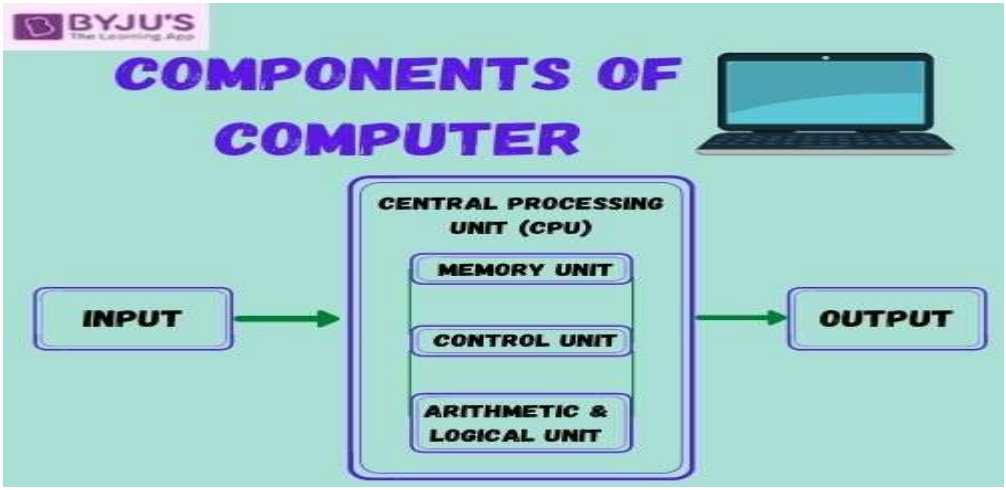
# CCA-101: Fundamentals of IT & Programming

## Q1: What are the four fundamental parts of computer? Explain it with the help of diagram.

computer is any machine that can be programmed to carry out a set of algorithms and arithmetic instructions.

There are five basic components which include:

1. Input Unit
2. Output Unit
3. Memory Unit
4. Control Unit
5. Arithmetical and Logical Unit




- Input Unit

A computer will only respond when a command is given to the device. These commands can be given using the input unit or the input devices.

For example: Using a keyboard we can type things on a Notepad and the computer processes the entered data and then displays the output of the same of the screen.

- Output Unit

When we command a computer to perform a task, it reverts for the action performed and gives us a result. This result is called output. There are various output devices connected to the

computer. The most basic of which is a monitor. Whatever we write using a keyboard or click using a mouse, is all displayed on the monitor.

Thus, the output unit gives us the final result once the entire processing is done within the mechanism of a device.

For example: when we visit an ATM, we enter our details like language, pin, amount to be withdrawn, etc. and then the final money which the cash dispenser releases is our outcome. In this case, the cash dispenser acts as an output unit.

- ## Memory Unit

When we enter the data into the computer using an input device, the entered information immediately gets saved in the memory unit of the Central Processing Unit (CPU). Because of the presence of some existing programming, the Memory Unit transmits the data further to the other parts of the CPU.

Similarly, when the output of our command is processed by the computer, it is saved in the memory unit before giving the output to the user.

- ## Control Unit

This is the core unit which manages the entire functioning of the computer device. It is one of the most essential components of the computer system.

The Control Unit collects the data entered using the input unit, leads it on for processing and once that is done, receives the output and presents it to the user. It can be said to the centre of all processing actions taking place inside a computer device.

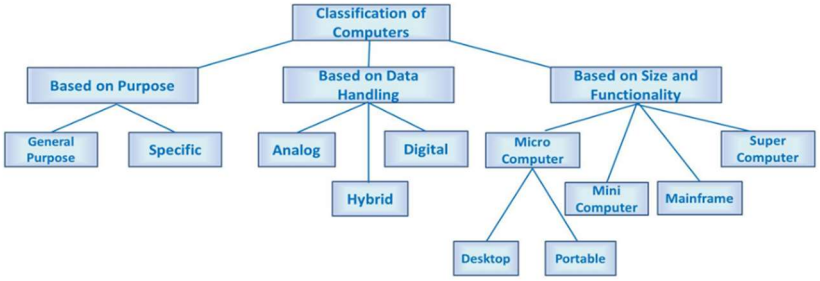
- ## Arithmetic & Logical Unit

As the name suggests, all the mathematical calculations or arithmetic operations are performed in the Arithmetic and Logical Unit of the CPU.

