق ادراج اعمدة

جدول Insert sheet columns كما في الشكل



1.5.2 حذف صفوف او اعمدة Delete rows or columns

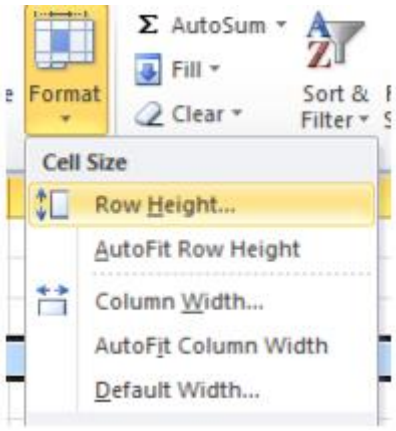
يمكن حذف صفوف او اعمدة باكملها من ورقة العمل بالنقر على عنوان العمود او الصف الذي نريد حذفه ومن تبويب الصفحة الرئيسية Homeومن مجموعة خلايا

Cells ننقر السهم اسفل Delete كما في الشكل

لحذف صف ننقر حذف صفوف جدول Delete sheet rows فتتحرك البيانات المسجلة أسفل الصف المحذوف الى الأعلى ولحذف عمود ننقر حذف أعمدة جدول Delete sheet columnsفتتحرك البيانات المسجلة بعد العمود المحدد الى موقع العمود المحذوف

1.5.3 تعديل ارتفاع الصف

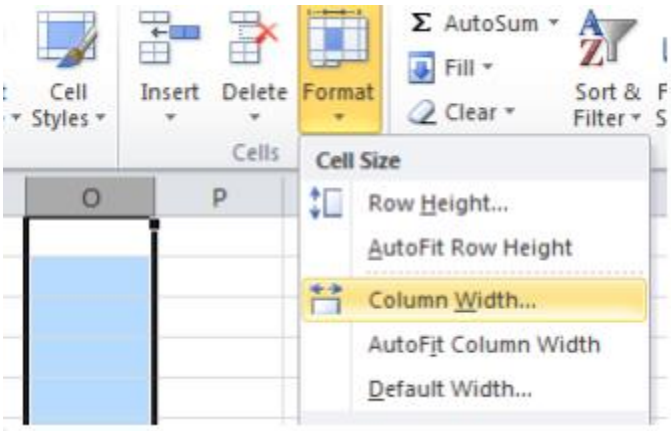
عندما نريد ان نعدل ارتفاع صف معين ليتناسب مع البيانات المدخلة نحدد الصف ومن تبويب الصفحة الرئيسية Home ومن مجموعة خلايا Cellsننقر السهم اسفل Formatثم ننقر فوق ارتفاع الصف Row height كما في الشكل



وتظهر نافذة تحديد ارتفاع الصف ويمكن تحديد ارتفاع الصف بشكل تلقائي استنادا الى حجم البيانات بالذهاب الى تبويب الصفحة الرئيسية Homeومن مجموعة خلايا Cellsننقر السهم اسفل Format ثم ننقراحتواء تلقائي لارتفاع الصف Auto fit row height

1.5.4 تعديل عرض العمود

عندما نريد ان نعدل عرض عمود معين ليتناسب مع البيانات المدخلة نحدد العمود ومن تبويب الصفحة الرئيسية Homeومن مجموعة خلايا Cellsننقر السهم اسفل Formatثم ننقر فوق عرض العمود Column width كما في الشكل



وتظهر نافذة تحديد عرض العمود

ويمكن تحديد عرض العمود بشكل تلقائي استنادا الى حجم البيانات بالذهاب الى تبويب الصفحة الرئيسية Homeومن مجموعة خلايا Cellsننقر السهم اسفل Formatثم ننقر احتواء تلقائي لعرض العمود Auto fit column width

1.5.5تنسيق النص Text formatting

يمكن تنسيق النص الموجود في ورقة العمل من حيث لون الخط ونمطه ولونه كما يأتي :

1.يجب تحديد الخلايا المطلوب اجراء التنسيق عليها حتى وان كانت خالية من البيانات

2.نذهب الى تبويب الصفحة الرئيسية Home ومنه الى مجموعة الخط

Font وننقر السهم الموجود في الزاوية اليمنى السفلى من المجموعة فتظهر قائمة بانواع الخطوط المتوفرة حيث يمكن اختيار الخط الذي نريد ويمكن التحكم بحجم الخط ولون الخط ونمط الخط

1.5.6 نسخ محتويات الخلية Copy the cell contents

تتم عملية النسخ بتحديد الخلايا Cells المطلوب نسخها ثم ننتقل الى تبويب الصفحة الرئيسية Homeومن مجموعة الحافظة clipboardننقر نسخ copy فيظهر اطار منقط حول الخلايا المطلوب نسخها ثم نحرك المؤشر الى الموضع المطلوب النسخ اليه ومن مجموعة الحافظة clipboard في الصفحة الرئيسية ننقر لصق paste فيتم نسخ المعلومات الى الموضع المطلوب

1.6 التعبئة التلقائية Auto fill

تستخدم التعبئة التلقائية لنسخ البيانات او القيم الحسابية او الارقام او التواريخ الى عدة خلايا متتالية في ورقة العمل كما يأتي:

نذهب الى الصفحة الرئيسيةHomeومن مجموعة تحريرEditing ننقرFill

فتظهر لنا القائمة التالية :

1.لتعبئة مجموعة من الخلايا بنفس قيم خلية معينة نقوم أولا بتحديد قيمة الخلية الأصل ثم نختار اتجاه الخلايا (left,righ,up,down)المراد تعبئتها

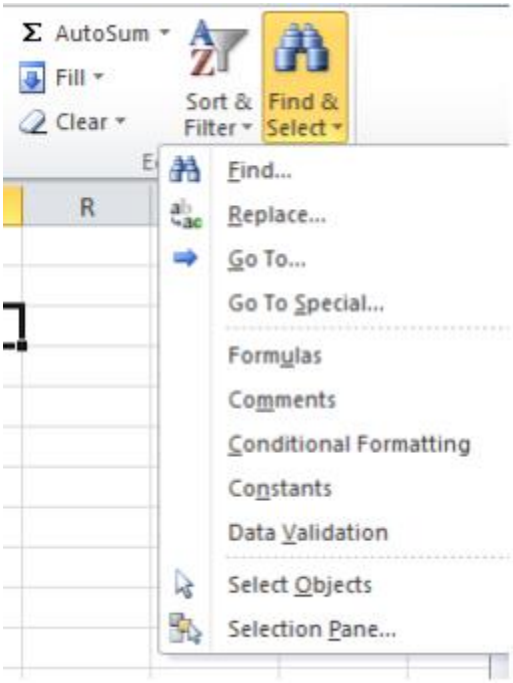
2.لتعبئة مجموعة من الخلايا بتزايد معين نقوم أولا بتحديد قيمة الخلية الأصل ثم نقوم بتحديد هذه الخلية مع الخلايا المراد تعبئتها ثم من قائمة تعبئة Fillنختار الايعاز سلسلة series حيث تظهر لنا نافذة فنحدد أولا اتجاه الصف او العمود من Series inونحدد نوع التعبئة type ثم نحدد قيمة التزايد في حقل قيمة الخطوة (step value)مثلا 10 ونحدد قيمة التوقف(stop value)مثلا الى غاية 50 ثم نضغط ok نلاحظ ان الخلايا التي حددناها تم تعبئتها بتزايد مقداره 10

3.لتعبئة مجموعة من الخلايا بتسلسل معين مثلا ارقام او حروف او أيام الأسبوع او الأشهر وغيرها من المتسلسلات نحدد بداية التسلسل ونوعه في الخلية الأصل ثم نقوم بتحديد هذه الخلية مع الخلايا الأخرى المراد تعبئتها ثم من قائمة تعبئة fill نختار الايعاز seriesثم نختار الامر تعبئة تلقائية Auto fill في الحقل نوع type فتتم التعبئة

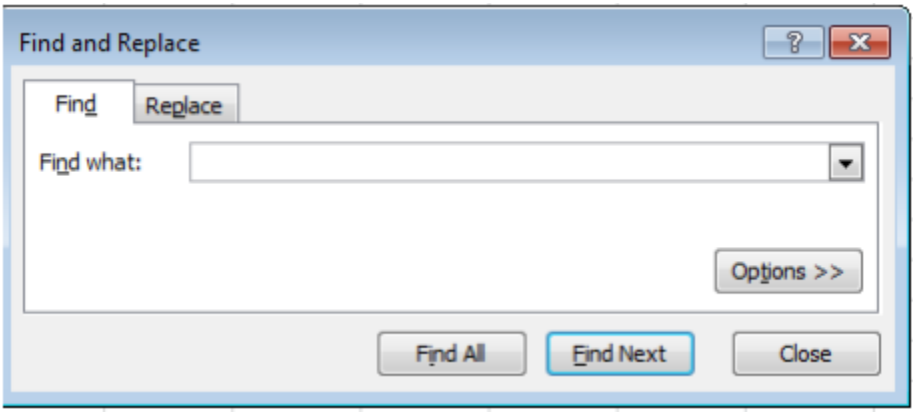
1.7 البحث والاستبدال Find and replace

للبحث عن رقم او كلمة معينة او نص او معادلة في ورقة العمل نتبع ما يأتي:

1.نذهب الى تبويب الصفحة الرئيسية Homeومن مجموعة تحرير editing ننقر بحث وتحديد Find & select كما في الشكل:

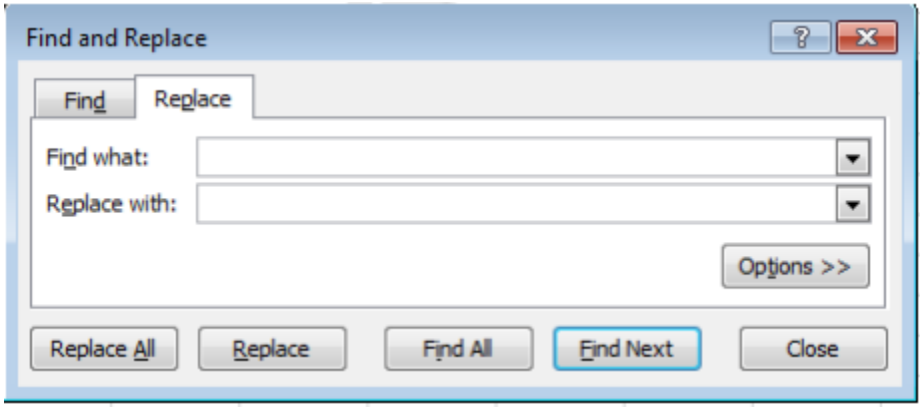


2. من هذه القائمة ننقر بحث واستبدالfind & replace كما في الشكل:



3.في مربع البحث find what نكتب الكلمة التي نريد البحث عنها ثم ننقر البحث عن التالي find next ونستمر في البحث عن الكلمة في بقية المواضيع

4. اما عندما ننقر تبويب استبدالReplace فيظهر مربع استبدال بـ Replace with فنكتب القمة الجديدة ثم ننقر استبدال إذا أردنا استبدال الكلمة أينما وجدت فننقر استبدال الكل replace all



1.7 تنسيق ورقة العمل

يمكن اجراء مجموعة من العمليات على ورقة العمل وذلك من خلال النقر على اسم ورقة العمل right clickفي أسفل الشاشة سوف تظهر قائمة وكما يأتي :

Insert : والتي من خلالها يمكن ادراج ورقة عمل جديدة

Delete : والتي من خلالها يمكن حذف ورقة العمل المحددة

Rename : والتي من خلالها يتم تغيير اسم ورقة العمل

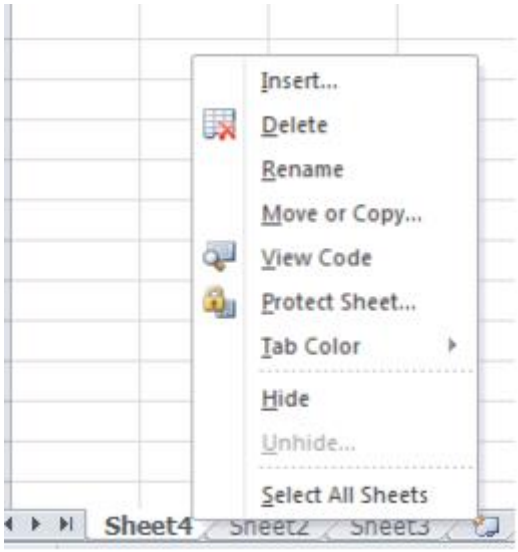
Move or copy : والتي من خلالها يمكن نقل موقع ورقة العمل او استنساخها

Select all sheets : والتي من خلالها يمكن تحديد جميع أوراق العمل

Tab color : والتي من خلالها يتم تغيير لون خلفية ورقة العمل

Hide : لإخفاء ورقة العمل واظهارها عند الحاجة

Unhide : لإظهار ورقة العمل التي تم اخفاؤها



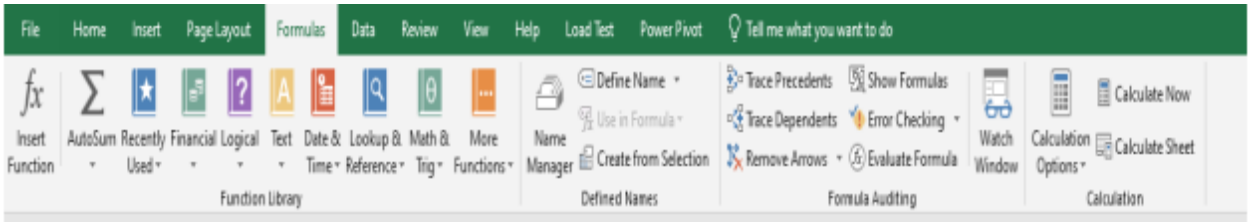
1.8 تبويب الصيغة Formula tab

- مكتبة الدالات Function library : أوامر لادراج وظائف اكسل المضمنة والعمل بها مثل SUM, IF, AVERAGE.

- الأسماء المعرفة Defined name : أوامر لإنشاء وإدارة النطاقات والصيغ المسماة.

- تدقيق الصيغة Formula auditing : أوامر لتتبع وتقييم الصيغ مثل تتبع السوابق وتتبع التابعين وتقييم الصيغة.

- الحساب Calculation : أوامر للتحكم في اعدادات الحساب في اكسل مثل الحساب التلقائي او اليدوي وجداول البيانات.



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قسم التمريض

بناء الجملة Syntax

تستخدم الصيغة في برنامج اكسل لإجراء العمليات الحسابية الرياضية تبدأ الصيغة دائما بعلامة يساوي = المكتوبة في الخلية متبوعة بالعملية الحسابية التي اجريتها.

