INFORMATICS INSTITUTE OF TECHNOLOGY

BEng/ BEng (Hons) Software Engineering

Module – 4COSC006C - Software Development I

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Assessment type –

Assessment topic – Creating an Algorithms

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Q – 1,

Write an algorithm for calculating the perimeter and surface area of square, if the length of the sides of the square is given by the user.

1. Start
2. Get the length of one side of square and note it.
3. Use the calculation (4 × one side length) get the perimeter of square.
4. Geth the side length again,
5. Use the calculation to get surface area of square (area = side length × side length)
6. After doing calculation get the answers from step 3 and 5
7. End

Q – 2,

Write an algorithm for a program that will

(1) ask for the user's name, then

(2) print HI and the name. The program will then

(3) ask what year the user was born,

(4) calculate the age, and

(5) print the age.

1. Start
2. Ask the user to input his name.

3. After he entering his name add the word “Hi” before his name
4. Print his name with “Hi” (“Hi Sachintha”)
5. Again, ask the user to enter his birth year.
6. After he is entering his birth year calculate his age
7. Using calculation (age = current year – birth year)
8. After do9ing calculation show to him his age
9. End

Q – 3,

Construct an algorithm that will receive an integer from the screen, add 5 to it, double it, subtract 7 from it, and display the final number to the screen.

1. Start
2. Ask the user to enter any integer number.
3. After getting his number add 5 to that integer number
4. Using calculation (Number = user number + 5)
5. Double the answer of step 4.
6. Using calculation (answer = Number × 2)
7. Get the answer from step 6 and subtract from 7.
8. Using calculation (result = answer – 7)
9. Show the final result to the user.
10. End

Q – 4,

ABC company needs a weekly payroll report for its salespeople. Input to the program are the salesperson's name, number, and weekly sales. Output is the salesperson's name, number, and pay. Each salesperson receives a base weekly pay of $300 as well as a 10% commission on his or her total sales. Develop an algorithm for this.

1. Start
2. Ask the salesman to add his name, his number and his weekly sales
3. Calculate the commission for salesmen's using (commission = 10/10 × his sales)
4. After the getting commission calculate his salary using commission
5. Using calculation (salary = $ 300 + commission)
6. Show the salesman to his name, his number and his salary.
7. End

Q – 5,

Construct an algorithm to read in three values from customer's bank account: the account balance at the beginning of the month, a total of all withdrawals from the account for the month, and a total of all deposits into the account during the month. A federal tax charge of 1% is applied to all transactions made suing the month. The program is to calculate the account balance at the end of the month by

a. Subtracting the total withdrawals from the account balance at the beginning of the month,

b. Adding the total deposits to this new balance,

c. Calculating the federal tax (1% of total transactions – that is, total withdrawals + total deposits),

d. Subtracting this federal tax from the new balance.

After these calculations, print the final end-of-month balance.

1. Start
2. Ask the user to enter his account balance at the bigging of the month, his total withdrawals and his total deposits during the month.
3. After getting details from user calculate the transactions for get total transactions
4. Using calculation (total transactions = withdrawals + deposits)
5. Then calculate the federal tax fee using calculation (tax = 1/00 × total transactions)
6. After that calculate the balance of the account using calculation (balance = balance at the beginning of the month – withdrawals)
7. Get the answer from step 6 and add the deposits tom that (new balance = balance + deposits)
8. After that subtract the balance form tax using (new balance – tax)
9. After that print the final balance in the account end of that month
10. End

Q – 6, Easy

Calculate the Sum of Digits

1. Start
2. Ask the user to enter the number.
3. Set that number as “Number 1.”
4. Ask him to enter the number again.
5. Set the second number as “Number 2”
6. Repeat(loop) the step 3 or 5 if he wants to add more numbers
7. Get the sum of all numbers he entered using calculation (sum = Number 1 + Number 2……. Number n)
8. Finally print the sum of numbers
9. End

Input = Ask the user to enter the number

Number_1 = “ “

#Number_2 = “ “

Use a loop add numbers and calculate the sum of all numbers

Output = Print the sum

Q – 7,

Find the Maximum of Three Numbers

1. Start
2. Ask the user to enter three numbers.
3. Assign those numbers as" Num1, Num2, Num3"
4. Get the Num1 and compare with the Num2.
5. If Num1 is maximum add it as maximum
6. Repeat(loop) step 4 two times.
7. After comparing three numbers can get maximum number
8. End

Input = Ask the user to enter three numbers

Num_1 = " "

#Num_2 = " "

Num_3 = " "

Compare Num_1 and Num_2 to find the maximum.