It can also perform actions like a comparison of data and decision-making actions. The ALU comprises circuits using which addition, subtraction, multiplication, division and other numerical based calculations can be performed

# Q2: Discuss about the classification of computers based on size and capacity.

Classifications of Computers System :-




Computers on the Basis of Size and Capacity

1. Super Computer
2. Mainframe Computer
3. Mini Computer
4. Micro Computer

## 1. SuperComputer

A Supercomputer is the very **fastest** and **powerful**, and **expensive** type of computer for processing data. Supercomputers' size and storage capacity are also huge (can occupy huge premises) designed to process vast amounts of data in a short time with high productivity.
These are specially made to perform **multi-specific tasks**. Therefore, many CPUs work in parallel order on these supercomputers. This function of a Supercomputer is called Multiprocessing or Parallel Processing. A supercomputer's design is complicated, like it can be heterogeneous, combining computers of different architectures, is significantly surpassed most existing personal computers. This made this machine an **ultra-high-performance** supercomputer.

**Applications**: The **uses of supercomputers** are dedicated to –

- In research and study of energy and nuclear weapons and designing the aircraft, airplanes, and flight simulators.
- Climate research and Weather Forecasting and Prediction of Natural Disasters.
- Spaceship and Satellite Launching.
- Used in scientific research laboratories.
- Used in Chemical and Biological research and for highly calculation complex tasks.

**Examples**: *IBM Roadburner, IBM Blue Gene, Intel ASI Red. PARAM-1000, and CRAY-XMP-14.*

## 2. Mainframe Computer

Mainframe computers are **multi-programming, high-performance** computers, and multi-user, which means they can handle the workload of more than 100 users at a time on the computer.

The storage capacity of the mainframe is enormous, with a high-speed data process as well. As well as handling hundreds of input and output devices at a time.

The mainframe is a highly efficient computer capable of **simultaneously solving complex calculations and continuously for a long time**. These computers have several microprocessors that have the ability to function the data at too high performance and speed.

The mainframe is ahead of our conventional modern Personal computers in almost every metric. The possibility of their "hot" replacement in the mainframe computer ensures continuity of operation. And the standard amount of processor utilization effortlessly exceeds 85% of the total power.

**Applications: Uses of Mainframe Computer –**

Mainframe computers are mainly used by departmental and commercial organizations like Banks, Companies, Scientific research centers, and governmental departments like railways. These computers can work for 24 hours. Hundreds of users can work on these computations simultaneously.

**Examples**: IBM Es000 series, ICL39 Series, and CDC 6600.

## 3. Mini Computer

Minicomputer is a **digital and multi-user** computer system with the connection of more than one CPU. Thus, many people can work on these computers simultaneously instead of a single person. Also, it can process with other accessories like a printer, plotter, etc.

### Applications: The uses of Minicomputers –

The minicomputers are used as real-time applications in Industries, bookings, and Research Centres. Banks also use minicomputers for preparing payroll for employees' salaries, records, tracking of financial accounts, etc. As well as in the field of Higher Education and Engineering.
**Examples**: PDP 11 and IBM (8000 Series).

## 4. Micro Computer

Today we are using many computers at home is also the most common microcomputer. With this invention of the microprocessors in the year 1970, it became possible to use computers for people personally at a low cost and reasonable price known as Digital **Personal Computer**. The design of microcomputers is minimal in size and storage capacity. These computers consist of many parts like *Input and Output devices, Software, operating systems, networks, and Servers* all these need to connect to form a complete Personal Digital Computer.

### Applications: The uses of MicroComputer –

PC is being widely used in many fields like home, office, data collection, business, education, entertainment, publishing, etc.
It keeps the details and prepares letters for correspondence in small businesses, creating bills, accounting, word processing, and operation of the filing systems in a large company.

**Examples**: Desktops, tablets, smartphones, and Laptops.

Generation in computer terminology is a change in technology a computer is/was being used. Initially, the generation term was used to distinguish between varying hardware technologies. Nowadays, generation includes both hardware and software, which together make up an entire computer system

**Q3: what is the meaning of computer generation? How many Computer Generations are**

**defined? What technologies were/are used?**

# First generation (1940 - 1956)


The first generation of computers used vacuum tubes as a major piece of technology. Vacuum tubes were widely used in computers from 1940 through 1956. Vacuum tubes were larger components and resulted in first-generation computers being quite large in size, taking up a lot of space in a room. Some of the first-generation computers took up an entire room.

