

# Pseudo Code

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## Algorithm

- ❖ An **Algorithm** is a clear and unambiguous specification of the steps needed to solve a problem.
- ❖ It may be expressed in either:
  - ✓ **Human language** (English, Arabic)
  - ✓ Through a graphical representation like a **flowchart**
  - ✓ Through a **pseudo code**.
- ❖ There are two commonly used tools to help to document the algorithm.
  - Flowcharts
  - Pseudo code
- ❖ Generally, flowcharts work well for small problems but Pseudo code is used for larger problems.

## Pseudo Code

- ❖ Pseudo code is a detailed yet readable description of what a computer program or algorithm must do, expressed in a formally-styled natural language rather than in a programming language.
- ❖ Pseudo code is sometimes used as a detailed step in the process of developing a program. It allows designers or programmers to express the design in great detail and provides programmers a detailed template for the next step of writing code in a specific programming language.
- ❖ Pseudo-Code is simply a numbered list of instructions to perform some task.
- ❖ It is designed for planning purposes only. By nonstandard, if you open five books on programming, all would have pseudo code examples but all of those examples would look somewhat different.
- ❖ Pseudo code provides us with a way to concentrate on just logic structures without be constrained by the syntax rules of a particular programming language.

## **Basics to writing Pseudo code**

### 1) **A computer can receive information(input to computer)**

- ❖ **Get, Read or Input** are used when the algorithm must receive input from the keyboard:
  - **Get** filename
  - **Read** class number
  - **Input** radius

### 2) **A computer can put out information(output from computer)**

- ❖ **Print, Write, Output or Display** are used when the output must be displayed on the screen:
  - **Print** 'Program Completed'
  - **Write** student names
  - **Display** area
- ❖ **Prompt** is used for explaining to what variable should be input:
  - **Prompt** user to enter the radius

### 3) **A computer can perform arithmetic(processing)**

- ❖ Either actual mathematical symbols or words can be used:
  - **Multiply** Length by Width to **Compute** Area
  - $\text{Area} = \text{Length} * \text{Width}$
- ❖ Words and equivalent symbols used in pseudo code:
  - **Parentheses** or ( )
  - **Add** or +
  - **Subtract** or -
  - **Multiply** or \*
  - **Divide** or /
  - **Modulus** or %
- ❖ **Compute** and **Calculate** also possible:
  - **Compute** degrees Celsius
  - $C = (F - 32) / 1.8$

### 4) **A computer can assign a value to a variable or memory location(processing)**

- ❖ **Initialize** or **Set** are used to give data an initial value:
  - **Set** total\_price to 0
  - **Initialize** PI to 3.14
- ❖ = or ← are used to assign a value as a result of processing:
  - $\text{total\_price} \leftarrow \text{cost\_price} + \text{sales\_tax}$

**Note:**

***Pseudo code must start by Begin and end by End***

## Examples of pseudo code

- A. Find the Summation of two numbers:
1. Begin
  2. **Prompt** user to enter for number\_one
  3. **Get** number\_one
  4. **Prompt** user for to enter number\_two
  5. **Get** number\_two
  6.  $sum \leftarrow number\_one + number\_two$
  7. **Display** sum
  8. End
- B. Calculating the Circle area:
1. Begin
  2. **Initialize**  $PI$  to 3.14
  3. **Prompt** user to enter radius
  4. **Read** radius
  5.  $area \leftarrow PI * radius * radius$
  6. **Print** area
  7. End
- C. Calculating the Rectangle area:
1. Begin
  2. **Prompt** user to enter Length
  3. **Input** Length
  4. **Prompt** user to enter Width
  5. **Input** Width
  6. **Multiply** Length by Width to **Compute** Area
  7. **Output** Area
  8. End

## Homework number (1) delivered next week

Write the pseudo codes do the following:

1. Calculate the summation of three numbers no1, no2, no3
2. Compute the product of three numbers no1, no2, no3
3. Find the average of three numbers no, no2, no3
4. Calculate the summation, average and product of three numbers no, no2, no3