Output = Print the maximum number out of three numbers

Q – 8,

Check if a Number is Prime

1. Start
2. Ask the user to add any number.
3. If user entered number divisible by 2 print and show to user "This is prime number"

4. If that number is not divisible by 2 print and show to user “This number is nor prime number”
5. End

Input = Ask the user to add any number

Number = “ “

prime = Number / 2

If it is divisible, it is prime number

If not prime number

Output = Prime number or not prime number

Q – 9,

Reverse a String

1. Start
2. Ask the user to enter the word.
3. Assign it as a (string)
4. Command the string to the reverse using command (reverse)
5. Print and show the reverse sting to the user.
6. End

Input = Ask the user to enter the word

process = reverse string (Input)

Output =Print reversed string.

Q – 10, Medium Difficulty

Implement a Simple Calculator

1. Start
2. Ask the user to enter the two numbers with the operator.
3. If he enters the '+' operator add the two numbers,
4. If he enter the '-'operator subtract the two numbers,
5. If he enters the '×' operator multiply two numbers,
6. If he enters the '/' operator divide two numbers,
7. Consider the two numbers with user entered operator and print final answer.
8. End

Input = Ask the user to enter the two numbers with the operator (num1 and num2) (+, -, ×, /)

process = calculable as step 3 – 6 with statements

Output = result after calculation

Q – 11,

Find the Largest and Smallest Numbers in a List

1. Start
2. Ask the user to enter the list of numbers.

3. Assign those numbers as" Num1, Num2, Num3…..Num n"
4. Get the Num1 and compare with the Num2.
5. If Num1 is maximum add it as maximum
6. Repeat(loop) step 4 until get the maximum number.
7. Use the same steps to get the minimum number.
8. Get the Num1 and compare with the Num2.
9. If Num1 is minimum add it as minimum
10. Repeat(loop) step 9 until get the minimum number.
11. Get maximum number from step 5 and get the minimum number form step 10 and print two numbers.
12. End

Input = Ask the user to enter the list of numbers

process = assign the numbers and compare all the numbers with each other numbers to get max and min values

Output = print maximum and minimum number

Q – 12,

Check if a String is a Palindrome

1. Start
2. Ask the user to enter any word.
3. Add the two pointers to that word.

4. One from the starting letter and other from the end letter
5. Mover those two pointers towards each other's until they meet.
6. If all the characters are completely Mach each other pointers it prints or shows to user "It is palindrome."
7. If is not shows or print as "It is not the palindrome"
8. End

Input = Ask the user to enter any word

process = Add the two pointers to starting letter and other from the end letter

Move those until it met and check the letters

Output = print the word is palindrome or not

Eg :- "abba"

Q – 13,

Generate and print the Fibonacci Sequence

1. Start
2. Ask the user to enter two numbers.
3. Compare two numbers and order that small to large numbers.
4. Assign the two numbers as "Num 1 & Num 2."
5. Add two numbers using (Answer = Num1 + Num 2)
6. Get the answer and do again same thing with answer (sum = Answer + Num 2)
7. Repeat(loop) the same thing until gets the desired number of terms.

8. End

Input = Ask the user to enter two numbers

process = assign two numbers, add two numbers and get the answer and repeat it

output = continue the loop until gets the desired number

Eg :- 1+2 (3), 2+3 (5), 3+5 (8), …….N1+N2 (Nn)

Q – 14,

Calculate the Factorial of a Number Using Recursion

1. Start
2. Ask the user to enter any number.
3. Assign that number as ("Factorial: n!"
4. Expand the number, multiply all the factorial values and all together
5. Print final result.

Input = Ask the user to enter any number

process = assign that number as factorial

If that number is 0, return it as 1

Expand the given number and multiply it and get the answer

Eg :- 5! → 5* 4 * 3 *2 *1