خطوات انشاء الصيغ:

حدد خلية

اكتب علامة المساواة =

حدد خلية أو اكتب قيمة

أدخل عامل حسابي

حدد خلية أخرى أو اكتب قيمة

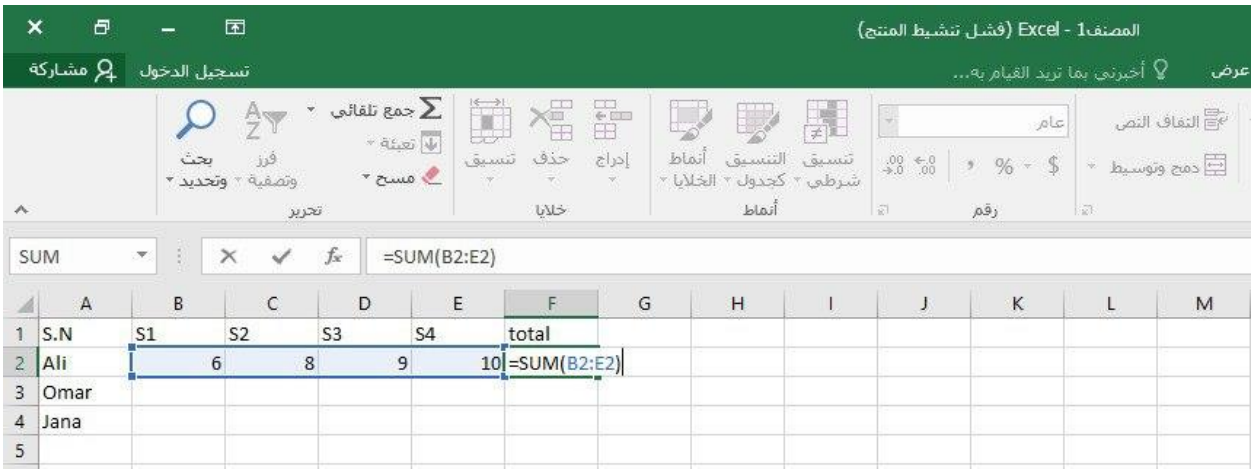
اضغط على Enter

على سبيل المثال، =1+1 هي الصيغة لحساب 1+1=2

- دالة الجمع Sum function

هي اهم دالة في برنامج الاكسل وربما اكثرها استخداما على الاطلاق فهي تقوم بجمع الأرقام سواء كانت في خلايا منفصلة او في نطاق متسلسل وتكون بالصيغة التالية :

= sum(number1, [number2],...)



=SUM(B2:E2)

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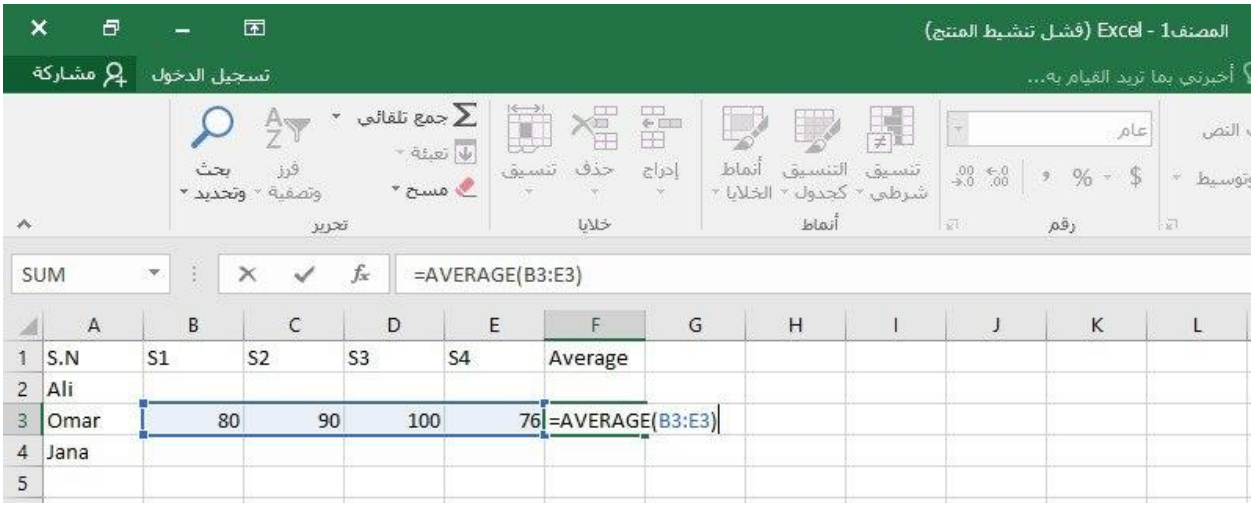
قسم التمريض

دالة المتوسط Average function

تستخدم هذه الدالة لإيجاد المتوسط الحسابي لمجموعة من الأرقام وتكون بالشكل التالي :

=average(number1, [number2],...)

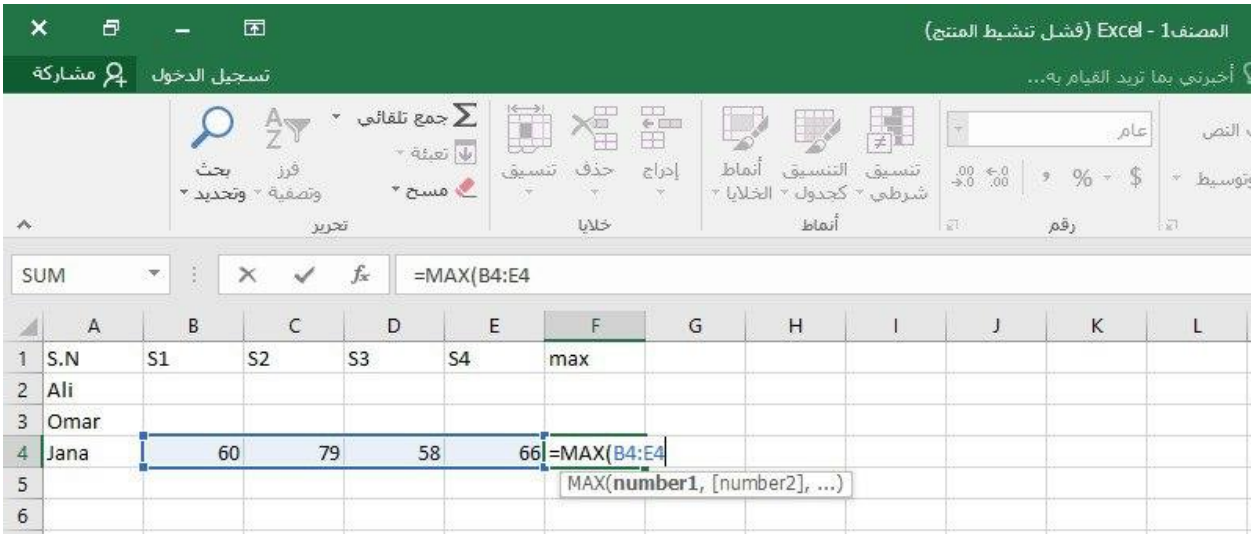


=AVERAGE(B3:E3)

Max function

تستخدم هذه الدالة لاستخراج أكبر قيمة وبالصيغة التالي:

=max(number1,[number2],...)

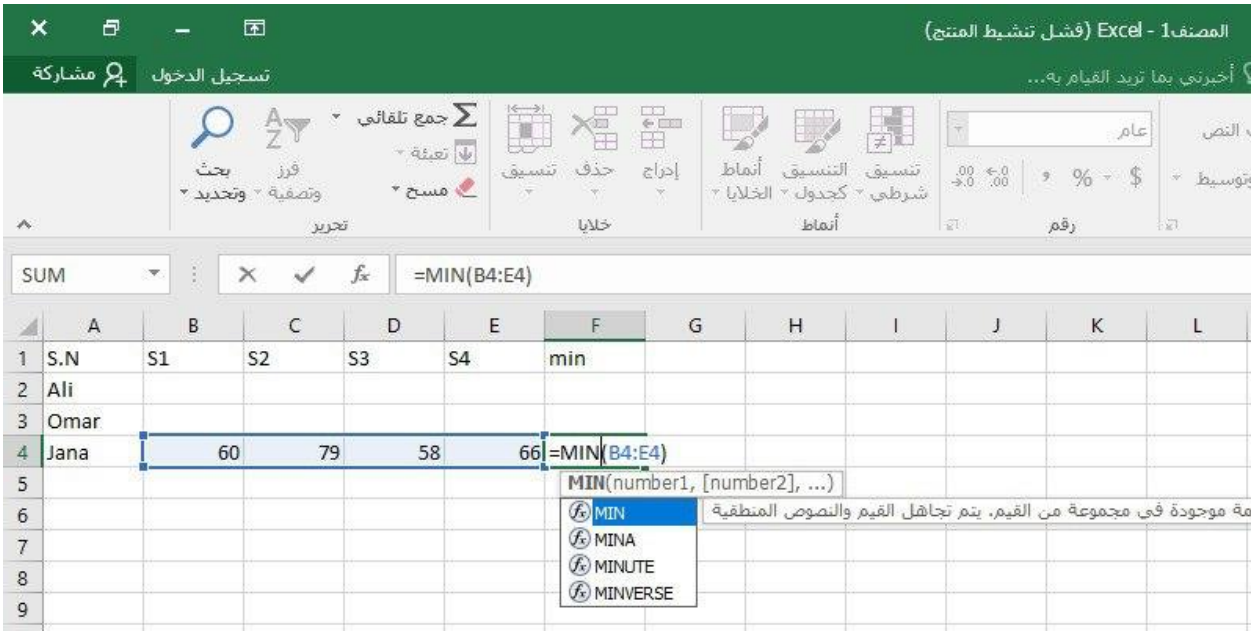


MAX(B4:E2)

MIN function

تستخدم هذه الدالة لاستخراج أصغر قيمة وبالصيغة التالية:

=min(number1, [number2],...)

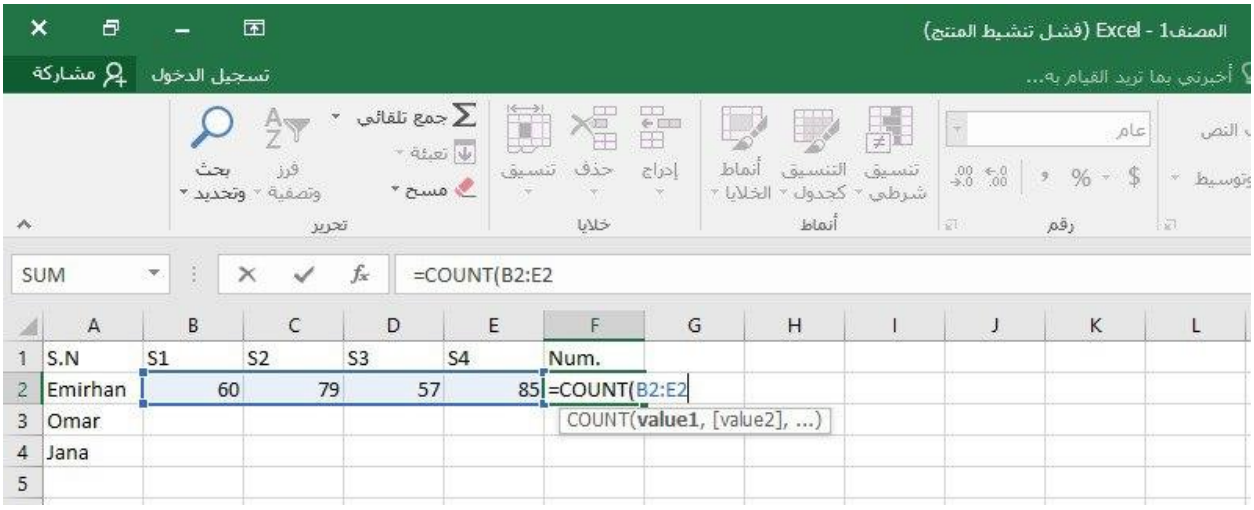


=Min(B4:E4)

Count function

تستخدم هذه الدالة لحساب عدد الخلايا التي تحتوي على ارقام وبالصيغة:

=count(value1, [value2],..)

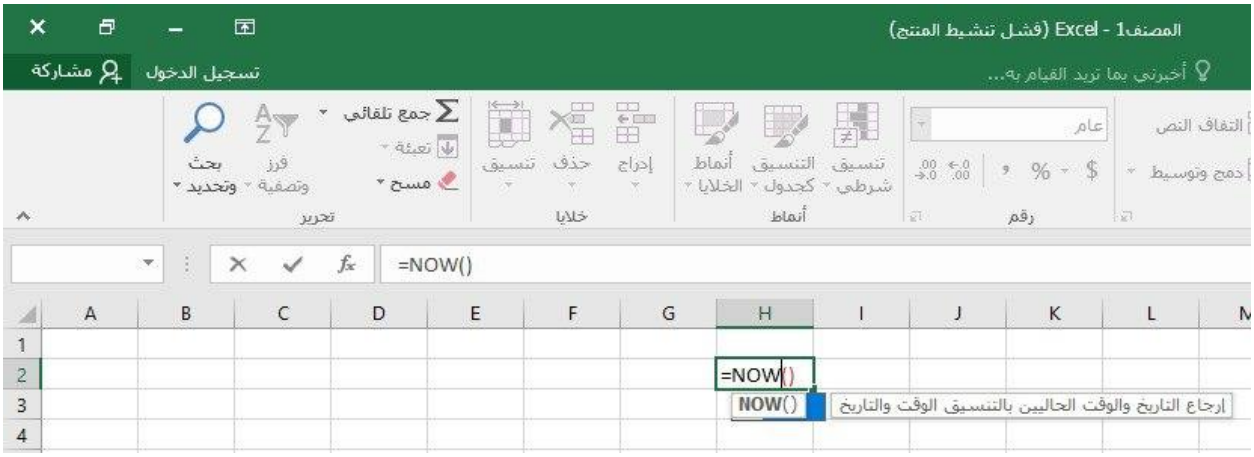


=count(B2:E2)

Now() function

تستخدم هذه الدالة لإضافة الوقت والتاريخ بالصيغة التالية:

=Now()



كلية الكوت الجامعة

Kut University College

Lecture 2 : computer components

By:

Assistant Lecturer Rana Mohammed Najim

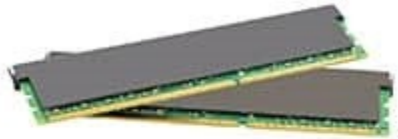
Introduction:

computers are powering everything from our personal lives to complex business operations. But behind every computer is a collection of key components that make it all possible. Knowing the parts of a computer and their functions helps you understand how computers work, and can also guide you when you're looking to upgrade, repair, or build your own system.

Here's a breakdown of the major components and what they do.

