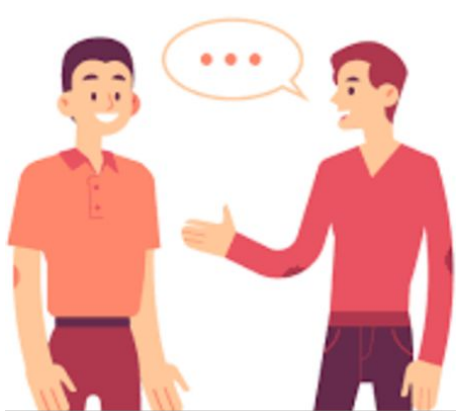


# Controlling the Computer



# Programming Languages



- System for describing computation.
- System of signs to communicate a task/algorithm to a computer, causing the task to be performed.

Problem



Human  
Instructions



```
10001001
11110000
10000001
00000111
.
.
```



Solve

Programming language

(Basic , VB , C , C++ , C# , Java , Perl , ...)

# Assembly Language and Machine Language

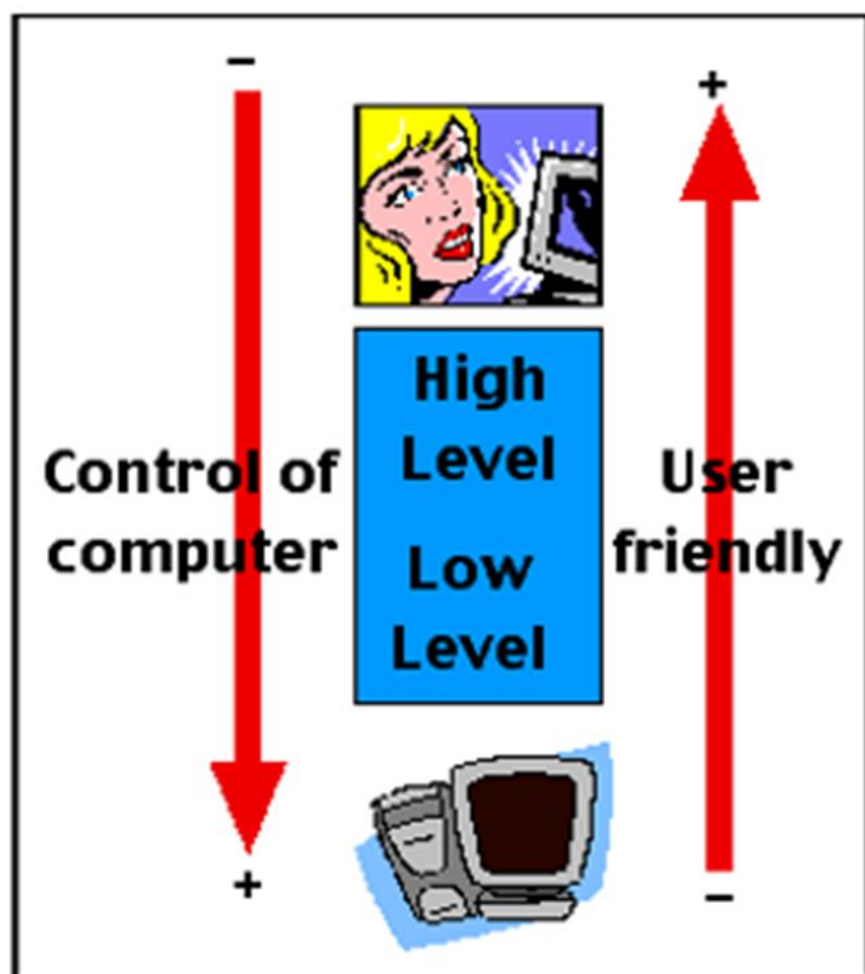
Machine language is the low-level programming language. It can only be represented by 0s and 1s. Earlier when we have to create pictures or show data on the screen of the computer then it is very difficult to draw using only binary digits(0s and 1s)

.For example: To write 120 in the computer system its representation is 1111000. So it is very difficult to learn. To overcome this problem the assembly language is invented

Assembly language is the more than low level and less than high-level language(such as C, C++, Java, Python, etc). So it is an intermediary language. Assembly languages use numbers, symbols, and abbreviations instead of 0s and 1s.