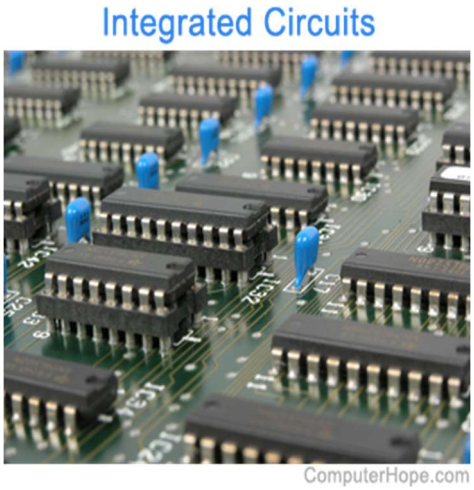
The ENIAC is a great example of a first-generation computer. It consisted of nearly 20,000 vacuum tubes, 10,000 capacitors, and 70,000 resistors. It weighed over 30 tons and took up a lot of space, requiring a large room to house it. Other examples of first-generation computers include the EDSAC, IBM 701, and Manchester Mark 1.

# Second generation (1956 - 1963)

The second generation of computers saw the use of transistors instead of vacuum tubes. Transistors were widely used in computers from 1956 to 1963. Transistors were smaller than vacuum tubes and allowed computers to be smaller in size, faster in speed, and cheaper to build.

The first computer to use transistors was the TX-0 and was introduced in 1956. Other computers that used transistors include the IBM 7070, Philco Transac S-1000, and RCA 501.

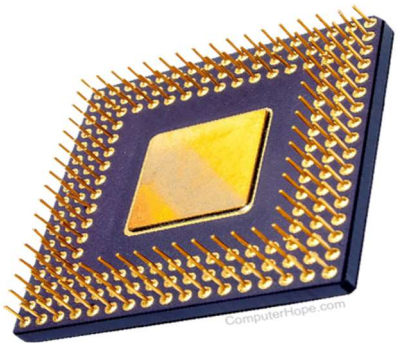
## Third generation (1964 - 1971)




The third generation of computers introduced the use of IC (integrated circuits) in computers. Using IC's in computers helped reduce the size of computers even more than second-generation computers, and also made them faster.

Nearly all computers since the mid to late 1960s have utilized IC's. While the third generation is considered by many people to have spanned from 1964 to 1971, IC's are still used in computers today. Over 45 years later, today's computers have deep roots going back to the third generation.

## Fourth generation (1972 - 2010)




The fourth generation of computers took advantage of the invention of the microprocessor, more commonly known as a CPU. Microprocessors, with integrated circuits, helped make it possible for computers to fit easily on a desk and for the introduction of the laptop.

Some of the earliest computers to use a microprocessor include the Altair 8800, IBM 5100, and Micral. Today's computers still use a microprocessor, despite the fourth generation being considered to have ended in 2010.

## Fifth generation (2010 to present)

The fifth generation of computers is beginning to use AI (artificial intelligence), an exciting technology with many potential applications around the world. Leaps have been made in AI technology and computers, but there is still room for much improvement.

One of the more well-known examples of AI in computers is IBM's Watson, which was featured on the TV show Jeopardy as a contestant. Other better-known examples include Apple's Siri on the iPhone and Microsoft's Cortana on Windows 8 and Windows 10

computers. The Google search engine also utilizes AI to process user searches.

## Sixth generation (future generations)

As of 2021, most still consider us to be in the fifth generation as AI continues to be developed. One possible contender for a future sixth generation is the quantum computer. However, until quantum computing becomes more developed and widely used, it's still only a promising technology.