PARTS OF A COMPUTER

RAM



MOTHERBOARD

CPU

COMPUTER CASE

PSU

HDD

SPEAKERS

KEYBOARD

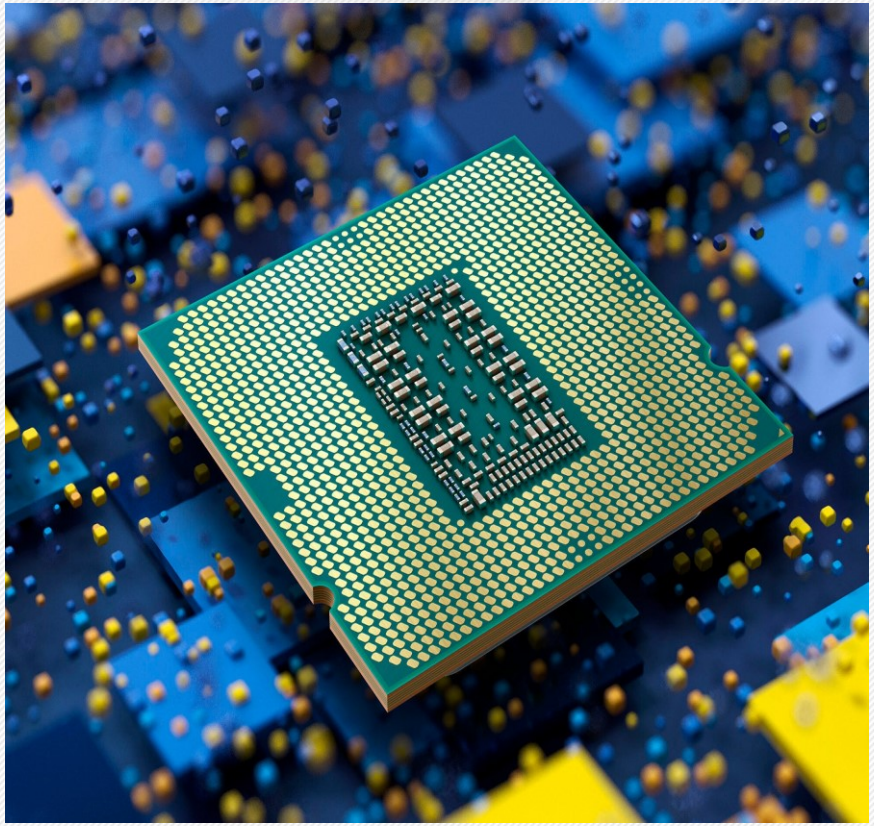
MONITOR

MOUSE

Parts of a Computer and Their Functions:

1. Central Processing Unit (CPU)

At the heart of every computer lies the **Central Processing Unit (CPU)**, often called the “brain” of the computer. The CPU is responsible for executing instructions, performing calculations, and processing data from programs and applications.

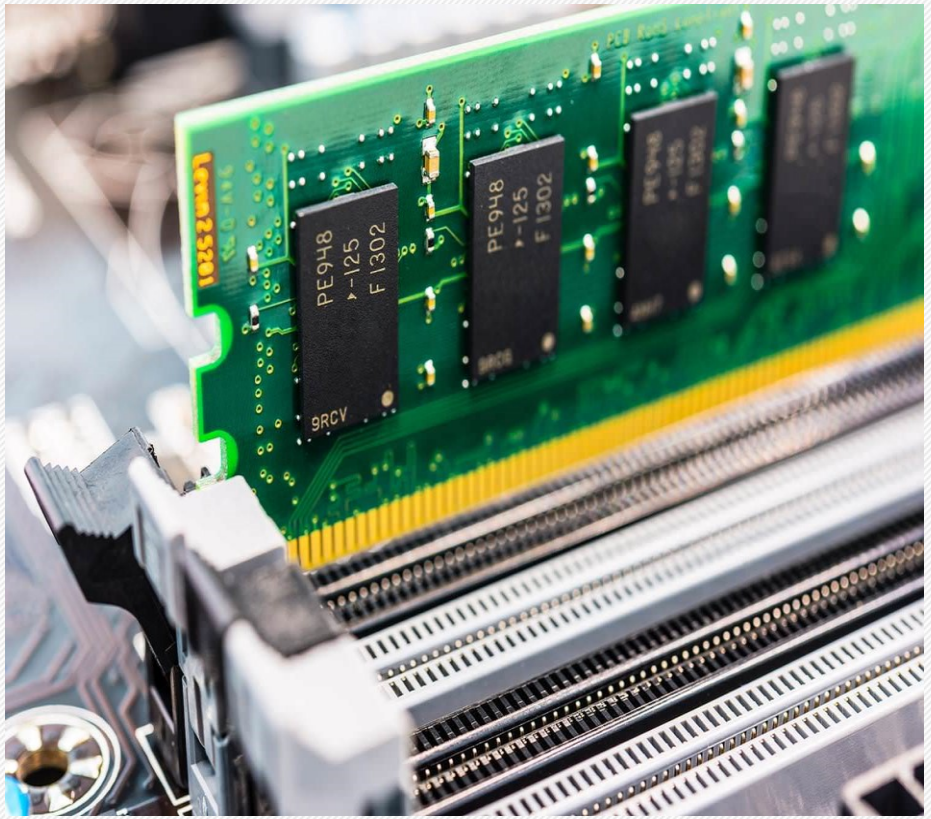


Parts of a Computer and Their Functions:

2. Memory

A. Random Access Memory (RAM)

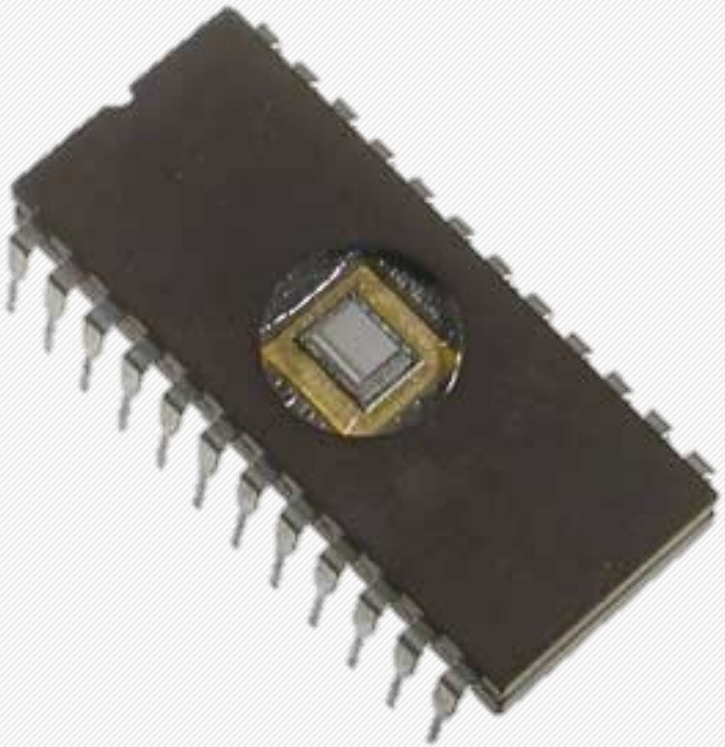
Random Access Memory (RAM) is a vital component of the computer. Often referred to as the computer's "short-term memory," RAM temporarily stores data that the CPU needs quick access to while running programs.



Parts of a Computer and Their Functions:

B. Read-Only Memory (ROM)

It is used to store important information which is used to operate the system. As its name refers to read-only memory, we can only read the programs and data stored on it. It is also a primary memory unit of the computer system. It is also known as permanent memory.



Parts of a Computer and Their Functions:

C. hard disk drive (HDD)

All primary computer hard drives are found inside a computer case and are attached to the computer motherboard. Used to store data permanently.

Parts of a Computer and Their Functions:

3. Motherboard

The **motherboard** is a crucial circuit board that connects all the **components of a computer system**, allowing them to communicate and work together seamlessly.

Parts of a Computer and Their Functions:

4. Power Supply Unit (PSU)

The **Power Supply Unit (PSU)** is a crucial component of any computer, responsible for converting the electricity from wall outlet into the specific voltages needed by the internal components of the system.

Parts of a Computer and Their Functions:

5. Input Devices (Keyboard, Mouse, etc.)

Input devices are essential peripherals that allow you to interact with your computer, sending commands and data to the system. The most common input devices are the **keyboard** and **mouse**, but there are several other devices that can enhance user interaction.

Parts of a Computer and Their Functions:

6. Output Devices (Monitor, Printer)

Output devices are peripherals that allow your computer to display the results of its processing, translating digital data into a form that you can see, hear, or interact with. The most common output devices are **monitors** and **printers**, but there are various other devices designed for specific types of output, such as projectors and speakers

Parts of a Computer and Their Functions:

7. Computer Port :

is a point of connection between the computer and its peripheral devices. The main function of the computer ports is to act as a point of attachment, where the cable from the peripheral can be plugged in and allows data to flow from and to the device.

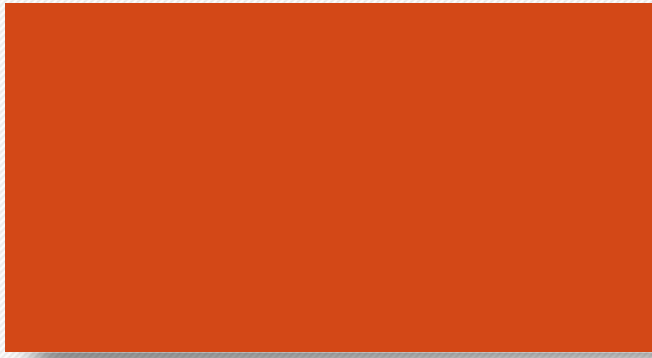
Personal computer:

is designed for portability with "clamshell" design, where the keyboard and computer components are on one panel, with a hinged second panel containing a flat display screen. There are many types of personal computers (laptop, tablet, smartphones, etc.)

Resources:

F. Faggin, The Making of the First Microprocessor, IEEE Solid-State Circuits Magazine, Winter 2009, IEEE Xplore.

Thanks for your listening



Computer Troubleshooting

Lecture 3

by

Habeeb Sameer

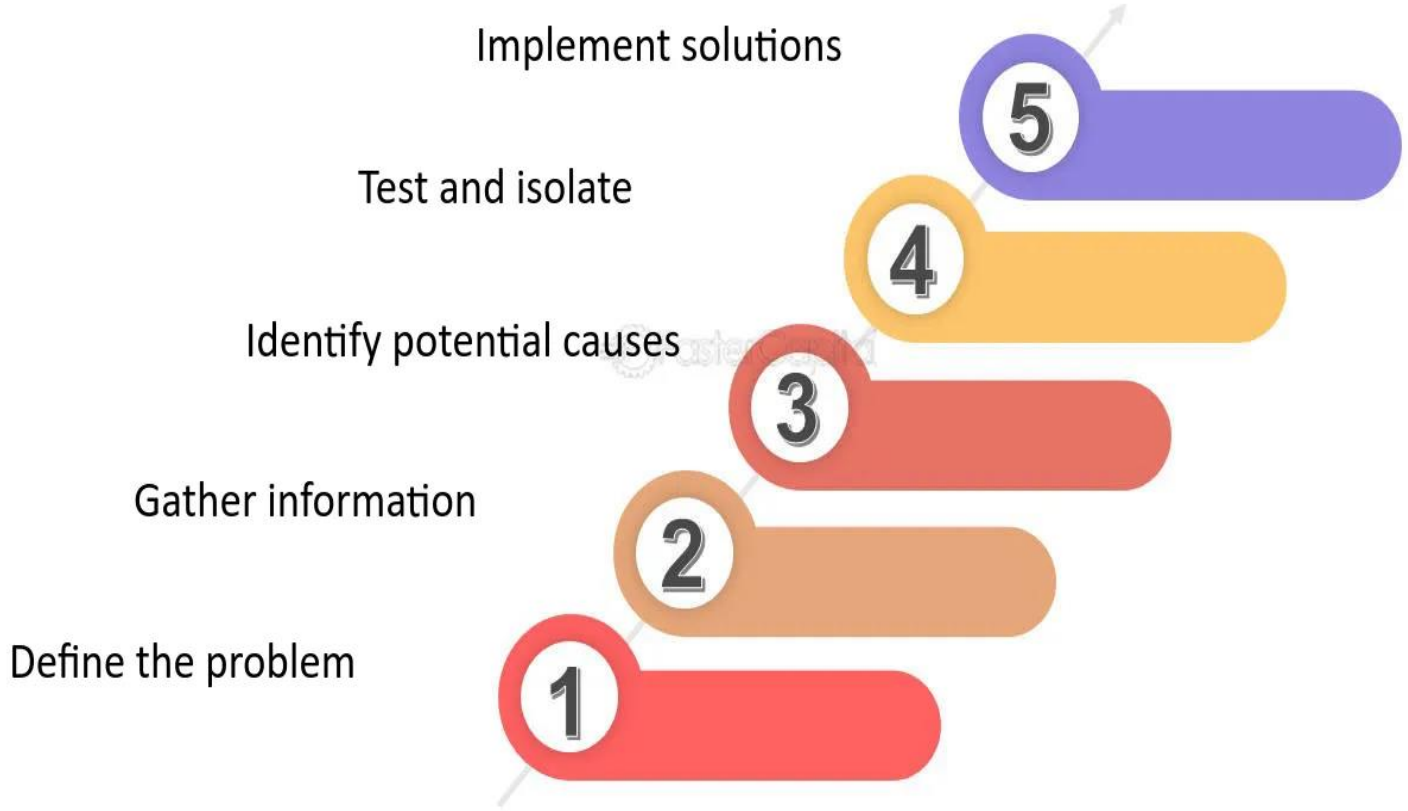
Computer Troubleshooting

is the process of figuring out how to solve a computer problem. Even with the most updated software and hardware, occasionally computers can malfunction.

planning to solve a problem

- 1. must figure out which part of the system is malfunctioning.
- 2. need to check each component of the computer, unless it is obvious
- where the problem is coming from.
- 3. Isolating the problem will help you solve the problem quickly.
- 4. Knowing how to solve these problems with a shortcut perhaps using only
- a few keys on the keyboard can save time and effort.
- 5. Backing up your important computer files to another source will ensure that if your problem cannot be corrected, you will still have a safe copy of your information