For example: For Addition, Subtraction, and Multiplications it uses symbols likes Add, Sub, and Mul, etc.



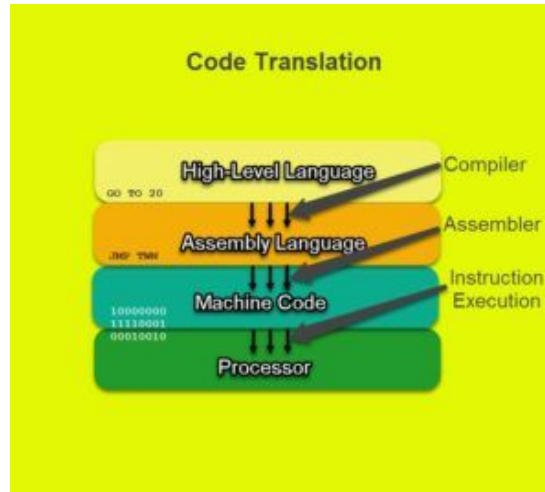


# Compilers and Translators

## Translator

A device that changes a sentence from one language to another without change of meaning.

A program that translates between programming languages.



# Programming languages

- C
- Java
- Python
- C++
- C#
- Visual Basic
- JavaScript
- PHP
- SQL
- Assembly language

# C Programming Language

creating system applications, meaning that operating systems such as Windows and Linux use a lot of C programming. You can also use C to create games, graphics, and apps that use lots of calculations.



```
printf("Hello, World!");
```



# Python

good for general use, such as for web applications, it also has many areas of specialisation. A good example of the latter is for artificial intelligence (AI) and machine learning.

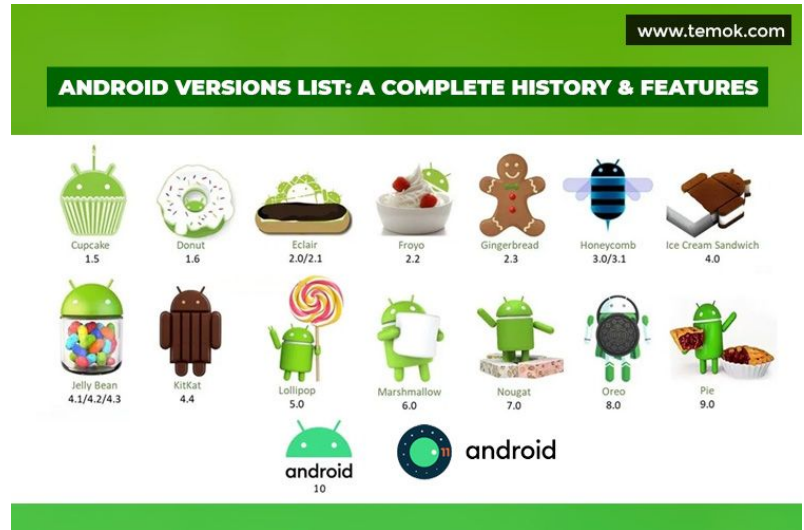


```
print('Hello, world!')
```

# Java

```
class HelloWorld {  
    public static void main(String[] args) {  
        System.out.println("Hello, World!");  
    }  
}
```

The 'write once, run anywhere' concept at the heart of Java means it has many different uses. However, some of the main uses include for business software, web applications, and mobile apps. Google's Android OS, for example, uses Java as its native language.



