Lab#02

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**(i)Flowcharts:**

**1. You are working in a logistics company responsible for delivering packages. Design a flowchart**

**to manage the process of receiving, sorting, and delivering packages. Include decision**

**structures for handling fragile items and urgent deliveries.**

Any Visible Damage?

Receive Package

Yes

Note the damage and place it in the damaged area

No

Record The Package Details

Is The Package Fragile?

Yes

Label it as “Fragile” and Apply special handling

No

Is The Package Urgent?

Prioritize and sort urgent packages by destination zone

Yes

No

Sort Regular Packages By Destination Zone

Load Urgent Packages Into Vehicles

Load Regular Packages Into Vehicles

Deliver Urgent Packages

Deliver Regular Packages

Confirm Delivery And Record Status

**2.Imagine you are automating the process of a vending machine. Create a flowchart that**

**includes decision points for user input, selecting products, accepting payment, and dispensing**

**the correct item. Include error-handling for invalid inputs and insufficient funds.**

Input Selection

Is the selection valid?

No

Yes

Input Userpayment

Payment=Userpayment+Payment

Is payment>selection price

No

Yes

Change=Payment-Selection Price

Give Change

**(ii) Pseudocodes:**

**1.Write pseudocode to find the smallest number among three given variables. Implement a**

**decision-making structure to compare the variables.**

START

Set num1,num2 and num3

IF num1<num2 and num1<num3 THEN

Print “num1 is the smallest”

ELSE IF num2<num1 and num2<num3 THEN

Print”num2 is the smallest”

ELSE

Print”num3 is the smallest”

END

**3. Develop pseudocode for a basic calculator that performs multiplication and division. The**

**pseudocode should prompt the user for two numbers and an operator, then display the result**

**of the operation.**

START

Print "Enter the first number:"

INPUT num1

Print "Enter the second number:"

INPUT num2

Print "Enter the operator (\* for multiplication, / for division):"

INPUT operator

IF operator is “\*” THEN

result = num1 \* num2

Print ”Result:” + result

ELSE IF operator is ”/” THEN

IF num2 is not 0

result = num1 / num2

Print ”Result: ”+ result

ELSE Print ”Math Error”

ELSE Print ”Invalid Operator:Please enter \* or /”

END IF

**(iii)Algorithms:**

**1. Write an algorithm to determine whether a number is a prime number. The algorithm should**

**iterate through possible divisors and determine if the number has any divisors other than 1**

**and itself.**

1)Start

2)Prompt the user to enter input number **num**

3)Now initialize the divisor as **div=2**

4)Now we iterate the number by dividing it with all the available divisors **div**

5)Divide the number **num** by divisor **div**.If num%div==0(i.e, **num** is divisible by **div**), then **num** is not a prime number

6)Increase the divisor **div** by 1

7)Repeat Step 4 till **div**==**num**

8)If the number **num** has a divisor **div** other than 1 and the number itself then print “This number is not a prime number”.Else print”This number is a prime number”

9)Stop

**2. Create an algorithm that asks the user for a day number (1-365) and outputs the**

**corresponding day of the week, assuming that January 1st is a Monday.**

1)Start

2)Ask the user to input any day number(**dm**)between 1 and 365

3)Use the modulus operator and divide the day number **dm** by 7

4)If dm%7==0 then print “Sunday” on screen

5) If dm%7==0 then print “Monday” on screen

6) If dm%7==0 then print “Tuesday” on screen

7) If dm%7==0 then print “Wednesday” on screen

8) If dm%7==0 then print “Thursday” on screen

9) If dm%7==0 then print “Friday” on screen

10) If dm%7==0 then print “Saturday” on screen

11)Stop

**3. Develop an algorithm for a program that takes two numbers as input and finds the Greatest**

**Common Divisor (GCD) of the two numbers using the Euclidean algorithm.**

1)Start

2)Take two integers **num1** and **num2** as input

3)Divide the larger number by the smaller

4)If the larger number is completely divisible by the smaller number then the smaller number is the GCD of the two numbers.Go to Step 6 else go to Step 4

5)If upon division, a remainder is left then replace the larger number by the remainder and perform the division again

6)Stop