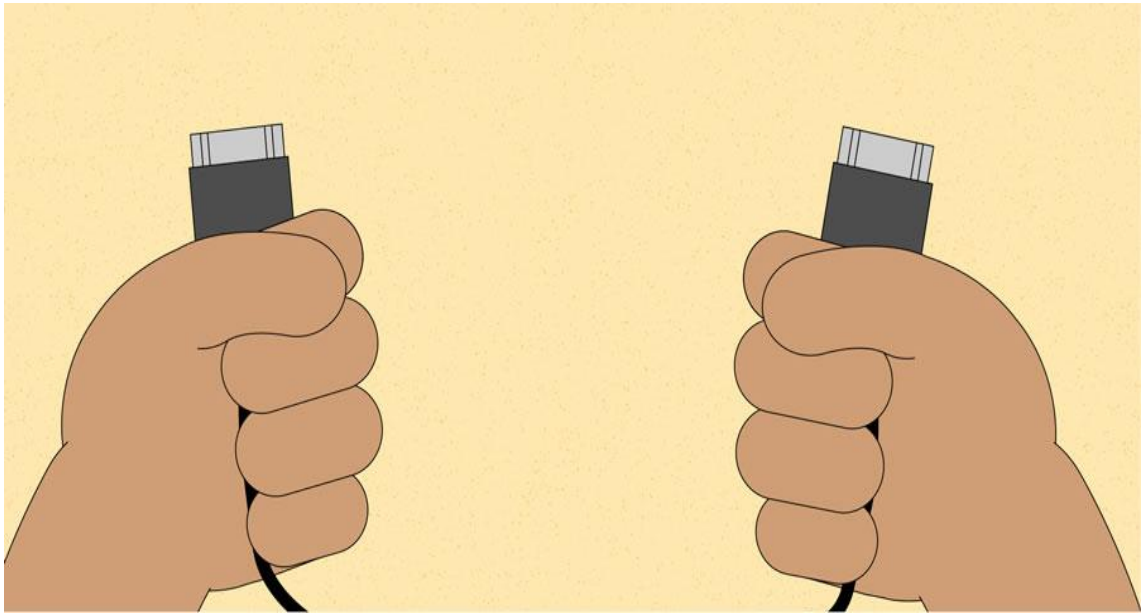
Step-by-Step Troubleshooting Process



basic troubleshooting techniques

- we'll show you some simple things to try when troubleshooting, as well as how to solve common problems you may encounter.
- **Write down your steps**: Once you start troubleshooting, you may want to **write down** each step you take. This way, you'll be able to remember exactly what you've done and can avoid repeating the same mistakes. If you end up asking other people for help, it will be much easier if they know exactly what you've tried already.
- **Take notes about error messages**: If your computer gives you an **error message**, be sure to write down as much information as possible. You may be able to use this information later to find out if other people are having the same error.

- **Always check the cables**: If you're having trouble with a specific piece of computer **hardware**, such as your monitor or keyboard, an easy first step is to check all related cables to make sure they're properly connected.



- **Restart the computer**: When all else fails, **restarting the computer** is a good thing to try. This can solve a lot of basic issues you may experience with your computer.

Common Technology Issues

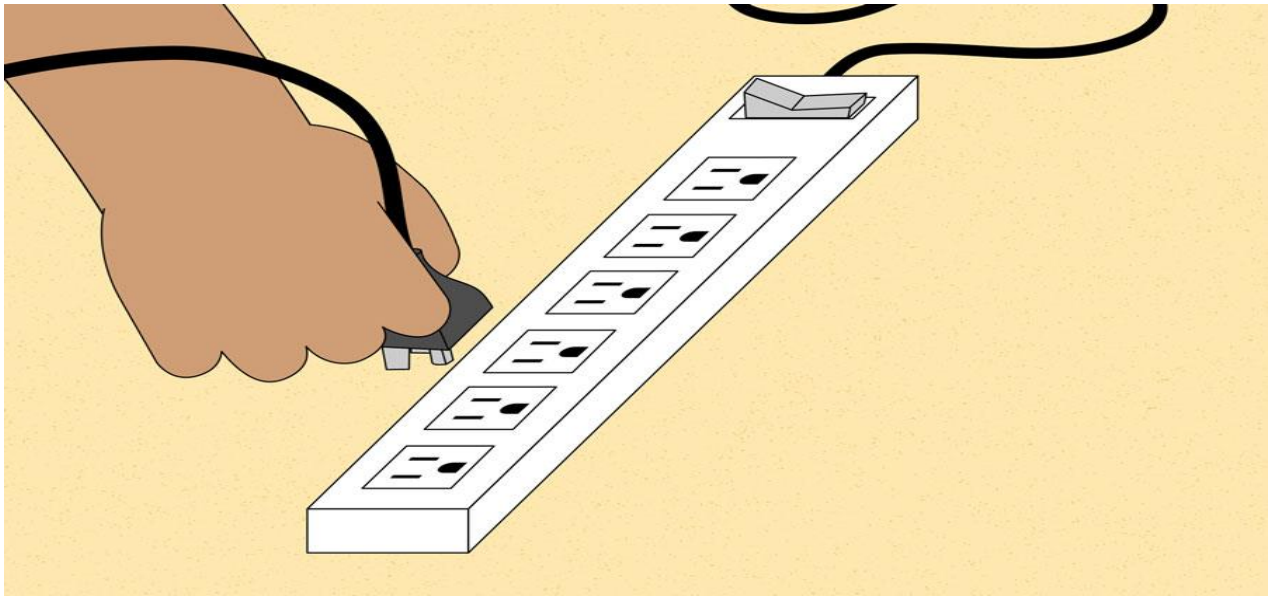
1. The printer is not working.
2. The computer is frozen.
3. A program is not responding.
4. The keyboard is not working.
5. New hardware or software is working incorrectly.
6. The mouse is not working.
7. The computer is slow.

Simple solutions to common problems

Most of the time, problems can be fixed using simple troubleshooting techniques, like **closing** and **reopening** the program. It's important to try these simple solutions before resorting to more extreme measures. If the problem still isn't fixed, you can try other troubleshooting techniques.

Problem: Power button will not start computer

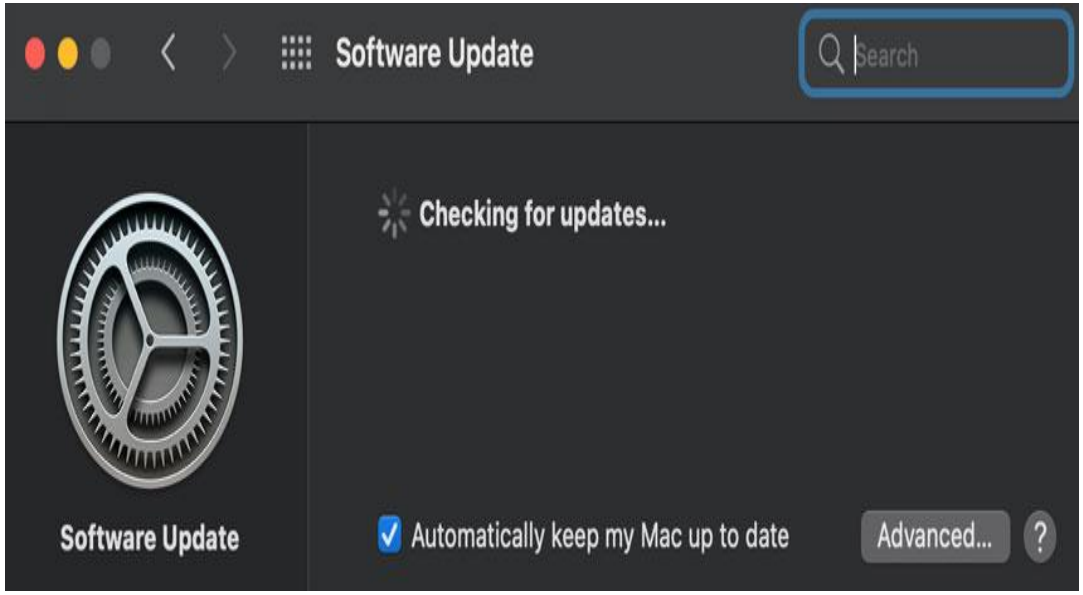
- **Solution 1**: If your computer **does not start**, begin by checking the power cord to confirm that it is plugged securely into the back of the computer case and the power outlet.
- **Solution 2**: If it is plugged into an outlet, make sure it is a **working outlet**. To check your outlet, you can plug in another **electrical device**, such as a lamp**.**
- **Solution 3**: If the computer is plugged in to a **surge protector**, verify that it is turned on. You may have to **reset** the surge protector by turning it off and then back on. You can also plug a lamp or other device into the surge protector to verify that it's working correctly.



- **Solution 4**: If you are using a **laptop**, the **battery** may not be charged. Plug the **AC adapter** into the wall, then try to turn on the laptop. If it still doesn't start up, you may need to wait a few minutes and try again.

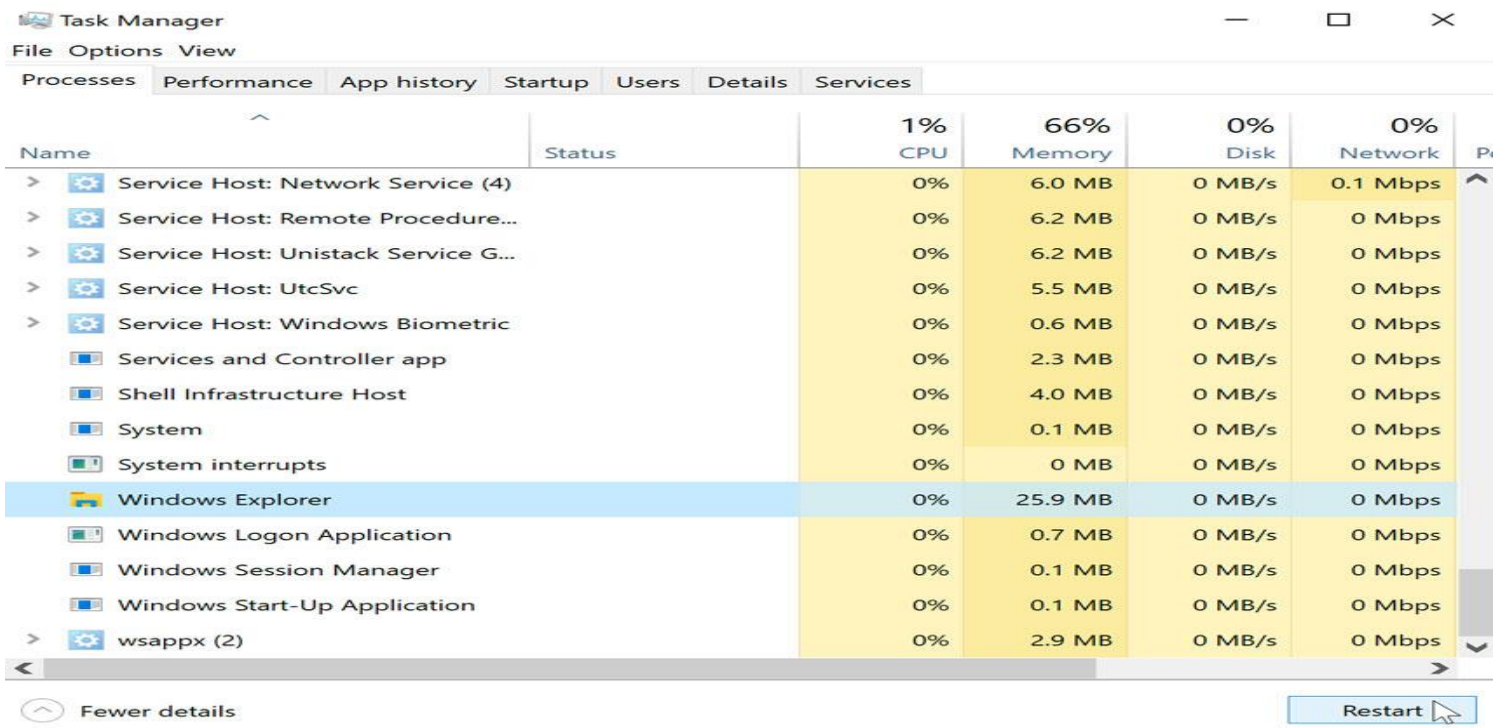
Problem: An application is running slowly

- **Solution 1**: Close and reopen the application.
- **Solution 2**: Update the application. To do this, click the **Help** menu and look for an option to check for **Updates**. If you don't find this option, another idea is to run an online search for application updates.

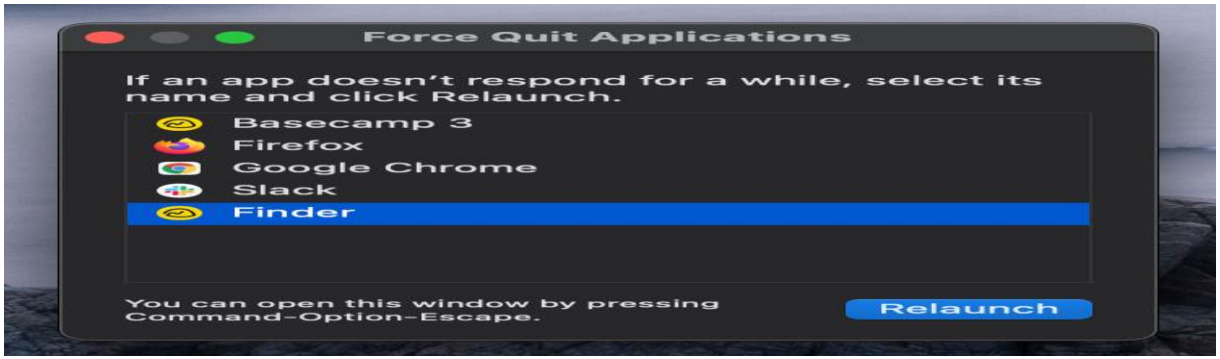


Problem: An application is frozen

- **Solution 1 (Windows only)**: Restart Windows Explorer. To do this, press and hold **Ctrl+Alt+Delete** on your keyboard to open the **Task Manager**. Next, locate and select **Windows Explorer** from the **Processes** tab and click **Restart**. You may need to click **More Details** at the bottom of the window to see the Processes tab.



- **Solution 2 (Mac only):** Restart Finder. To do this, press and hold **Command+Option+Esc** on your keyboard to open the **Force Quit Applications** dialog box. Next, locate and select **Finder**, then click **Relaunch**.