### Q4: **Differentiate between Volatile & Non- Volatile memories.**

| | | |
|---|---|---|
| 1. | **Volatile memory is the type of memory in which data is lost as it is powered-off.** | **Non-volatile memory is the type of memory in which data remains stored even if it is powered-off.** |
| 2. | **Contents of Volatile memory is stored temporarily.** | **Contents of Non-volatile memory is stored permanently.** |
| 3. | **It is faster than non-volatile memory.** | **It is slower than volatile memory.** |
| 4. | **RAM(Random Access Memory) is an example of volatile memory.** | **ROM(Read Only Memory) is an example of non-volatile memory.** |
| 5. | **In volatile memory, data can be easily transferred in comparison to non-volatile memory.** | **In non-volatile memory, data can not be easily transferred in comparison to volatile memory.** |
| 6. | **In Volatile memory, process can read and write.** | **In Non-volatile memory, process can only read.** |

| | | |
|---|---|---|
| 7. | **Volatile memory generally has less storage capacity.** | **Non-volatile memory generally has more storage capacity than volatile memory.** |
| 8. | **In volatile memory, the program's data are stored which are currently in process by the CPU.** | **In non-volatile memory, any kind of data which has to be saved permanently are stored.** |
| 9. | **Volatile memory is more costly per unit size.** | **Non-volatile memory is less costly per unit size.** |
| 10. | **Volatile memory has a huge impact on the system's performance.** | **Non-volatile memory has a huge impact on a system's storage capacity.** |

## Q5: Distinguish among system software, application software and open source software on the basis of their features.

**System Software?**

**System software provides an interface between the system hardware and the user. It lets the system understand the command that the user inputs. We can also say that the system software serves as an interface between the hardware in a system and application software. It is also called as general purpose software. The end user usually does not directly interact with the system software. The user only gets to interact with the GUI that has been created by the system software.**

**Application Software?**

**We can define an application software as software written on a high-level language such as Java, C++, .net and VB for instance. This software is meant to meet some specific needs of the user. Some of the kinds of application software are designing software, a computing software, and an editing software. There is a specific purpose behind every application software.**

Open source software **is software with source code that anyone can inspect, modify, and enhance.**

**"Source code" is the part of software that most computer users don't ever see; it's the code computer programmers can manipulate to change how a piece of software—a "program" or "application"—works. Programmers who have access to a computer program's source code can improve that program by adding features to it or fixing parts that don't always work correctly.**

**Examples and conclusion**

**System software and application software together make a system useful to the end user. A system cannot run without system software. In other words, it is compulsory for making the system run. Application software is essential to perform specific tasks. They help achieve versatile kinds of functions on a system thus helping to customize a system for the specific requirements and situations of the user.**

**Q6. a) Create a file in MS-word to insert a paragraph about yourself and save it with file name**

**"yourself". Describe all steps involved in it.**

Step 1: Open Ms word on your system.

Step 2: Click on the new file when you open the word file when the dialog box appear.

Step 3: Once this click on Blank doc under the recent section, it will get in bold or highlighted by default.

Step 4: Click on the create A new blank doc will open.

Step 5: Once it is opened you can write anything you want in the doc for yourself.

Step 6: You can also edit the text you have written as you can change the background color ,or the text and many other things in the docs.

## Q6 b) Write steps regarding followings

## A]. To change the font style

## B]. To change the font size

## C]. To change the font color

## D]. To highlight (in yellow) the line that reads "need to get IMS's address".

**A] How to Change Font Style in MS Word**

1. **Select the text you want to modify.**
2. **Select the Home tab and locate the Font group.**
3. **Click the drop-down arrow next to font style box.**

4. **Font style menu appearsS**

5. **With a left click select the desired font style.**

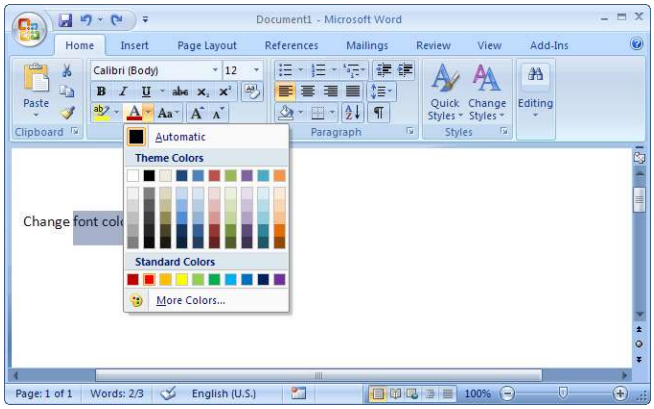
### B]. How to change the font size on Windows 10

