# SCS 050- Introduction to Computer Programming IT/OS/ICT/CR/10/6- Develop Computer Program

J. Kamiri

jkamiri@mut.ac.ke

0795373074

Department of Information Technology Murang'a University of Technology

# Career Options in programming

- Software developer
- System Auditor
- Software Project managers
- System Administrators
- Software Quality Assurance Engineer
- Among others

## Preamble

- Most people are familiar with the existing tasks the computer can perform.
- You will learn how to command computers to perform those tasks. i.e software-instructions you write to command computers to perform actions and make decisions that controls computer hardware.

# **Programming Concepts**

- Program-it is a sequence of instructions, statements, and series of codes that instruct a computer to perform certain tasks.
- Programmer-this is a person that writes the programs to the computer through orderly set of actions.
- Programming-This is the act of writing, coding, testing and running a series of instructions to perform a certain task.
- Programming language-This is an organized collection of symbols with syntax and semantics to prepare computer programs.
- Modules-smaller programs units, also known as subsets of a program

There are three categories of programming languages:

- Machine Language: This is the only language that the computer understands. It consists of a set of numbers i.e 0's and 1's
- Assembly Language: it is an upgrade to machine language, it uses keywords and symbols to represent instructions. Assembly language needs to be translated to machine language.
- High-level Languages: Modern programming languages. They are machine independent. Their syntax is much easier to use than the previous two.

They can be divided into procedural and object-oriented languages.

They include; C, C#, visual Basic, Java, Python

# Characteristics of High-level languages

- Clarity of the source code-The ability of the code to be readable, understandable and also reflect the logical structure of the program.
- Maintainability-Ability to modify a program in future
- Portability-The ability of the program to be transferred from one hardware/software environment to another e.g from windows to Unix or Linux system or from one machine to another
- Reliability-This is the ability of the language to perform its intended function satisfactorily throughout their expected time of the process.
- Generality/ Universal-Features of a programming language should remain constant e.g when you want to print to the screen, we use printf which is used all through in programming.

- A programming paradigm is an approach to solving programming problems
- A programming paradigm may consist of many programming languages.
- Programming paradigms are the result of people's ideas about how programs should be constructed
- A programming language can belong to more than one paradigm
- They include: Procedural/sequential, Object-oriented, Event-Oriented, Functional, Scripting, modular

### Imperative/procedural/sequential paradigm

- Designs a program that follows a series of instructions in a sequential manner.
- i.e it follows top-bottom approach in program execution.
- Example C programming

### **Functional Programming:**

- In this paradigm, a program consists of functions and uses functions in a similar way as used in mathematics
- Execution involves functions calling one another.
- Example FOTRAN

### **Object-Oriented Programming**

- This paradigm uses classes and objects.
- It has other concepts such as inheritance, polymorphism, encapsulation, etc. Example, Java, C++, Python, Visual Basic

### **Event-driven Programming**

- Programming that is based on user events such as clicking a button, hoovering a mouse, etc. These user actions are called events
- Mainly uses a Graphical user Interface (GUI)
- Example; Visual Basic programming, Java

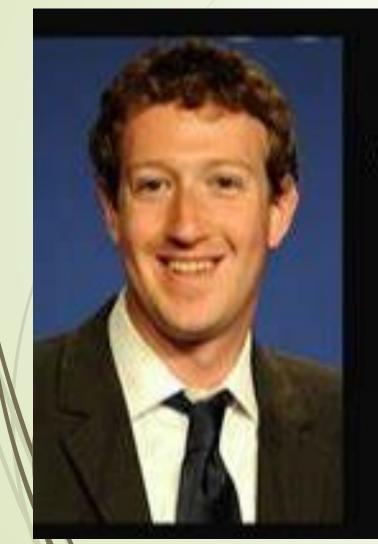
### Scripting:

- Scripting is a very "high" level of programming which glues together different programs.
- Scripts are written in presence of core programming language, though they are different from the core programming language
- They are mostly used in website development and mobile application development. Example: JavaScript is used to make a website to be responsive.

### Modular:

- Divides the program into sections known as modules, each module is developed independent of one another then the modules are integrated to create the final program.
- Majority of programming especially event-driven and OOP apply modular approach

# THE END



All of my friends who have younger siblings who are going to college or high school - my number one piece of advice is: You should learn how to program.

(Mark Zuckerberg)