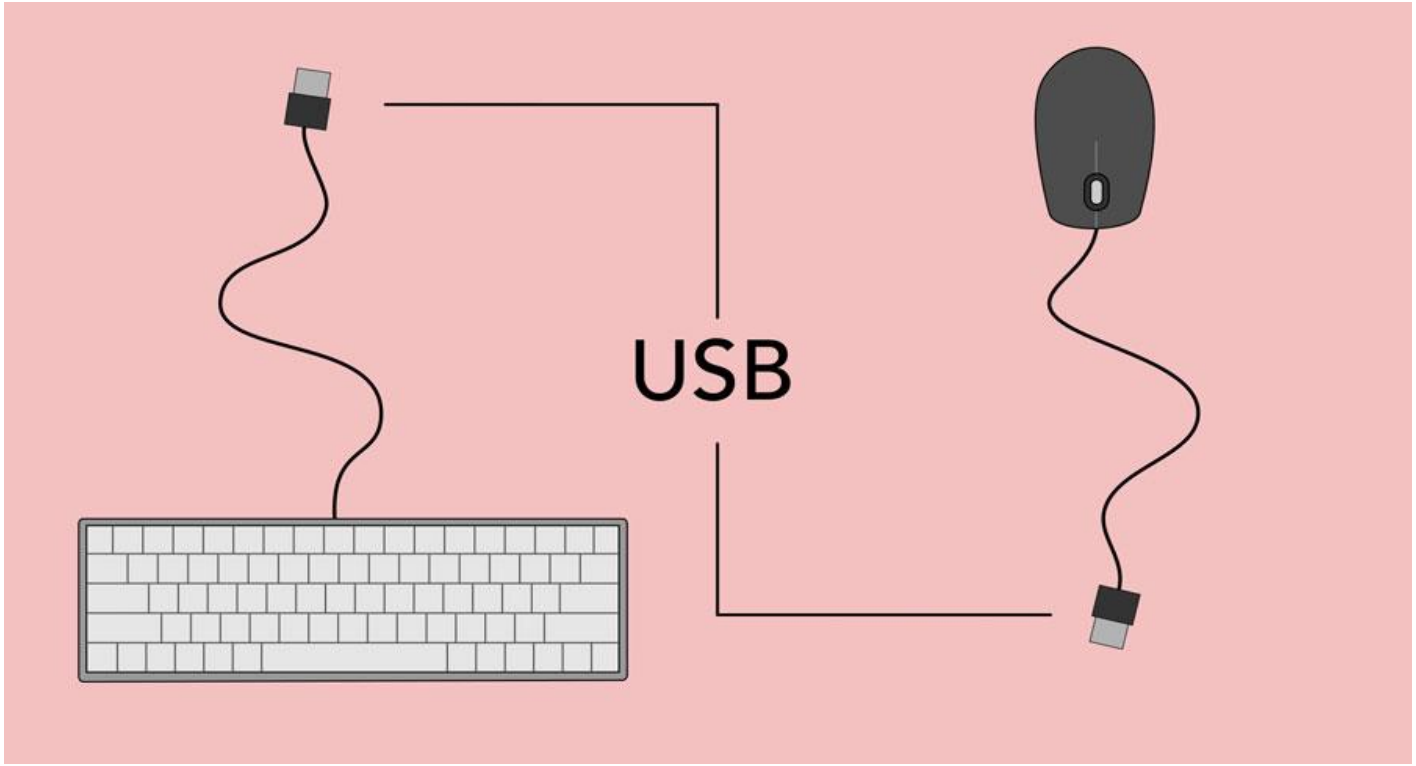
- **Solution 3**: Press and hold the Power button. The Power button is usually located on the front or side of the computer, typically indicated by the **power symbol**. Press and hold the Power button for **5 to 10 seconds** to force the computer to shut down.
- **Solution 4**: If the computer still won't shut down, you can **unplug the power cable** from the electrical outlet. If you're using a laptop, you may be able to remove the battery to force the computer to turn off. **Note**: This solution should be your **last resort** after trying the other suggestions above.

Problem: All programs on the computer run slowly

- **Solution 1**: Run a **virus scanner**. You may have **malware** running in the background that is slowing things down.
- **Solution 2**: Your computer may be running out of hard drive space. Try **deleting** any files or programs you don't need.
- **Solution 3**: If you're using a **PC**, you can run **Disk Defragmenter**. To learn more about **Disk Defragmenter**, check out our lesson on **Protecting Your Computer**.

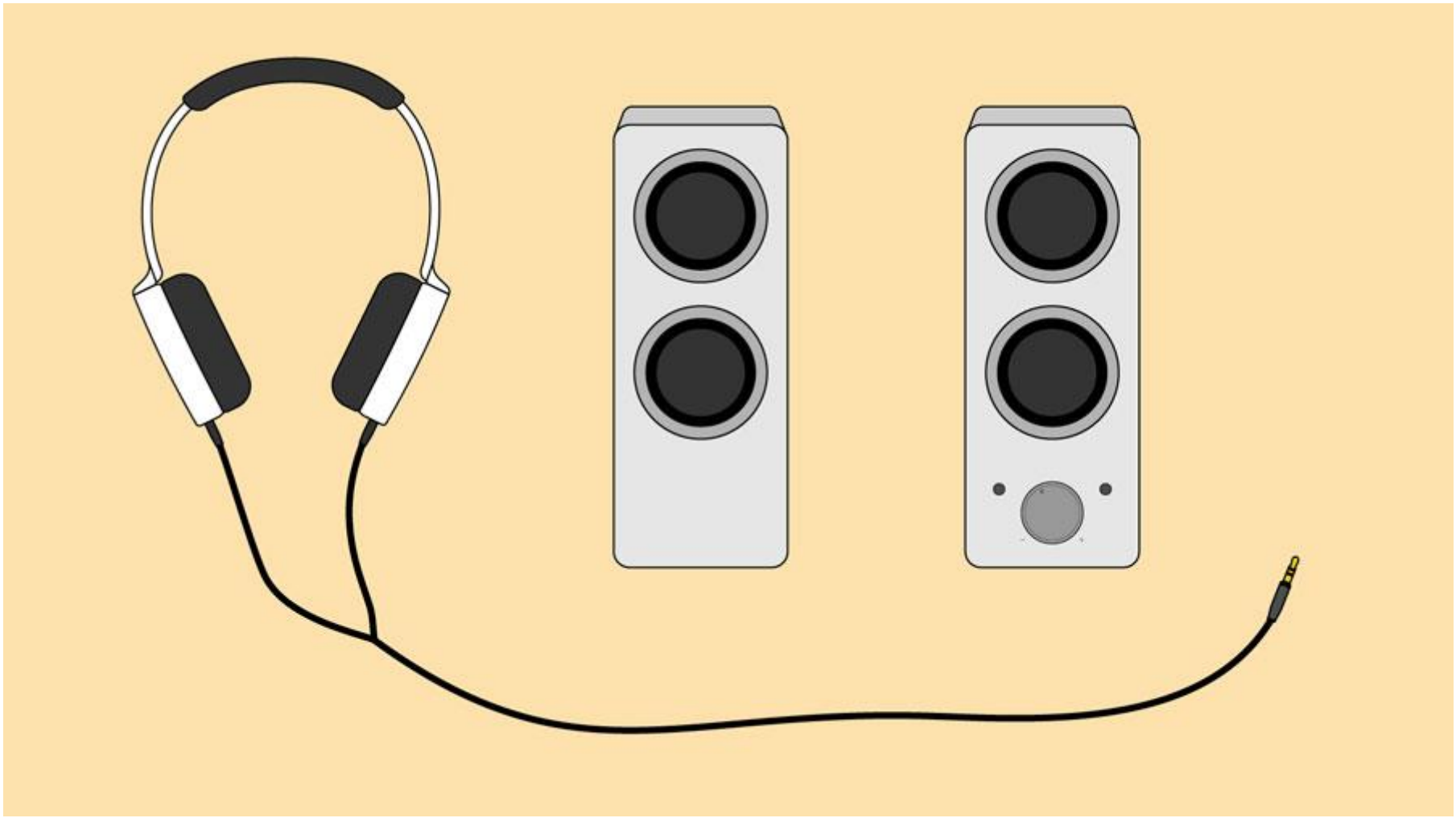
Problem: The mouse or keyboard has stopped working

- **Solution 1**: If you're using a **wired** mouse or keyboard, make sure it's correctly plugged into the computer.
- **Solution 2**: If you're using a **wireless** mouse or keyboard, make sure it's turned on and that its batteries are charged.



Problem: The sound isn't working

- **Solution 1**: Check the volume level. Click the audio button in the top-right or bottom-right corner of the screen to make sure the sound is turned on and that the volume is up.
- **Solution 2**: Check the audio player controls. Many audio and video players will have their own separate audio controls. Make sure the sound is turned on and that the volume is turned up in the player.
- **Solution 3**: Check the cables. Make sure external speakers are plugged in, turned on, and connected to the correct audio port or a USB port. If your computer has **color-coded** ports, the audio output port will usually be **green**.
- **Solution 4**: Connect headphones to the computer to find out if you can hear sound through the headphones.



Problem: The screen is blank

- **Solution 1**: The computer may be in **Sleep** mode. Click the mouse or press any key on the keyboard to wake it.
- **Solution 2**: Make sure the monitor is **plugged in** and **turned on**.
- **Solution 3**: Make sure the computer is **plugged in** and **turned on**.
- **Solution 4**: If you're using a desktop, make sure the monitor cable is properly connected to the computer tower and the monitor.

Problem : The printer is not working

- First, you check the printer to see that it's turned on and plugged in to the **surge protector**. It is, so that's not the issue. Next, you check to make sure the printer's **ink cartridge** still has ink and that there is paper loaded in the **paper tray**. Things look good in both cases, so you know the issue has nothing to do with ink or paper.
- Now you want to make sure the printer and computer are **communicating correctly**. If you recently downloaded an **update to your operating system**, it might interfere with the printer. But you know there haven't been any recent updates and the printer was working yesterday, so you'll have to look elsewhere.
- You check the printer's **USB cord** and find that it's not plugged in. You must have unplugged it accidentally when you plugged something else into the computer earlier. Once you plug in the USB cord, the printer starts working again. It looks like this printer issue is solved!
- This is just one example of an issue you might encounter while using a computer. In the rest of this lesson, we'll talk about other common computer problems and some ways to solve them.

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COMPUTER APPLICATIONS & AI

Lecture 5:
AI in Our Daily Life

By:
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Contents

Introduction

In this lecture, we will explore how AI influences our everyday routines, with a focus on AI in smartphones and virtual assistants such as Siri and Google Assistant. By the conclusion of this lecture, you will gain a comprehensive understanding of how these technologies operate, their various applications, and their broader implications.

Figure 1 Interaction of AI in our daily life

Outline

- What is AI?
- AI in Smartphones
- Virtual Assistants (Siri, Google Assistant, Alexa)
- Real-World Examples
- Ethical Considerations
- Q&A Session

What is AI?

AI is the simulation of human intelligence in machines, enabling them to perform tasks such as learning, reasoning, problem-solving, perception, and language understanding. It's integrated into various technologies we interact with daily.[1]

Examples:

- Self-driving cars
- Facial recognition
- Personalized recommendations on platforms like Netflix or Spotify

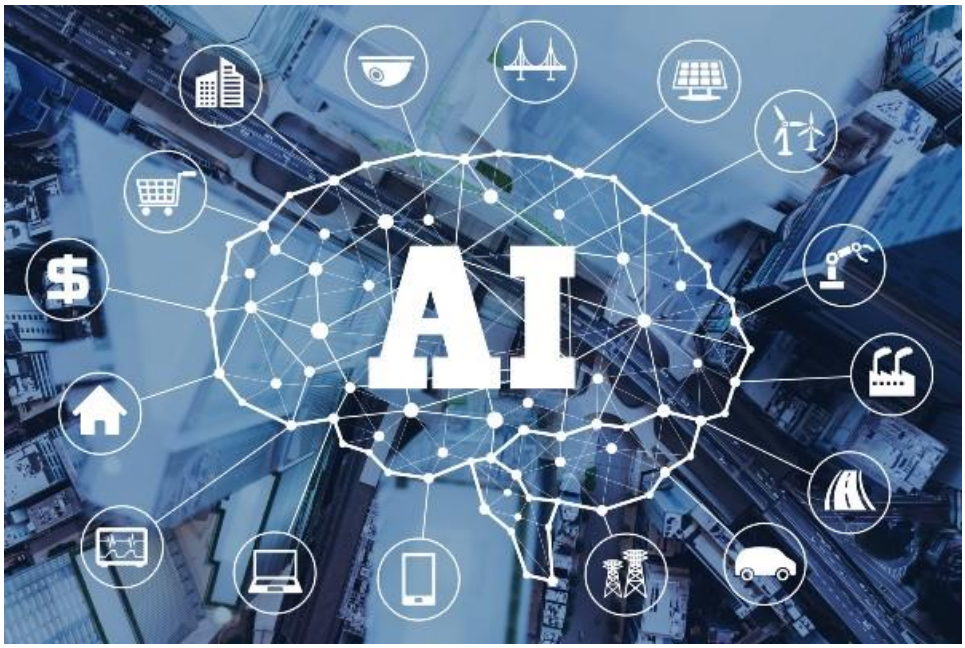


Figure 2 AI in Different areas

[1] Russell, S., & Norvig, P. (2016). *Artificial Intelligence: A Modern Approach*. Pearson.

AI in Smartphones

Smartphones are embedded with numerous AI-powered features that enhance user experience:

1. **Facial Recognition:** Used to unlock phones, ensuring security and privacy.

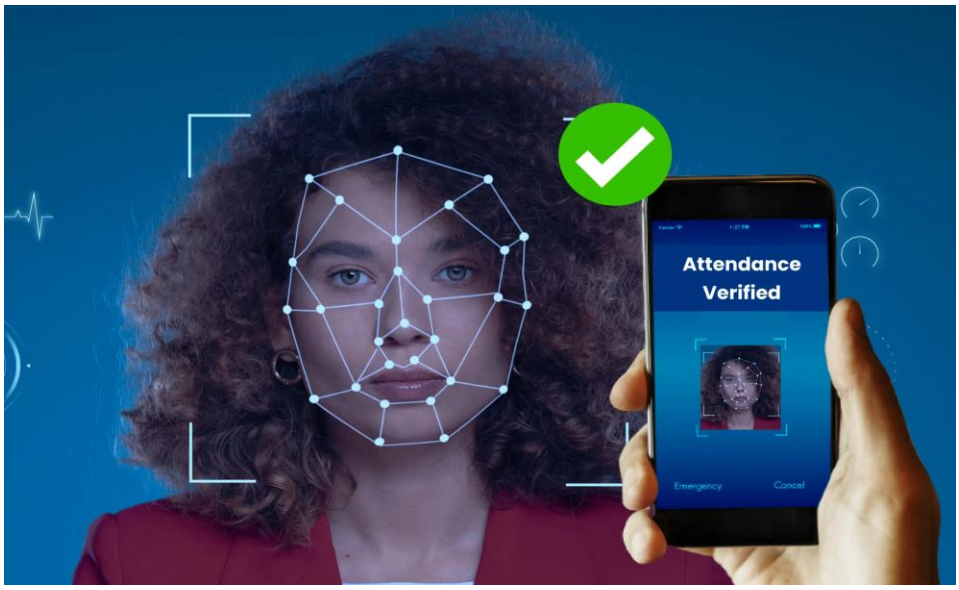


Figure 3 Facial recognition

Facial recognition technology uses artificial intelligence (AI) to identify or verify individuals based on their facial features. The process generally involves several steps:

a) **Face Detection**: The system locates and isolates faces within an image or video stream using algorithms like Haar cascades or deep learning models like Convolutional Neural Networks (CNNs).
b) **Face Alignment**: Detected faces are aligned to correct for variations in angle, scale, and orientation. This step ensures that facial landmarks (e.g., eyes, nose, mouth) are positioned consistently for better recognition.
c) **Feature Extraction**: The aligned face is processed to extract distinctive features using deep learning techniques such as CNNs or other specialized models like FaceNet or VGG-Face. These

features are converted into a numerical representation called an embedding.

d) **Face Matching**: The extracted features are compared with a database of known faces. A similarity score is computed to determine whether there's a match. Various methods like Euclidean distance or cosine similarity measure the closeness of these feature vectors.
e) **Classification and Decision**: Based on the similarity score and a predefined threshold, the system decides whether the face matches an identity in the database.