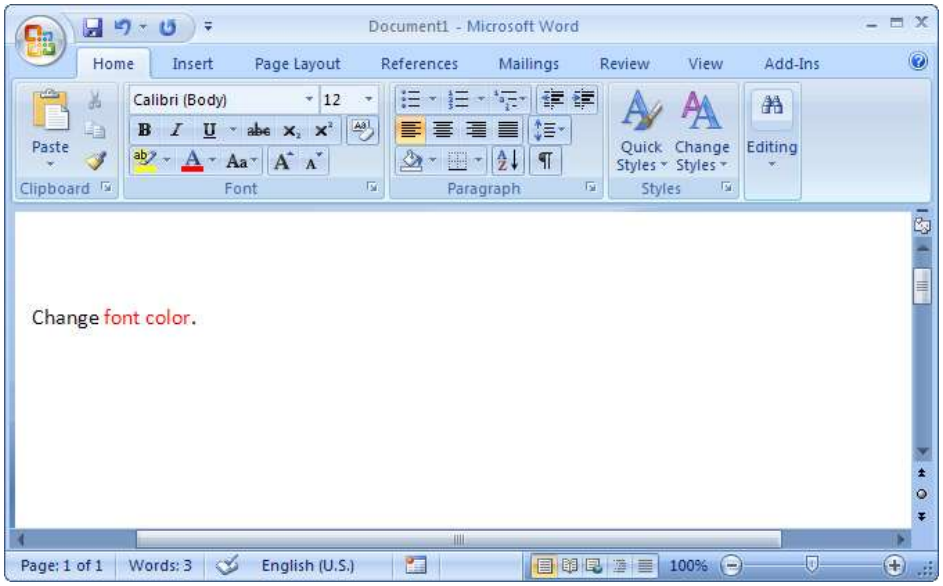
1. Click on the Windows icon and type "Settings" and click on the Settings app in the search results. ...
2. Click on the Ease of Access menu option. ...
3. Under Display, use the slider under the Make text bigger heading to adjust the text to the size you want it.

## C ]. To change the font color

Select the text that you'd like to change the font color. Then select the **Home tab** in the toolbar at the top of the screen. Then click on the arrow to the right of the *Font*

*Color* button in the **Font group**. A popup window should appear. Select the color that you'd like your text to be. In this example, we've selected a Red color.



D]. To highlight (in yellow) the line that reads “need to get IMS’s address”.

1. Click the Home tab.
2. In the Font group, click the Text Highlight button.

**3** Drag the mouse over the text you want to highlight.

4 The text becomes highlighted — just as if you used a highlighter on regular paper but far neater.

4. Click the Text Highlight button again to return the mouse to normal operation. Or press the Esc key to exit Highlighting mode.

**Q7. Create a file in MS-Word for the following document and save it with file name ‘ms_word’. Describe all steps involved in it.**

**A.To create a new document:**

1. Click the **Microsoft** Office button.
2. Select **New**. The **New Document** dialog box appears.
3. Select Blank **document** under the Blank and recent section. It will be highlighted by default.
4. Click **Create**. A **new** blank **document** appears in the **Word** window.

**B.To save a document:**

1. From the **File menu**, select Save As…
2. The Save As dialog box will display.
3. Choose a **location** on your computer to save your file. ...
4. Next to File Type is a drop down menu; select Rich Text Format (.rtf) or Microsoft Word (*.doc).
5. Click Save.

## Q14 b) Write the steps for the following action for creation of power point presentation

## ? Open a Blank presentation

## ? Save the presentation as Lab1.pptx

## ? Add a Title to the first slide: the name of your college

## ⍰ Type your first name and last name in the Subtitle section

## ⍰ Add a New Slide which has a Title and Content

**When beginning a new project in PowerPoint, you'll often want to start with a new blank presentation.**

1. Select the File tab to go to Backstage view.
2. Select New on the left side of the window, then click Blank Presentation.
3. A new presentation will appear.

**The following are the basic steps to save a presentation.**

1. Step 1 − Click on the File tab to launch the Backstage view and select Save.
2. Step 2 − In the Save As dialog, type in the file name and click "Save".
3. Step 3 − The default file format is . pptx.

How do you add a title to a slide?

