

Chapter 1

Overview of Programming and Problem Solving

Dale/Weems/Headington

Slides by Sylvia Sorkin, Community College of Baltimore County - Essex Campus

1

What is Computer Programming?

- It is the process of planning a sequence of steps (called instructions) for a computer to follow.

STEP 1

STEP 2

STEP 3

...

2

Programming Life Cycle Phases

- 1 **Problem-Solving**
- 2 **Implementation**
- 3 **Maintenance**

3

Problem-Solving Phase

- **ANALYZE** the problem and **SPECIFY** what the solution must do
- develop a **GENERAL SOLUTION (ALGORITHM)** to solve the problem
- **VERIFY** that your solution really solves the problem

4

Basic Control Structures

- a **sequence** is a series of statements that execute one after another
- **selection (branch)** is used to execute different statements depending on certain conditions
- **Looping (repetition)** is used to repeat statements while certain conditions are met.
- a **subprogram** is used to break the program into smaller units

16

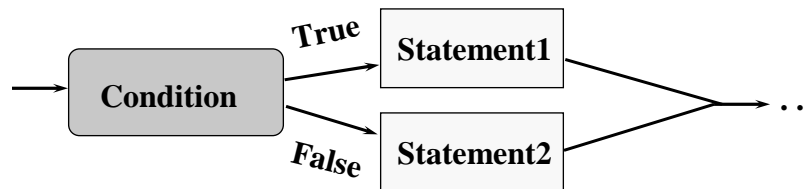
SEQUENCE



17

SELECTION (branch)

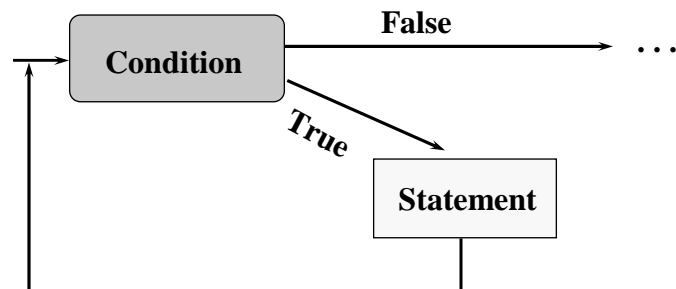
IF Condition THEN Statement1 ELSE Statement2



18

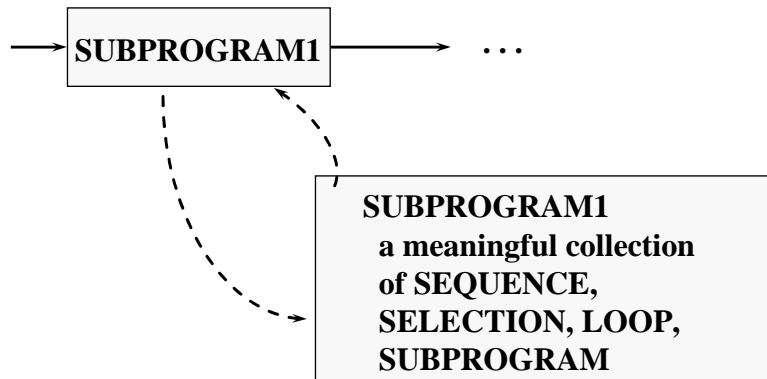
LOOP (repetition)

WHILE Condition DO Statement1



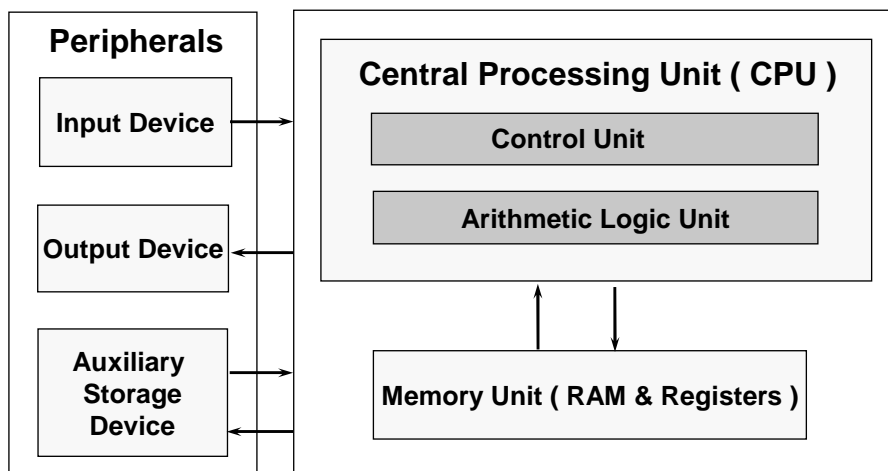
19

SUBPROGRAM (function)



20

Computer Components



21

Memory Unit

- **is an ordered sequence of storage cells, each capable of holding a piece of information**
- **each cell has its own unique address**
- **the information held can be input data, computed values, or your program instructions.**

22

Central Processing Unit

- **has 2 components to execute program instructions**
 - **Arithmetic/Logic Unit performs arithmetic operations, and makes logical comparisons.**
 - **Control Unit controls the order in which your program instructions are executed.**

23

Peripherals

- **are input, output, or auxiliary storage devices attached to a computer**
 - **Input Devices include keyboard and mouse.**
 - **Output Devices include printers, video display, LCD screens.**
 - **Auxiliary Storage Devices include disk drives, scanners, CD-ROM and DVD-ROM drives, modems, sound cards, speakers, and digital cameras.**

24