# JavaScript

```
console.log('Hello World');
```

JavaScript is a language used to write code that runs in web browsers. As such, it has a wide range of applications and is especially useful for making web pages interactive and responsive. It's often used alongside HTML and CSS to add things like animations, video players, and even browser-based games.



# C#

```
namespace HelloWorld
{
    class Hello {
        static void Main(string[] args)
        {

System.Console.WriteLine("Hello
World!");
        }
    }
}
```

Developers can use C# for a range of projects, including game development, server-side programming, web development, creating web forms, mobile applications, and more. C# has also been used to develop apps for the Windows platform, specifically Windows 8 and 10.



# SQL

```
BEGIN  
dbms_output.put_line ('Hello  
World..');  
END;
```

SQL is mainly used to communicate with databases. As such, it's used by server developers, database administrators, and software developers across a range of industries. However, more recently, it's also used in areas such as data analysis and big data mining.



# PHP

```
<!DOCTYPE html>  
<html>  
<body>
```

```
<h1>My first PHP page</h1>
```

```
<?php  
echo "Hello World!";  
?>
```

```
</body>  
</html>
```

There are many uses for PHP, although mostly for website development. You can use it to manage dynamic content and databases on a website, for example. The latter is particularly relevant, as it integrates well with database languages such as MySQL.

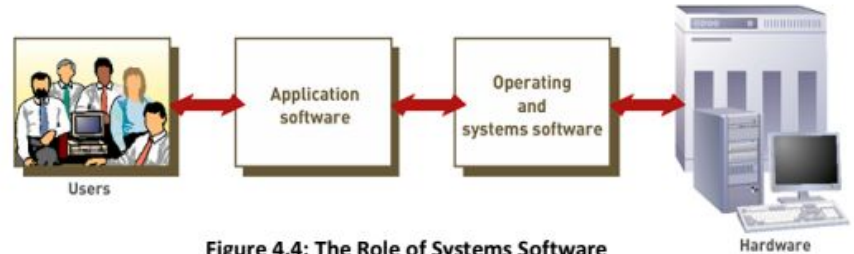


# Operating Systems



# Operating system (OS):

set of programs that controls the computer hardware and acts as an interface with application programs



**Figure 4.4: The Role of Systems Software**  
*Principles of Information Systems, Eighth Edition*

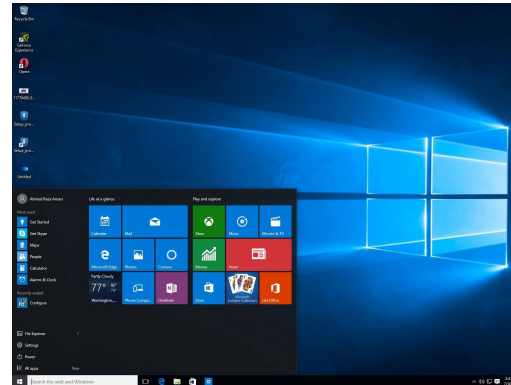


# Operating Systems Functions



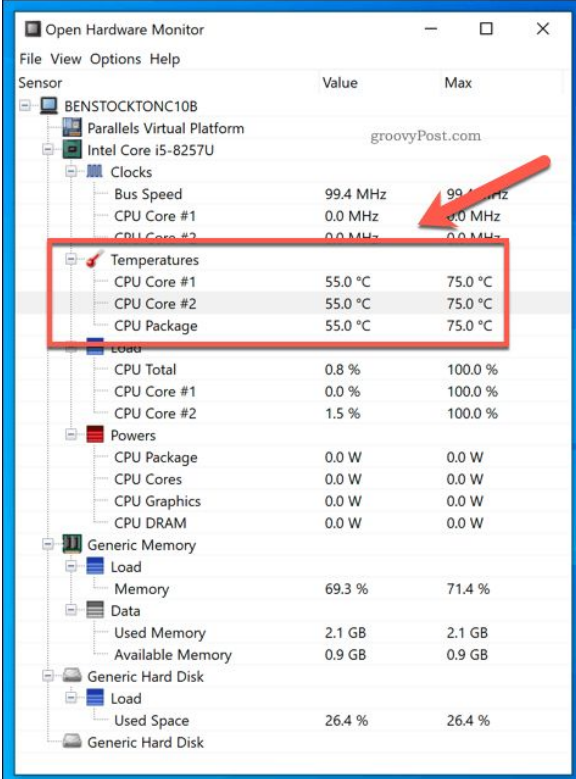
# 1. User interface and input/output management