4. 4. To add a slide title to an existing slide **go to the "Home" tab and click "Layout" then "Title Only"**. 5. Then place your cursor in the "Click to add title" box on the slide and type in your unique slide title.

**First and Last Name Title of Presentation Place, Date**
Instructions for editing personal data in the footer1. Select the "View" tab

2. Select "Slide Master" in the "Master Views" topic area

3. On the first slide (go back one slide), click the lower text box, and edit the personal entries

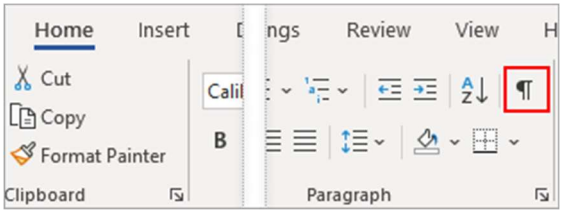
4. Close Master View: In the "View" tab select "normal" in the "Presentation Views" topic area.

5. Now the adapted footer texts can be seen on all pages

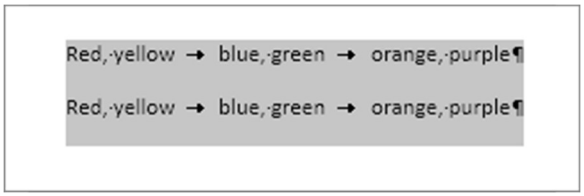
6. The footer entries can be changed again in the same way

7. Delete this instruction text and edit the title pageFirst and Last NameTitle of PresentationPlace, Date.

## 9]. Create a file in MS-word that convert existing highlight text to table as shown below and save it as file name 'text_to_table'. Describe all steps involved in it.



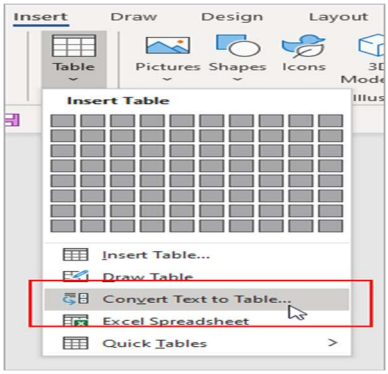

Insert separator characters—such as commas or tabs—to indicate where to divide the text into table columns.



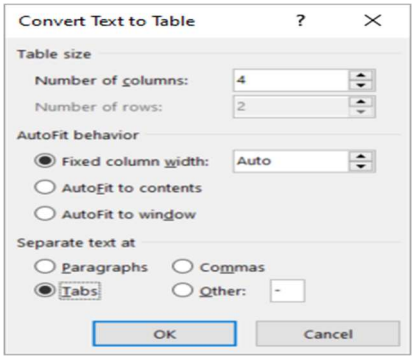

Use paragraph marks to indicate where you want to begin a new table row.

In this example, the tabs and paragraph marks will produce a table with 3 columns and 2 rows:

3. Select the text that you want to convert, and then click **Insert** > **Table** > **Convert Text to Table**.



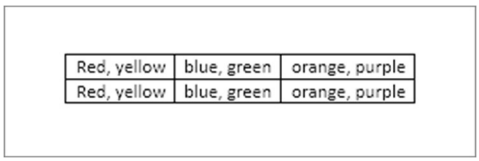

4. In the **Convert Text to Table** box, choose the options you want.



Under **Table size**, make sure the numbers match the numbers of columns and rows you want.

Under **AutoFit behavior**, choose how you want your table to look. Word automatically chooses a width for the table columns. If you want a different column width, choose one of these options:

1. **Under Separate text at, choose the separator character you used in the text.**
2. **Click OK. The text converted to a table should look something like this:**



| | | |
|---|---|---|
| Red, yellow | blue, green | orange, purple |
| Red, yellow | blue, green | orange, purple |

## Q19. Describe the syntax of the following statements

## a) If – else statement  b) for loop c) while loop d) do-while loop

**a) a) If – else statement**

**If...else if...else Statement**

**An if statement can be followed by an optional else if...else statement, which is very useful to test various conditions using single if...else if statement.**

**When using if...else if..else statements, there are few points to keep in mind –**

- **An if can have zero or one else's and it must come after any else if's.**
- **An if can have zero to many else if's and they must come before the else.**
- **Once an else if succeeds, none of the remaining else if's or else's will be tested.**

