National University of Computer and Emerging Sciences

Lab Manual # 2

Programming Fundamentals

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Objectives

The objectives of this lab are to cover the following:

- How do we write an algorithm in the form of pseudocode.

Pseudocode:

Pseudocode is a slightly more formal way of describing and outlining an algorithms. It is a design language that closely resembles a high-level programming language, but does not require the use of all the precise syntax of the programming language.

Primary advantage is that pseudocode allows you to focus on the logical details of your program solution without getting bogged down with the syntax rules of the target programming language.

Pseudocode Examples

Example1: Enter three numbers and find and print their average.

Variables required (names and types):

x, y, z: to store the three numbers
sum: to store the sum of the numbers
average: to store the average of the numbers

Pseudocode solution:

```
print "Enter the three numbers:"
input x, y, z
sum = x + y + z
average = sum/3.0
print "The average value = " and average
```

Example 2: Prompt for and input a test score (integer values in the range 0-100) and then determine and print if the score is passing (60 or more).

Variables required (names and types):

score: to store the score

Pseudocode solution:

```
print "Enter the score:"
input   score
if score≥ 60
        print "The score is passing"
```

Example 3: Prompt for and enter 30 numbers and find and print their average. Note: This example is similar to example 1. But, it is not practical to use 30 different variables here for the numbers, so the solution given here uses a *looping structure*

Variables required (names and types):

x, average: to store the current number and the average value
sum: an accumulator to accumulate the sum of the 30 numbers

counter: a counter to count the number of numbers entered

Pseudocode solution:

Initialize the variable *sum* = 0.
Initialize the variable *counter* = 1.
while *counter*< 31
    print "Enter a number:"
    input *x*
    sum = *sum* + *x*
    counter = *counter* + 1
average = *sum*/30.0
print "The average value =" and *average*

Question#1

Write a pseudocode which asks the user to enter the radius of a circle and then calculates and prints the area and circumference of the circle.

Question#2

Write a pseudocode which asks the user to enter two different numbers and determines is one of them is twice the other number. Then print the smaller one.

Question#3

Write pseudo code that performs the following: Ask a user to enter a number. If the number is between 0 and 10, write the word blue. If the number is between 10 and 20, write the word red. If the number is between 20 and 30, write the word green. If it is any other number, write that it is not a correct color option.

Question#4

Write a pseudo code that read a number from the user, test whether it is even or odd and then display accordingly.

Question#5

Read N numbers and display percentage of positive numbers, percentage of zeros and percentage of negative numbers. (Note that the value of N will be entered by the user).