AI-based facial recognition systems continuously improve their accuracy using vast datasets and advanced deep learning algorithms, learning more about variations in facial features under different conditions (e.g., lighting, expressions, and angles).[2] [3] [4]

2. **Camera Optimization:** AI adjusts settings for optimal photos, recognizing scenes, faces, and objects.
   AI in smartphone cameras optimizes photography by automatically adjusting settings and enhancing image quality based on scene, face, and object recognition. Here's how it works:

   a) **Scene Recognition**: AI algorithms analyze the scene in real-time to identify elements like landscapes, portraits, night scenes, or food. The system then adjusts settings such as exposure, contrast, and color balance to suit the recognized scene, providing optimized results without manual input.

[2] Goodfellow, I., Bengio, Y., & Courville, A. (2016). *Deep Learning*. MIT Press.
[3] Li, S. Z., & Jain, A. K. (2011). *Handbook of Face Recognition*. Springer.
[4] Taigman, Y., Yang, M., Ranzato, M., & Wolf, L. (2014). DeepFace: Closing the gap to human-level performance in face verification. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*.

Figure 4 Scene and Objects Recognition

b) **Face and Object Recognition**: AI detects faces and objects within the frame, ensuring they are in focus and properly exposed. This technology also applies beauty filters, bokeh effects, or object tracking for enhanced photos and videos.
c) **Low-Light Enhancement**: AI reduces noise and brightens images taken in low-light environments by analyzing and processing multiple frames. This computational photography technique produces clearer and more detailed images.
d) **Image Stabilization**: AI compensates for hand movement by predicting and adjusting for motion, resulting in sharper images and smoother videos.
e) **Post-Processing Optimization**: AI algorithms enhance the captured image by adjusting colors, sharpness, and dynamic range. It learns user preferences over time to offer personalized photo enhancements.[5] [6] [7]

[5] Zhang, Y., Xu, Y., & Liu, H. (2021). *Smartphone Photography: Image Optimization with AI Technologies*. Wiley.
[6] Lim, K., & Tang, M. (2019). AI-powered image enhancement in mobile devices. *Journal of Computational Imaging*, 5(2), 78-89.
[7] Goodfellow, I., Bengio, Y., & Courville, A. (2016). *Deep Learning*. MIT Press.

3. **Predictive Text and Smart Replies:** AI learns from typing patterns and suggests words or responses to improve communication efficiency.[8]
   AI in smartphones enhances communication through **Predictive Text** and **Smart Replies** by analyzing typing patterns and context. AI models like recurrent neural networks (RNNs) and transformer-based architectures (e.g., GPT) learn from users' input history, predicting the next word or suggesting relevant responses based on the conversation's context. This process speeds up typing and offers accurate, context-aware suggestions, improving communication efficiency.[9] [10] [11]

Figure 5 How do phones use AI

[8] Goodfellow, I., Bengio, Y., & Courville, A. (2016). *Deep Learning*. MIT Press.
[9] Jurafsky, D., & Martin, J. H. (2023). *Speech and Language Processing*. Pearson
[10] Goodfellow, I., Bengio, Y., & Courville, A. (2016). *Deep Learning*. MIT Press.
[11] Brown, T. B., et al. (2020). Language models are few-shot learners. *Advances in Neural Information Processing Systems (NeurIPS)*.

Virtual Assistants: Siri, Google Assistant, Alexa

Virtual assistants are one of the most visible applications of AI in daily life. These assistants perform tasks like setting reminders, sending messages, and even controlling smart home devices.

1. **Siri (Apple):** Uses natural language processing (NLP) to understand and respond to user commands.
2. **Google Assistant:** Integrates with Google services for personalized information.
3. **Alexa (Amazon):** Manages smart home ecosystems, enabling voice-controlled lighting, thermostats, and security systems.[12]

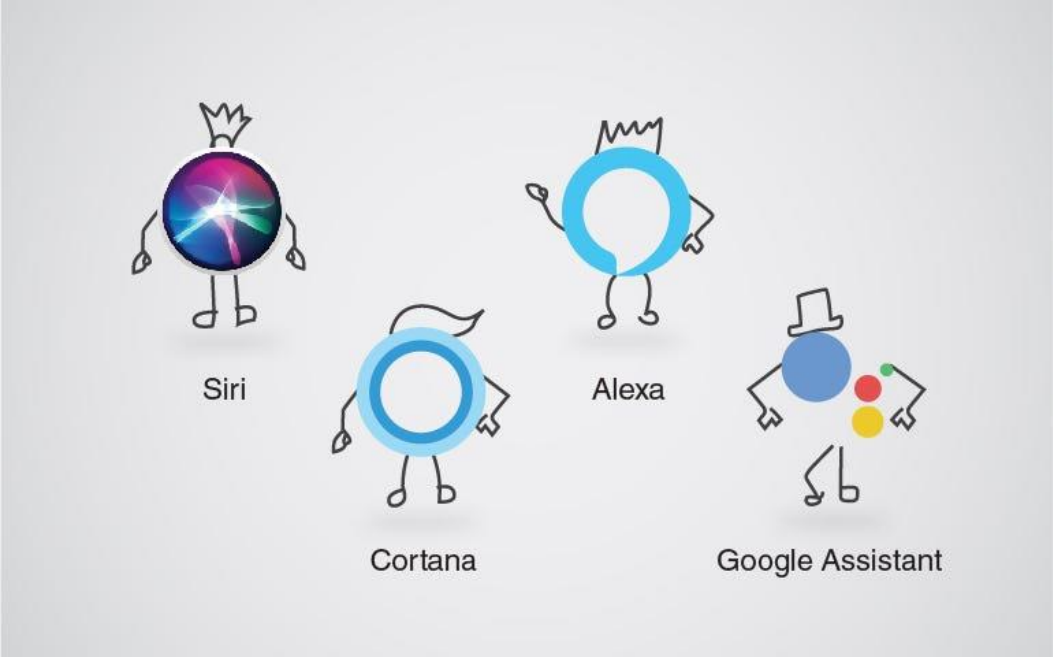


Figure 6 Virtual Assistants in Modern Smartphones

[12] Gunkel, D. J. (2018). *The Machine Question: Critical Perspectives on AI, Robots, and Ethics*. MIT Press.

Real-World Examples

1. **Navigation & Maps**: AI in Google Maps, Waze and Yandex predicts traffic patterns and suggests optimal routes.

AI in smartphone navigation apps like **Google Maps**, **Waze**, and **Yandex** analyzes real-time traffic data and historical patterns to predict congestion and suggest optimal routes. Machine learning algorithms process information from various sources, such as GPS data, user reports, and road conditions, to provide accurate travel times and efficient navigation options, enhancing the overall user experience.[13]

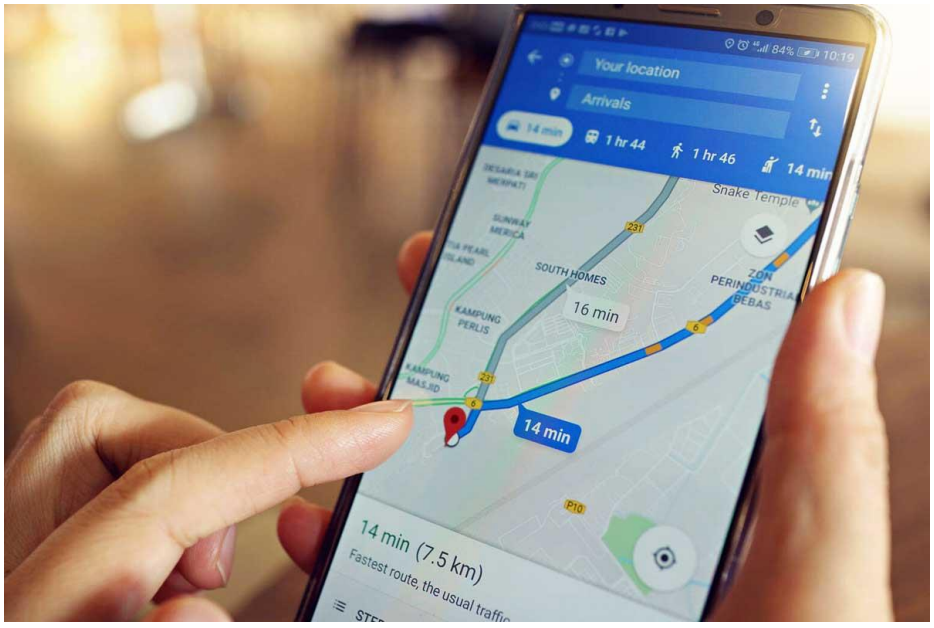


Figure 7 Navigation systems

[13] Russakovsky, O., et al. (2015). ImageNet Large Scale Visual Recognition Challenge. *International Journal of Computer Vision*, 115(3), 211-252.

2. **Health Monitoring**: AI-powered apps on smartphones track health metrics like heart rate, sleep patterns, and physical activity, promoting healthier lifestyles.

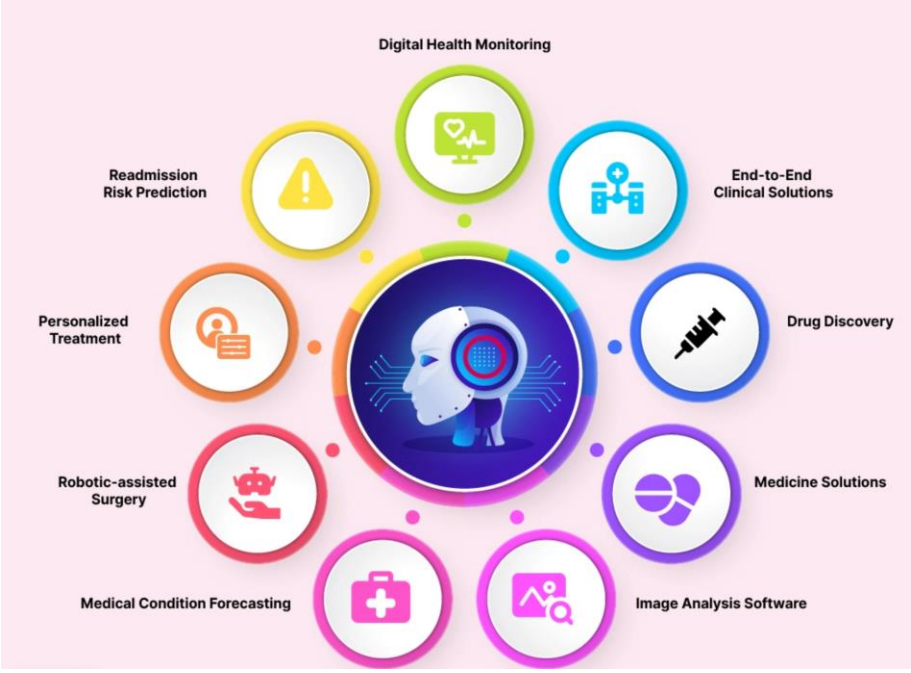


Figure 8 Health monitoring by AI

AI in smartphones enables health monitoring by tracking metrics like heart rate, sleep patterns, and physical activity through AI-powered apps and sensors. These apps analyze data in real-time, providing personalized insights and recommendations to promote healthier lifestyles. Machine learning algorithms identify patterns and offer users tips for improving their well-being. [14] [15]

[14] Li, X., & Tao, Q. (2021). AI-based health monitoring applications in mobile devices. *Journal of Healthcare Engineering*, 8, 102-118.
[15] Topol, E. (2019). *Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again*. Basic Books.

3. **Translation Tools**: AI in tools like Google Translate allows for real-time translation, breaking down language barriers.[16]

   AI in smartphone translation tools, like **Google Translate** and **Microsoft Translator**, uses neural machine translation (NMT) models to provide real-time translations. These models understand the context and nuances of language, offering accurate translations for text, speech, and images. AI also enables offline translation and language learning, enhancing accessibility and communication across languages. [17] [18]

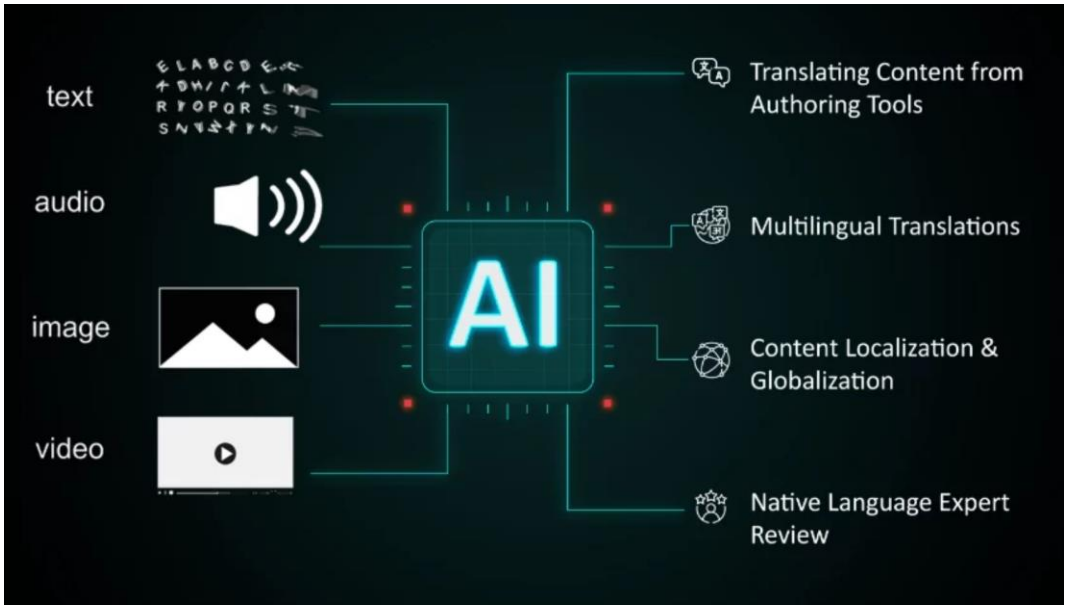


Figure 9 AI in Translation

[16] Brynjolfsson, E., & McAfee, A. (2014). *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*. W.W. Norton & Company.
[17] Wu, Y., et al. (2016). Google's Neural Machine Translation System: Bridging the Gap between Human and Machine Translation. *arXiv preprint arXiv:1609.08144*.
[18] Jurafsky, D., & Martin, J. H. (2023). *Speech and Language Processing*. Pearson.