**Syntax**

**The syntax of an if...else if...else statement in C programming language is –**

```
if(boolean_expression 1) {
   /* Executes when the boolean expression 1 is true */
} else if( boolean_expression 2) {
   /* Executes when the boolean expression 2 is true */
} else if( boolean_expression 3) {
   /* Executes when the boolean expression 3 is true */
```

**} else {**

**/* executes when the none of the above condition is true */**

**}**

## b) for loop

A **for loop** enables a particular set of conditions to be executed repeatedly until a condition is satisfied. Imagine a situation where you would have to print numbers from 1 to 100. What would you do? Will you type in the printf command a hundred times or try to copy/paste it? This simple task would take an eternity. Using a for loop you can perform this action in three statements. This is the most basic example of the for loop. It can also be used in many advanced scenarios depending on the problem statement.

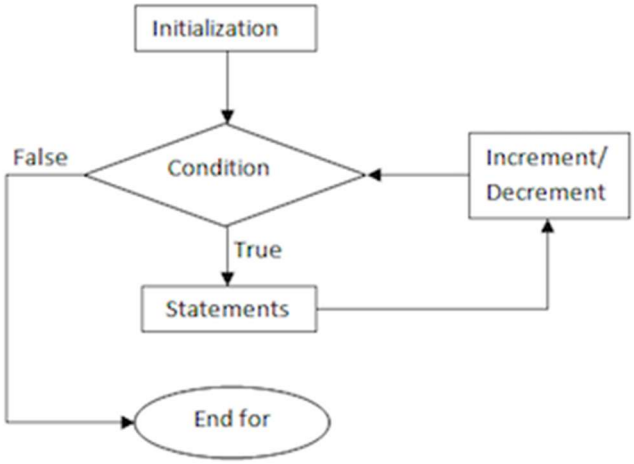



fig: Flowchart for for loop

# Syntax of a For Loop

```
1. for (initialization statement; test expression; update statement) {
2.  // statements
3. }
```

The for loop starts with a for statement followed by a set of parameters inside the parenthesis. The for statement is in lower case. Please note that this is case sensitive, which means the **for** command always has to be in lower case in C programming language.
The **initialization statement** describes the starting point of the loop, where the loop variable is initialized with a starting value. A loop variable or counter is simply a variable that controls the flow of the loop. The **test expression** is the condition until when the loop is repeated. **Update statement** is usually the number by which the loop variable is incremented.

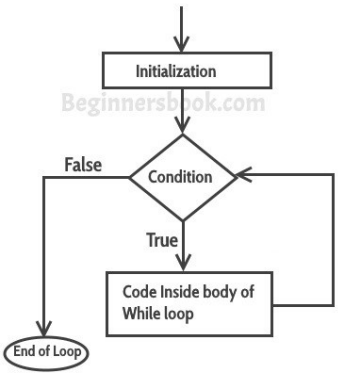
**c) while loop**

# C – while loop

Syntax of while loop:

```
while (condition test)
{
      //Statements to be executed repeatedly
      // Increment (++) or Decrement (--) Operation
}
```

## Flow Diagram of while loop




## Example of while loop

```
#include <stdio.h>
int main()
{
   int count=1;
   while (count <= 4)
   {
      printf("%d ", count);
      count++;
   }
   return 0;
}
```

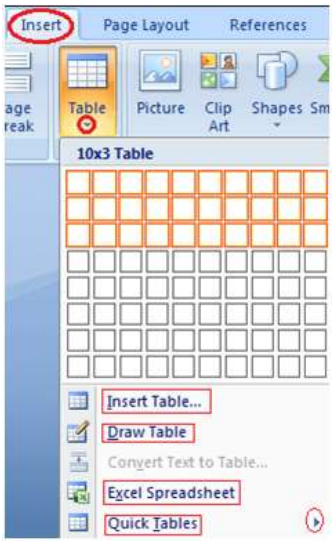
Output:

