Introduction to Programming – Loops, Strings and Array

# Practice questions

1. Write an algorithm in pseudo-code to display the sum of all numbers from 1 to 10.

Solution –

**Algorithm CalculateSumOfNumbers**

**Input:**

None

**Output:**

sum (sum of numbers from 1 to 10)

**Steps:**

1. Set sum = 0

2. Set number = 1

3. Repeat steps 3.1 and 3.2 until number <= 10:

3.1. Add number to sum

3.2. Increase number by 1

4. Display "The sum of numbers from 1 to 10 is: " + sum

2. Write a simple algorithm in pseudo-code that takes two numbers as input and displays the sum of all the numbers between those two numbers (inclusive).

**Algorithm CalculateSumBetweenNumbers**

**Input:**

num1, num2 (two numbers)

**Output:**

sum (sum of numbers between num1 and num2)

**Steps:**

1. Read num1

2. Read num2

3. Set sum = 0

4. If num1 < num2, then

currentNumber = num1

endNumber = num2

Else

currentNumber = num2

endNumber = num1

5. Repeat while currentNumber <= endNumber:

5.1. Add currentNumber to sum

5.2. Increase currentNumber by 1

6. Display "The sum of numbers between " + num1 + " and " + num2 + " is: " + sum

3. Write an algorithm in pseudo-code that calculates and displays the factorial of a given number.

**Algorithm CalculateFactorial**

**Input:**

number (a non-negative integer)

**Output:**

factorial (factorial of the given number)

**Steps:**

1. Read number

2. Set factorial = 1

3. Set i = 1

4. Repeat while i <= number:

4.1. Multiply factorial by i

4.2. Increase i by 1

5. Display "The factorial of " + number + " is: " + factorial

4. Write an algorithm in pseudo-code to find the length of an array.

**Algorithm FindArrayLength**

**Input:**

array (an array of elements)

**Output:**

length (the length of the array)

**Steps:**

1. Read array

2. Set length = 0

3. Iterate through each element in the array:

3.1. Increase length by 1 for each element encountered

4. Display "The length of the array is: " + length

5. Write an algorithm in pseudo-code an algorithm in pseudo-code to find the largest number in an array.

**Algorithm FindLargestNumberInArray**

**Input:**

array (an array of numbers)

**Output:**

largest (the largest number in the array)

**Steps:**

1. Read array

2. Set largest = array[0] (Assuming array is not empty)

3. Iterate through each element in the array starting from the second element:

3.1. If the current element is greater than 'largest', then:

3.1.1. Set largest = current element

4. Display "The largest number in the array is: " + largest

6. Write an algorithm in pseudo-code that reverses a string and checks whether it's a palindrome or not. A palindrome is a sequence of characters (like a string) that reads the same forward as it does backward. For e.g. *radar, dad, madam*, etc

**Algorithm ReverseAndCheckPalindrome**

**Input:**

str (a string)

**Output:**

reversedStr (reversed string)

isPalindrome (boolean indicating if the string is a palindrome)

**Steps:**

1. Read str

2. Set reversedStr = ""

3. Set length = length of str

4. Iterate index from length-1 down to 0:

4.1. reversedStr = reversedStr + str[index]

5. If str is equal to reversedStr, then:

isPalindrome = true

Else:

isPalindrome = false

6. Display "The reversed string is: " + reversedStr

7. Display "Is the string a palindrome? " + isPalindrome

7. Write an algorithm in pseudo-code to print the multiplication table of a given number using loops.

**Algorithm PrintMultiplicationTable**

**Input:**

number (a positive integer)

**Output:**

Multiplication table for the given number

**Steps:**

1. Read number

2. Set i = 1

3. Display "Multiplication table for " + number + ":"

4. Repeat while i <= 10:

4.1. Set product = number \* i

4.2. Display number + " \* " + i + " = " + product

4.3. Increase i by 1

# Practice Questions DIY

1. Write an algorithm in pseudo-code to display the average of all the numbers in an array.

2. Write an algorithm in pseudo-code that counts the number of vowels in a given string.

3. Write an algorithm in pseudo-code to display the sum of all odd numbers from 1 to 100.

4. Write an algorithm in pseudo-code that counts the number of words in a sentence or a given string.

5. Write an algorithm in pseudo-code to find the sum of digits of a number using a loop.