Ethical Considerations:

While AI in smartphones and virtual assistants brings convenience, it also raises ethical concerns:

- **Privacy Issues**: Data collection and storage by tech companies can potentially infringe on user privacy.
- **Bias and Fairness**: AI systems may develop biases based on the data they are trained on, affecting their decision-making.
- **Dependence on Technology**: Increased reliance on AI tools might impact cognitive skills and independence.[19]

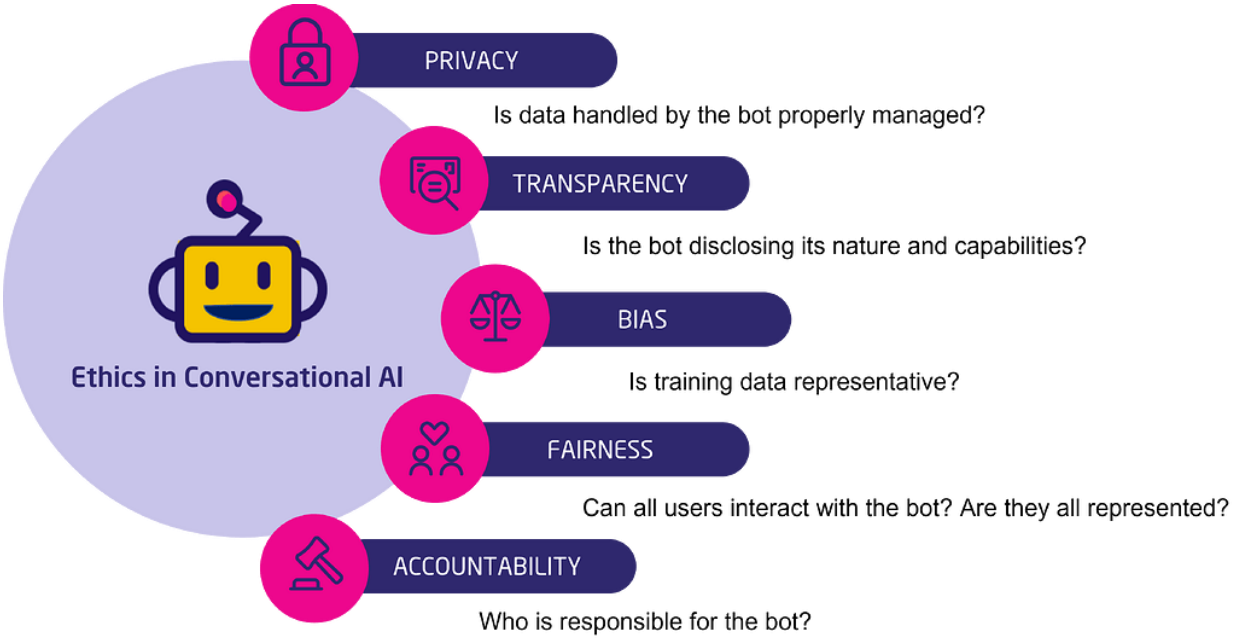


Figure 10 Ethical Considerations in Conversational AI

[19] Bostrom, N. (2014). *Superintelligence: Paths, Dangers, Strategies*. Oxford University Press.

Q&A Session

- What other AI features do you use daily?
- How do you feel about privacy when using AI-enabled devices?
- Do you trust AI with sensitive information, such as health data?

Conclusion

AI is transforming how we interact with technology, making our lives more convenient and efficient. Smartphones and virtual assistants are just the beginning, with AI continuing to evolve and integrate into more aspects of our lives. Staying informed and understanding the benefits and risks of AI will help us navigate its future.

Still have questions?

Feel free to ask me at yas.mf@ya.ru

Lecture 2

E-commerce and electronic banking services

By: Assistant Lecturer Doaa Talib Zaidan

- Contents :

- E-commerce Concept
- Types of e-commerce
- Electronic Banking Services
- Online Banking
- ATM Services
- Undebit Card Services
- Phone Banking
- SMS Banking
- Electronic Airlines Services
- Mobile Banking

Introduction to E-commerce Concept

1. E-commerce: It is the process of buying and selling goods and services or exchanging commercial information using the Internet.

- The importance of e-commerce: How it has revolutionized the way business is done by providing greater access to global markets and reducing operating costs.

Types of e-commerce:

- B2B business-to-business
- B2C business-to-consumer
- C2C from consumer to consumer
- C2B consumer to business
- C2A from consumer to management
- B2A Business Administration

There are 6 basic types of e-commerce:

1. Business - to- Business (B2B)

Business-to-Business (B2B) e-commerce encompasses all electronic transactions of goods or services conducted between companies. Producers and traditional commerce wholesalers typically operate with this type of electronic commerce.

2. Business- to - Consumer (B2C)

The Business-to-Consumer type of e-commerce is distinguished by the establishment of electronic business relationships between businesses and final consumers. It corresponds to the retail section of e-commerce, where traditional retail trade normally operates.

3. Consumer-to-Consumer (C2C)

Consumer-to-Consumer (C2C) type e-commerce encompasses all electronic transactions of goods or services conducted between consumers. Generally, these transactions are conducted through a third party, which provides the online platform where the transactions are actually carried out.

4. Consumer-to-Business (C2B)

In C2B there is a complete reversal of the traditional sense of exchanging goods. This type of e-commerce is very common in crowdsourcing based projects. A large number of individuals make their services or products available for purchase for companies seeking precisely these types of services or products.

5. Business-to-Administration (B2A)

This part of e-commerce encompasses all transactions conducted online between companies and public administration. This is an area that involves a large amount and a variety of services, particularly in areas such as fiscal, social security, employment, legal documents and registers, etc. These types of services have increased considerably in recent years with investments made in e-government.

6. Consumer-to-Administration (C2A)

The Consumer-to-Administration model encompasses all electronic transactions conducted between individuals and public administration.

Examples of applications include:

- Education – disseminating information, distance learning, etc.
- Social Security – through the distribution of information, making payments, etc.
- Taxes – filing tax returns, payments, etc.
- Health – appointments, information about illnesses, payment of health services, etc.

Both models involving Public Administration (B2A and C2A) are strongly associated to the idea of efficiency and easy usability of the services provided to citizens by the government, with the support of information and communication technologies.

2. Electronic Banking Services

•The concept of electronic banking services: a group of financial services provided by banks via digital media to facilitate access to bank accounts and conduct banking operations.

3. Online Banking

•Definition of online banking: It is the use of the Internet to access banking services and conduct transactions from anywhere and at any time.

•Advantages: ease, convenience, speed of implementation, and accessibility 24/7.

•Examples of operations: money transfer, bill payment, balance inquiry.

4. Banking via ATM Services

Definition of automated teller machines (ATM): Banking devices that allow customers to perform basic banking operations such as withdrawals, deposits, and balance inquiries without the need to visit the branch.

•The importance of ATMs: providing service around the clock and reducing the burden on banking branches.

5. Undebit Card Services

•Definition of non-debit cards: includes prepaid cards and credit cards that do not withdraw directly from the customer’s balance.

•The difference between non-debit cards and direct debit cards: how each type works and when it is best to use it.

6. Phone Banking

•Definition of telephone banking: the ability to conduct banking operations using the telephone by contacting customer service or using an automated response.
•Benefits: Fast and easy access to basic operations such as balance inquiries or money transfers.

7. SMS Banking

•Definition of text message banking: The use of text messages to send and receive banking information or to carry out simple operations.
•Examples of uses: Balance alerts, transaction notifications, account inquiries.

8. Electronic Airlines Services)

•The concept of aviation electronic services: using technology to purchase and book airline tickets and manage travel reservations via the Internet.
•Advantages: saving time and effort, access to promotional offers, and the ability to change reservations easily.

9. Mobile Banking

Mobile Banking: Applications and services that allow users to conduct their banking transactions via mobile devices such as smartphones and tablets.

•Main functions: transfer money, pay bills, view accounts, and manage personal finances.

The importance of security: protecting banking data and emphasizing the use of encryption and complex passwords.

Comparison between e-commerce and traditional commerce

•E-commerce:

•It takes place entirely online and includes digital buying and selling.

•Provides 24/7 global access.

•Requires lower operating costs because there is no need for a physical location.

•It enjoys fast implementation and electronic handling of transactions.

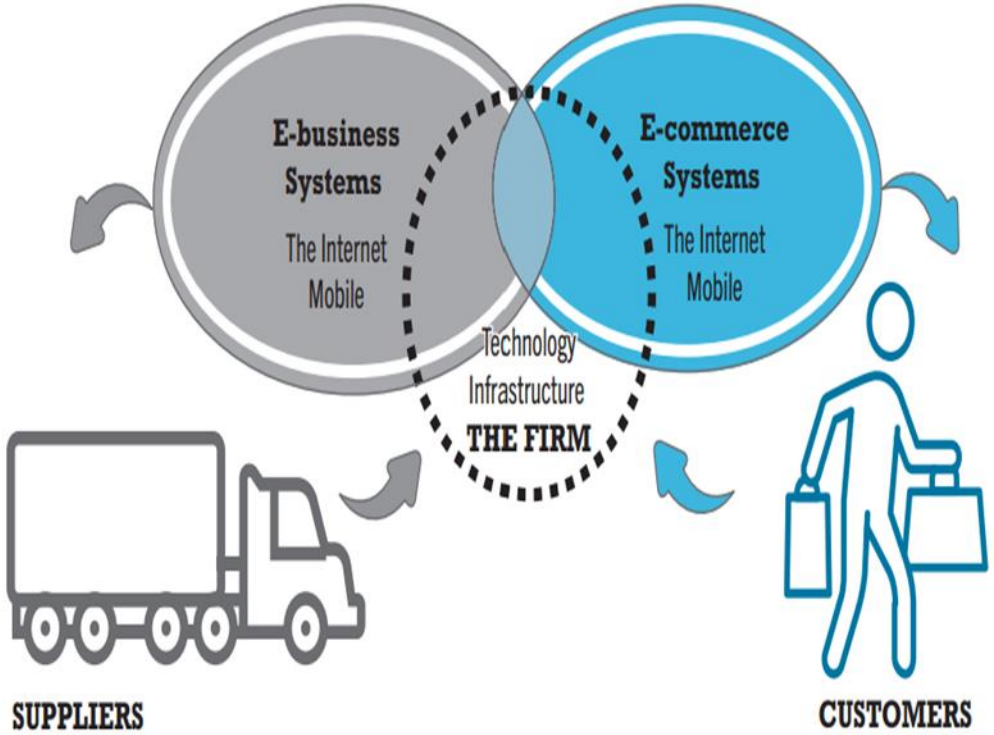
Traditional trade:

•It takes place in physical locations such as stores and markets.

•It relies on personal contact with customers and face-to-face negotiations.

•Needs higher operating costs due to rent and logistical expenses.

•Requires longer time to complete transactions due to traditional procedures.



Benefits of E-commerce

Benefits of E-commerce to Organizations

1. International marketplace

What used to be a single physical marketplace located in a geographical area has now become a borderless marketplace including national and international markets. By becoming e-commerce enabled, businesses now have access to people all around the world.

2. Operational cost saving

The cost of creating, processing, distributing, storing and retrieving paper-based information has decreased.

3. Mass customization

E-commerce has revolutionized the way consumers buy products and services. Now customers can configure a product according to their specifications within minutes on-line via the website.

4. No time constraints

Businesses can be contacted by at any time.

Benefits of E-commerce

Benefits of E-commerce to Consumers

1. **24/7 access**

Enables customers to shop or conduct other transactions 24 hours a day, all year round from almost any location.

2. **More choices**

Customers not only have a whole range of products that they can choose from and customize, but also an international selection of suppliers.

3. **Price comparisons**

Customers can 'shop' around the world and conduct comparisons directly by visiting different sites.

4. **Improved delivery processes**

This can range from the immediate delivery of digitized or electronic goods such as software or audio-visual files by downloading via the Internet, to the on-line tracking of the progress of packages being delivered.

5. **An environment of competition**

Where substantial discounts can be found or value added, there are different retailers for customers.

Disadvantages of e-commerce

The main disadvantages associated with e-commerce are the following:

- Strong dependence on information and communication technologies (ICT);
- Lack of legislation that adequately regulates the new e-commerce activities, both nationally and internationally;
- Market culture is averse to electronic commerce (customers cannot touch or try the products);
- The users' loss of privacy, the loss of regions' and countries' cultural and economic identity;
- Insecurity in the conduct of online business transactions.

10. Conclusion and conclusions

The future of e-commerce and e-banking: How are these technologies expected to develop in the future.

•The impact of technological developments on these fields: such as artificial intelligence, the Internet of Things, and blockchain technology.

Benefits of using artificial intelligence in e-commerce:

Increase sales: AI can help companies increase sales by providing personalized product recommendations, improving customer service, and reducing fraud.

Improve customer satisfaction: AI can help businesses improve customer satisfaction by providing a more personalized shopping experience and 24/7 customer support.

Streamlined operations: AI can help companies streamline operations by automating tasks such as fraud detection and optimizing logistics.

If you work in e-commerce, there are a number of ways you can start using AI:

Invest in AI-powered tools: There are a number of AI-powered tools that can help you with tasks like product recommendations, customer service, and fraud detection.

Hire AI experts: If you don't have the resources to invest in AI-powered tools, you can hire AI experts to help you implement AI solutions.

Partnering with AI companies: There are a number of AI companies that offer e-commerce solutions. You can partner with one of these companies to start using AI.
Artificial Intelligence is a powerful technology that has the potential to transform the e-commerce industry. If you are in the e-commerce business, you should be thinking about how you can start using AI to improve your business.

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3. “Bank 4.0: Banking Everywhere, Never at a Bank” by Brett King: Discusses how banks are transforming into the digital age and how modern technology is being used to deliver banking services.
4. Laudon ,k. c.,& Traver , C.G.(2021).E-commerce 2021-2022:business .technology .society.Pearson Education Limited .