- User interface: allows individuals to access and command the computer system.
- Command-based user interface: requires that text commands be given to the computer to perform basic activities.
- Graphical user interface (GUI): uses icons and menus displayed on screen to send commands to the computer system.



## 2. Hardware independence

- Application program interface (API): allows applications to make use of the operating system.

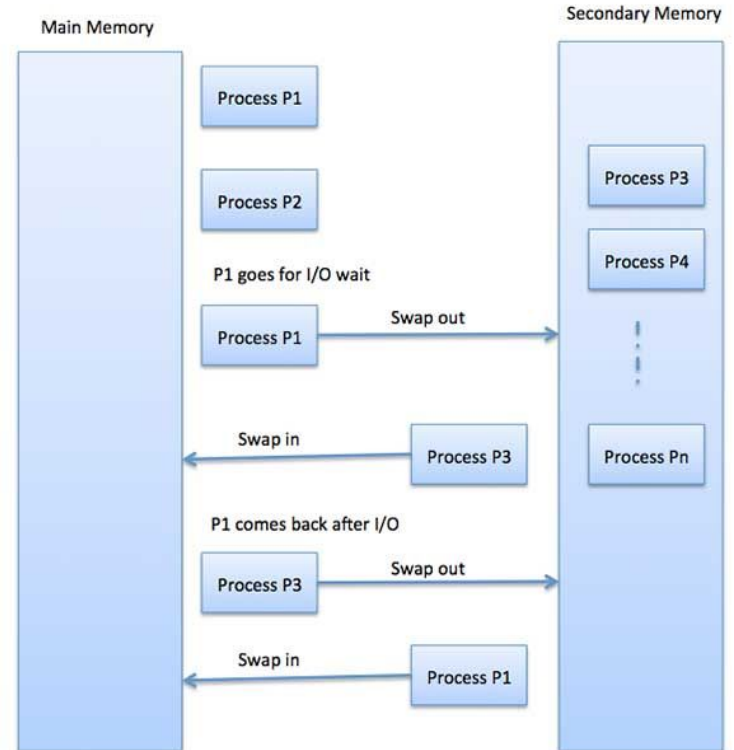


The screenshot shows the Open Hardware Monitor application window. The interface includes a menu bar (File, View, Options, Help) and a tree view on the left listing various hardware components. The main area displays a table of sensor data. A red box highlights the 'Temperatures' section, which includes CPU Core #1, CPU Core #2, and CPU Package. A red arrow points to the CPU Core #1 temperature value of 55.0 °C.

Sensor	Value	Max
BENSTOCKTONC10B		
Parallels Virtual Platform		
Intel Core i5-8257U		
groovyPost.com		
Clocks		
Bus Speed	99.4 MHz	99.4 MHz
CPU Core #1	0.0 MHz	0.0 MHz
CPU Core #2	0.0 MHz	0.0 MHz
Temperatures		
CPU Core #1	55.0 °C	75.0 °C
CPU Core #2	55.0 °C	75.0 °C
CPU Package	55.0 °C	75.0 °C
Load		
CPU Total	0.8 %	100.0 %
CPU Core #1	0.0 %	100.0 %
CPU Core #2	1.5 %	100.0 %
Powers		
CPU Package	0.0 W	0.0 W
CPU Cores	0.0 W	0.0 W
CPU Graphics	0.0 W	0.0 W
CPU DRAM	0.0 W	0.0 W
Generic Memory		
Load		
Memory	69.3 %	71.4 %
Data		
Used Memory	2.1 GB	2.1 GB
Available Memory	0.9 GB	0.9 GB
Generic Hard Disk		
Load		
Used Space	26.4 %	26.4 %
Generic Hard Disk		

### 3. Memory management

- Control how memory is accessed and maximize available memory and storage.

