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

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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

Programming Paradigms

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.

Programming Paradigms

- 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

Programming Paradigms

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

Programming Paradigms

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

Programming Paradigms

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

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)

izquotes.com

THE END