

Problem Solving

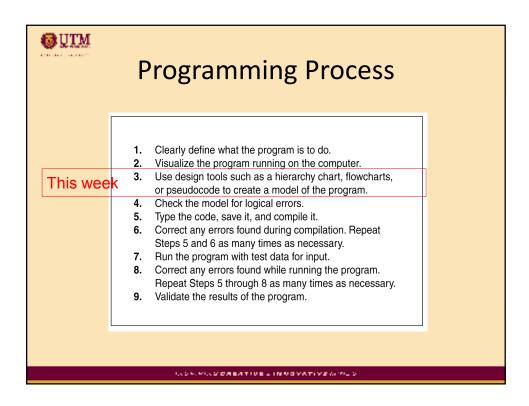
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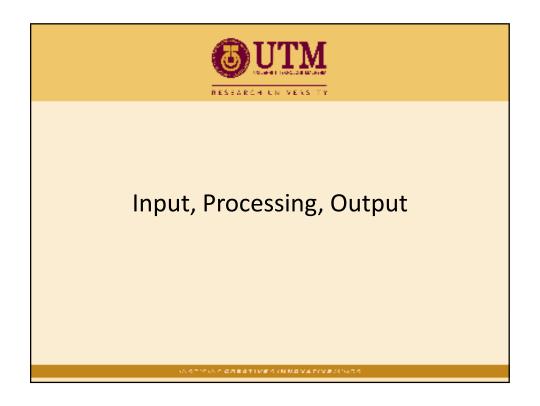


Programming Process

- Programming is a process of problem solving
- Problem solving techniques
 - Analyze the problem
 - Outline the problem requirements
 - Design steps (algorithm) to solve the problem

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Input, Processing & Output

Three steps that a program typically performs:

- 1) Gather input data:
 - from keyboard
 - · from files on disk drives
- 2) Process the input data
- 3) Display the results as output:
 - send it to the screen
 - write to a file

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Problem Solving

- The moment you read the problem, you should try to answer the following questions:
 - What information should the solution provide?
 - What data do I have to work with?
 - How to work with the data to deliver the needed solution?
- The answer to the first question will tell you the problem outputs; the answer to the second question will tell you the problem inputs; the answer to the third question will tell you the process.

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Example 1

- Develop a program to calculate area of a rectangle.
 - 1. Input data
 - i) Length
 - ii) width
 - 2. Process the input data
 - i) Area=length*width
 - 3. Output data
 - i) area

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In-Class Exercise

- Do Lab 2, Exercise 3, No. 1, pg. 27
 - Identify the following information:
 - 1. Input data
 - 2. Process the input data
 - 3. Output data
- Do Lab 2, Exercise 3, No. 2, pg. 27
- Do Lab 2, Exercise 3, No. 3, pg. 28
- Do Lab 2, Exercise 3, No. 4, pg. 28



Representation of Algorithm

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Problem Solving Methods in this Class

- 3 problem solving methods will be discussed in this class are:
- 1. Develop Algorithms
 - Flowchart
 - Pseudo code
- 2. Top-down design
 - Structured Chart

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Algorithms

- Algorithm a sequence of a finite number of steps arranged in a specific logical order to produce the solution for a problem.
- Algorithms requirements:
 - i. Must have input
 - ii. Must produce output
 - iii. Unambiguous
 - iv. Correctness
 - v. Finiteness

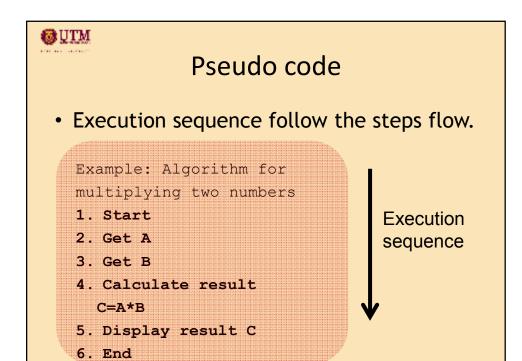
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Pseudo code

- Pseudocode is a semiformal, English-like language with limited vocabulary that can be used to design & describe algorithms.
- Purpose- to define the procedural logic of an algorithm in a simple, easy-tounderstand for its readers.
- Free of syntactical complications of programming language.

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In-Class Exercise

The following pseudocode algorithm has an error.
 Find the error.

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area = width x length.
Display "What is the room's width?"
Input width.
Display "What is the room's length?"
Input length.
Display area.

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In-Class Exercise

- Refer to your solution for :
 - Lab 2, Exercise 3, No. 1, pg. 27
 - Lab 2, Exercise 3, No. 2, pg. 27
- Develop a pseudo code for both questions.

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In-Class Exercise

- Write pseudo code algorithms for the following.
 - A program that calculates a customer's available credit should ask the user for the following:
 - The customer's maximum amount of credit
 - · The amount of credit used by the customer

Once these items have been entered, the program should calculate and display the customer's available credit. You can calculate available credit by subtracting the amount of credit used from the maximum amount of credit.

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