## Q10. Create a file in MS-Word to insert a table in the document. Describe all steps involved in it.

**How to Insert Table in MS Word**

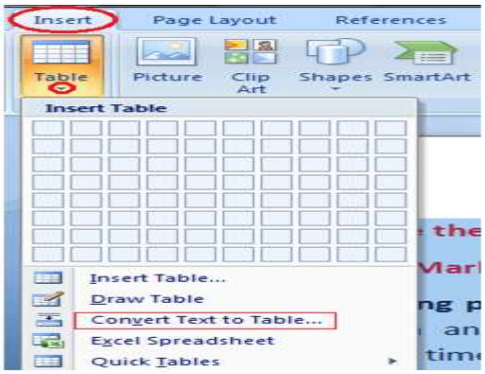
**Table is a versatile tool of MS Word. It allows you to organize your information, i.e. you can align text, present numerical data and create forms and calendar. The steps to insert table are given below;**

- **Place the cursor where you want to insert the table**
- **Select the Insert tab**
- **In Tables group click the Table command**
- **It displays different options to insert the table**
- **Select the desired option to insert the table**



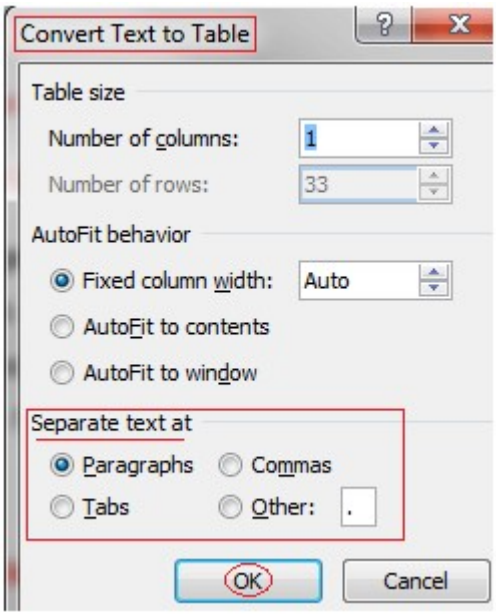

**To Convert Text to Table**

- **Select the text**
- **Select the Insert tab**
- **In Tables group click the Table command**
- **Select the 'Convert Text to Table' option;**



- **It displays a dialog box**
- **In 'Separate text at' section select the desired option**
- **Click OK, the text will convert to a table**

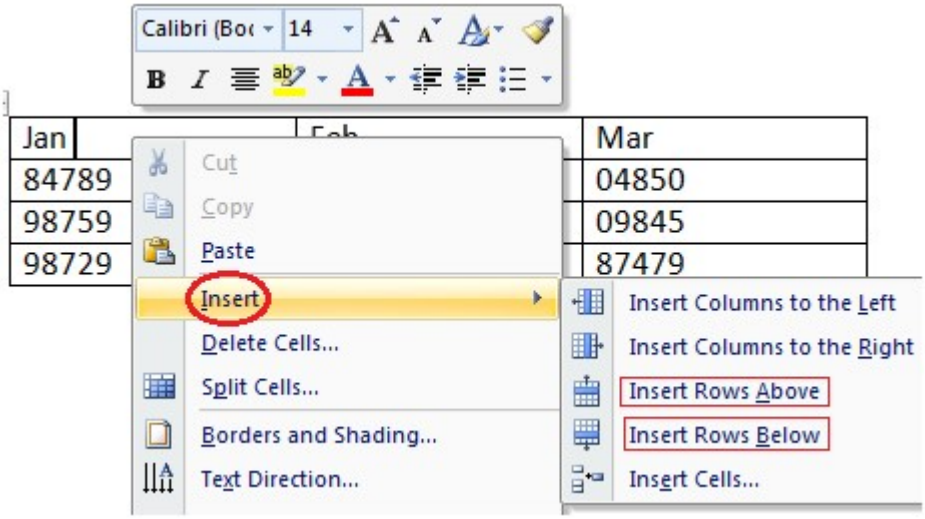
**See this image:**




**How to Add Row in Table**

**If you want to increase or add a new row in your table, you can follow the steps given below;**

- **Place the cursor in a row above or below which you want to add row**
- **Right click the mouse**
- **A menu appears**
- **Place the arrow over Insert option**
- **It will display a menu**
- **As required select 'Insert Rows Above' or 'Insert Rows Below'**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87479
Cut
Copy
Paste
Insert
Delete Cells...
Split Cells...
Borders and Shading...
Text Direction...
Insert Columns to the Left
Insert Columns to the Right
Insert Rows Above
Insert Rows Below
Insert Cells...