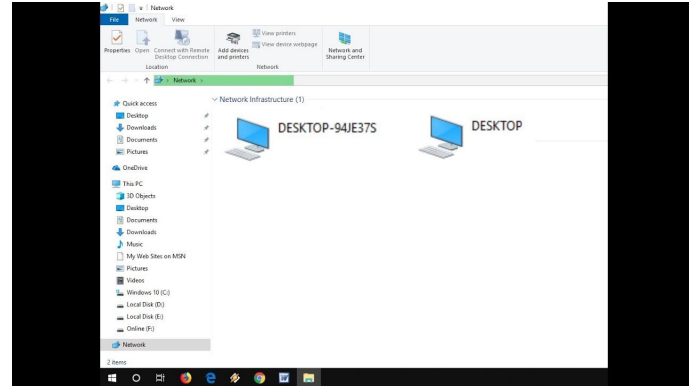


## 4. Processing task

- Multitasking: more than one program can run at the same time
- Time-sharing: allows more than one person to use a computer system at the same time
- Scalability: ability of the computer to handle an increasing number of concurrent users smoothly

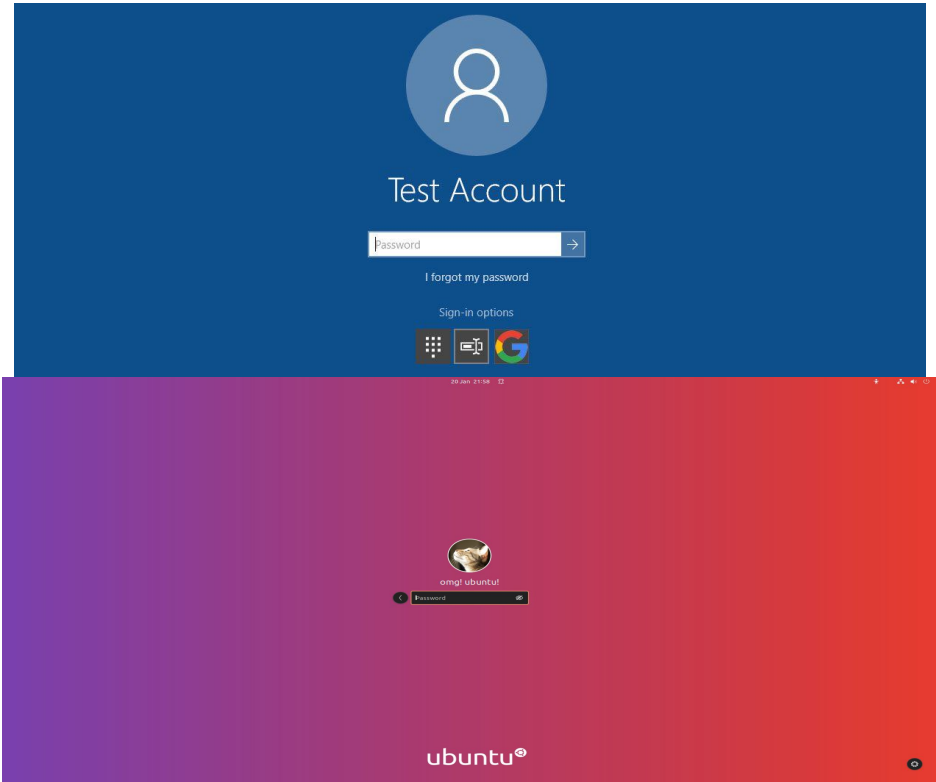
# 5. Networking capability

- Features and capabilities of the OS that aid users in connecting to a computer network