Republic of Iraq
Ministry of Higher Education & Scientific Research

Introduction of AI

Assistant Lecturer : Sarah Kadhim Hwaidi

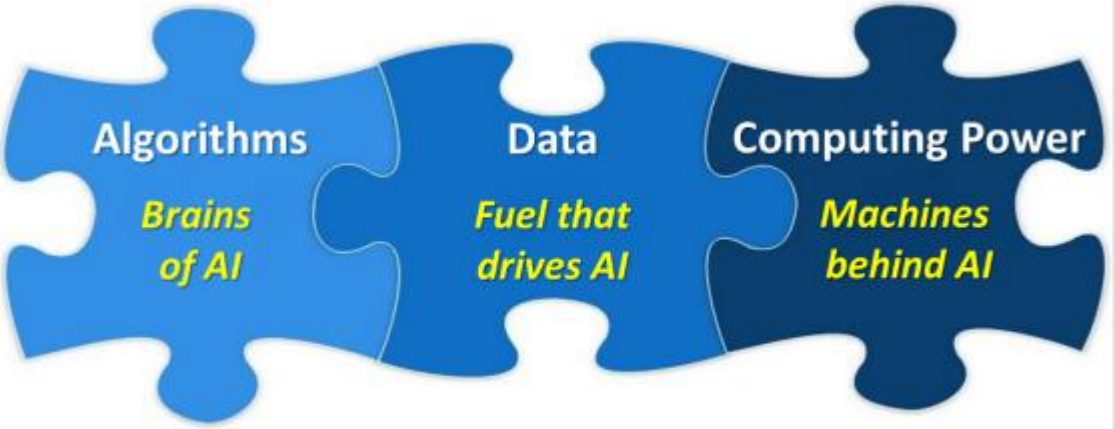
Contents :

Introduction

Definition of Artificial Intelligence**?**

One of the most important aspects of AI is that it is a multi-use technology. Like electricity, it can be applied in lots of different ways, to lots of different scenarios. There is no single, universally accepted definition for Artificial Intelligence, but the Oxford English Dictionary defines AI as **"the capacity of computers, or other machines, to exhibit intelligent behavior"**. This means AI systems appear to think, learn, and act like humans and in some cases exceed the capabilities of humans. AI systems can analyse vast amounts of data, solve complex problems, make decisions, and perform creative tasks Some AI

technologies have been around for more than 50 years, but advances in computing power, the availability of enormous quantities of data, and new developments in software algorithms have led to major AI breakthroughs in recent years.



Algorithms tell computers what to do. Data tells computers what to learn. Computing power gives machines the power to learn and make decisions

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History of Artificial Intelligence

Maturation of Artificial Intelligence (1943-1952)

- Year 1943: The first work which is now recognized as AI was done by
  Warren McCulloch and Walter Pits in 1943. They proposed a model of artificial neurons.

- Year 1949: Donald Hebb demonstrated an updating rule for modifying the connection strength between neurons. His rule is now called Hebbian learning.

- Year 1950: Alan Turing who was an English mathematician and pioneered Machine learning in 1950. Alan Turing publishes "Computing

  Machinery and Intelligence" in which he proposed a test. The test can check the machine's ability to exhibit intelligent behavior equivalent to human intelligence, called a Turing test.

The birth of Artificial Intelligence (1952-1956)

- Year 1955: An Allen Newell and Herbert A. Simon created the "first artificial intelligence program" Which was named "Logic Theorist". This

  program had proved 38 of 52 Mathematics theorems, and find new and more elegant proofs for some theorems.

- Year 1956: The word "Artificial Intelligence" was first adopted by American Computer scientist John McCarthy at the Dartmouth Conference. For the first time, AI was coined as an academic field.

  At that time high-level computer languages such as FORTRAN, LISP, or COBOL were invented. And the enthusiasm for AI was very high at that time.

The Golden years-Early enthusiasm (1956-1974)

- Year 1966: The researchers emphasized developing algorithms that can solve mathematical problems. Joseph Weizenbaum created the first chatbot in 1966, which was named ELIZA.

- Year 1972: The first intelligent humanoid robot was built in Japan which was named as WABOT-1.

The first AI winter (1974-1980)

- The duration between the years 1974 to 1980 was the first AI winter duration. AI winter refers to the time period when computer scientist dealt with a severe shortage of funding from the government for AI research.
- During AI winters, an interest in publicity on artificial intelligence was decreased.

A boom of AI (1980-1987)

- The year 1980: AI came back with "Expert System". Expert systems were programmed that emulate the decision-making ability of a human expert.
- In the Year 1980, the first national conference of the American Association of Artificial Intelligence was held at Stanford University.

The second AI winter (1987-1993)

- The duration between the years 1987 to 1993 was the second AI Winter duration.
- Again Investors and the government stopped in funding AI research due to high cost but not efficient results. The expert system such as XCON was very cost effective.

The emergence of intelligent agents (1993-2011)

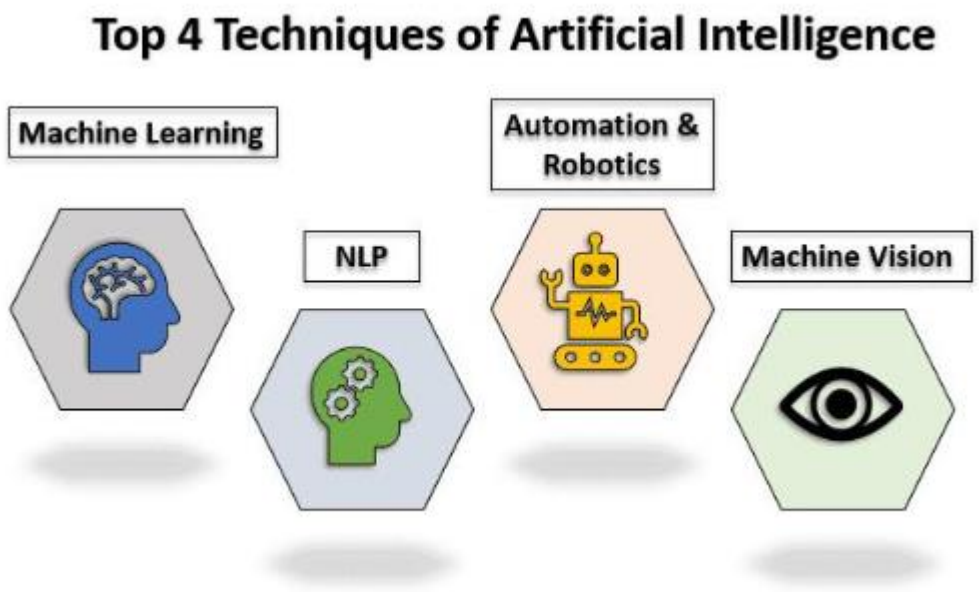
- Year 1997: In the year 1997, IBM Deep Blue beats world chess champion, Gary Kasparov, and became the first computer to beat a world chess champion.
- Year 2002: for the first time, AI entered the home in the form of Roomba, a vacuum cleaner.
- Year 2006: AI came in the Business world till the year 2006. Companies like Facebook, Twitter, and Netflix also started using AI.

Deep learning, big data, and artificial general intelligence (2011-present)

- Year 2011: In the year 2011, IBM's Watson won Jeopardy, a quiz show, where it had to solve complex questions as well as riddles. Watson had proved that they could understand natural language and could solve tricky questions quickly.
- Year 2012: Google has launched an Android app feature "Google Now", which was able to provide information to the user as a prediction.
- Year 2014: In the year 2014, Chatbot "Eugene Goostman" won a competition in the infamous "Turing test."
- Year 2018: The "Project Debater" from IBM debated on complex topics with two master debaters and also performed extremely well.

- Google has demonstrated an AI program "Duplex" which was a virtual assistant and that had taken a hairdresser appointment on call, and the lady on the other side didn't notice that she was talking with the machine. Now AI has developed to a remarkable level. The concepts of Deep learning, big data, and data science are now trending like a boom. Nowadays companies like Google, Facebook, IBM, and Amazon are working with AI and creating amazing devices. The future of Artificial Intelligence is inspiring and will come with high intelligence.

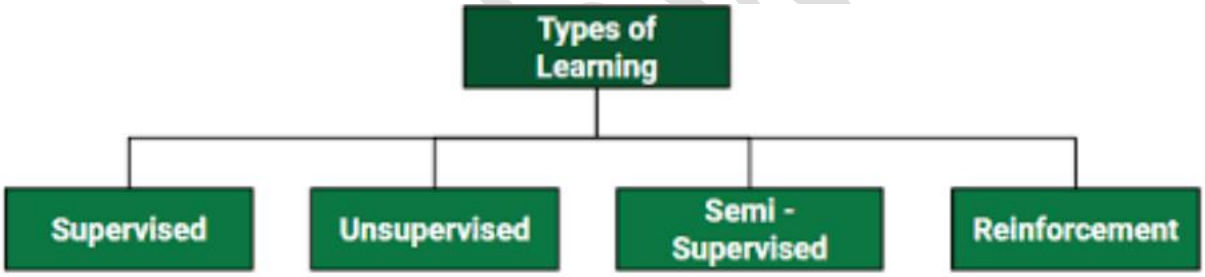
AI Techniques



Artificial intelligence techniques refer to a set of methods and algorithms used to develop intelligent systems that can perform tasks that require human-like intelligence. Among the most commonly used methods are:

- Machine Learning.
- Natural Language Processing.
- Machine Vision.
- Robotics.

Machine learning



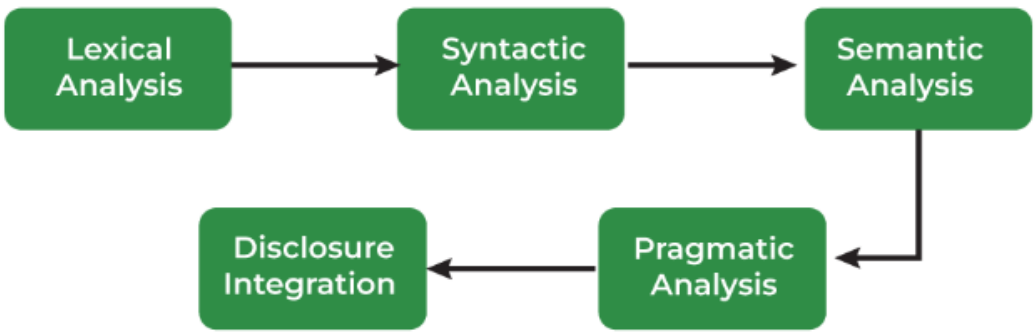
1. **Unsupervised machine learning** – AI systems analyze unlabeled data, where no pre-defined outcomes are provided. The goal is to uncover structures or patterns within the data without any prior knowledge. For example, they can aggregate similar customer behavior data to identify customer segments for targeted marketing strategies.
2. **Supervised learning** – A combination of an input dataset and an intended output is inferred from the training data. AI systems learn from a labeled dataset, where each data point is associated with a

known outcome. For example, this allows spam filters to distinguish spam from legitimate emails based on learned patterns.

3. **Semi-supervised learning -** It is a method that uses a small amount of labeled data and a large amount of unlabeled data to train a model. The goal of semi-supervised learning is to learn a function that can accurately predict the output variable based on the input variables, similar to supervised learning. However, unlike supervised learning, the algorithm is trained on a dataset that contains both labeled and unlabeled data.

4. **Reinforcement Learning** – In reinforcement learning, data is collected from machine learning systems that use trial and error to learn from the results and determine what action to take next. After each action, the algorithm receives feedback that helps it determine whether the choice it made was correct, neutral, or incorrect. It takes actions with the goal of maximizing rewards, or in other words, it learns by doing in order to achieve the best outcome.

Natural Language Processing



1. **Lexical integration** – Lexical analysis is the process of converting a string of characters into a string of symbols. Lexicographers are usually combined with parsers, which together analyze grammar in programming languages, web pages, etc.

2. **Syntactic Integration** – Syntactic analysis is the process of analyzing a string of symbols, whether in natural language, computer languages, or data structures, according to the rules of formal grammar.

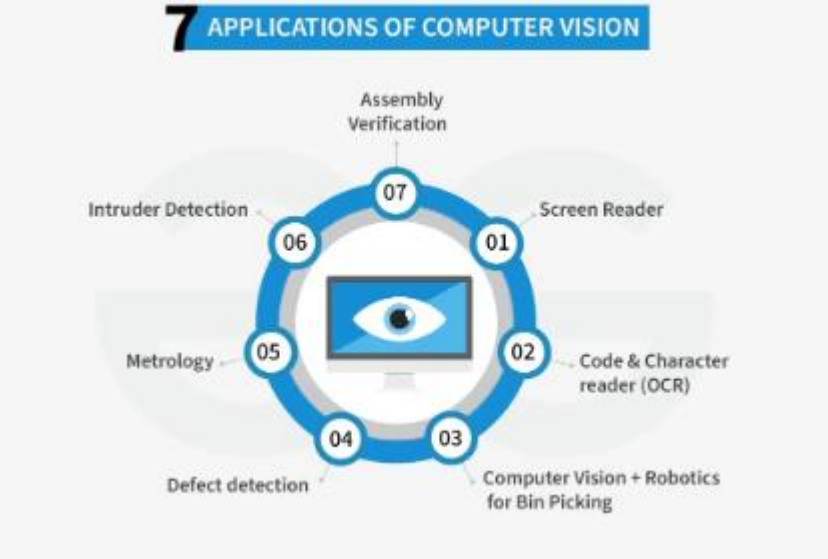
3. **Semantic Integration** – Semantic analysis attempts to understand the meaning of human language.

4. **Pragmatic Integration** – Pragmatic analysis is part of the process of extracting information from text. It focuses on taking an organized set of texts and finding out the actual meaning of the text. It also focuses on the meaning of words in time and context.

5. **Disclosure Integration -** Discourse analysis is used to uncover the motivation behind a text and is useful for studying the underlying meaning of a spoken or written text as it takes into account its social and historical contexts.

Machine Vision

Computer vision technology gives machines the ability to interpret visual information from the world. It has revolutionized industries such as healthcare, automotive, and robotics, enabling tasks such as facial recognition, object detection, and autonomous driving. How well it can distinguish between objects is a key component of computer vision technology.



Robotics and Automation

Automation aims to enable machines to perform boring and repetitive jobs, increasing productivity and delivering more effective, efficient and affordable results.

Challenges and Ethical Considerations

Here are common values associated with AI ethics and responsible AI:

Explainability and interpretability

As AI becomes more advanced, humans are challenged to comprehend and retrace how the algorithm came to a result. Explainable AI is a set of processes and methods that enables human users to interpret, comprehend and trust the results and output created by algorithms.

Fairness and inclusion

To encourage fairness, practitioners can try to minimize algorithmic bias across data collection and model design, and to build more diverse and inclusive teams.

Robustness and security

Robust AI effectively handles exceptional conditions, such as abnormalities in input or malicious attacks, without causing unintentional harm.

Accountability and transparency

users should be able to see how an AI service works, evaluate its functionality, and comprehend its strengths and limitations. Increased transparency provides information for AI consumers to better understand how the AI model or service was created.

Privacy and Compliance

It is crucial to be able to protect AI models that might contain personal information, control what data goes into the model in the first place, and build adaptable systems that can adjust to changes in regulation and attitudes around AI ethics.

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