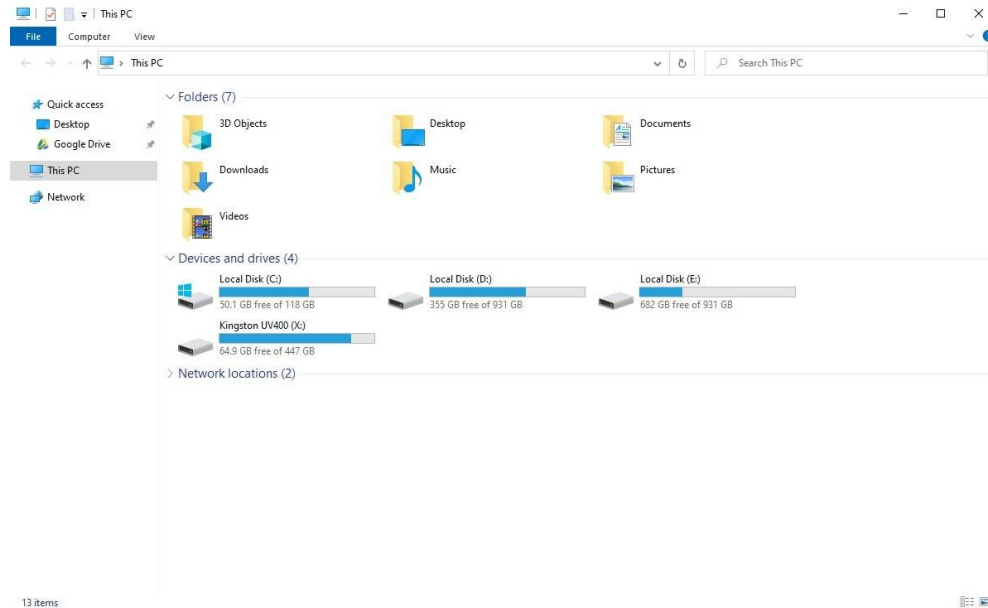
# 6. Access to system resources and security

- Protection against unauthorized access
- Logins and passwords



# 7. File management

- Ensures that files in secondary storage are available when needed and that they are protected from access by unauthorized users





# Different Operating Systems

Personal	Workgroup	Enterprise
Windows Vista, Windows XP, Windows Mobile, and Windows Embedded	Windows NT Server	Windows NT Server
Mac OS	Windows 2003 Server	Windows 2003 Server
Mac OS X	Mac OS Server	Windows Advanced Server, Limited Edition
UNIX	UNIX	UNIX
Solaris	Solaris	Solaris
Linux	Linux	Linux
Red Hat Linux	Red Hat Linux	Red Hat Linux
Palm OS	Netware	
	IBM OS/390	IBM OS/390
	IBM z/OS	IBM z/OS
	HP MPE/iX	HP MPE/iX

## Comparison Application Software and System Software

	System Software	Application Software
	Computer software, or just software is a general term primarily used for digitally stored data such as computer programs and other kinds of information read and written by computers. App comes under computer software though it has a wide scope now.	Application software, also known as an application or an "app", is computer software designed to help the user to perform specific tasks.
Example:	1) Microsoft Windows 2) Linux 3) Unix 4) Mac OSX 5) DOS	1) Opera (Web Browser) 2) Microsoft Word (Word Processing) 3) Microsoft Excel (Spreadsheet software) 4) MySQL (Database Software) 5) Microsoft PowerPoint (Presentation Software) 6) Adobe Photoshop (Graphics Software)
Interaction:	Generally, users do not interact with system software as it works in the background.	Users always interact with application software while doing different activities.
Dependency:	System software can run independently of the application software.	Application software cannot run without the presence of the system software.