**PF-Lab**

**Assignment #1**

**Name: Ali Asghar Mohammad**

**Roll #: 24K-0780**

* **Flowcharts**
* **Pseudocodes**
* **Algorithms**
* **Github**

**Flowchart Task 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.**

End

Start

Is the Package Fragile?

Receive Package

Read package information

Is the Package Urgent?

no

yes

yes

no

Tag as “Priority delivery”

Tag as “Handle with care”

Sort package

Dispatch package information

**Flowchart Task 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.**

**Pseudocode Task 1**

Print insufficient cash

Start

Is Cash more than or equal to product price?

Enter cash

Select products

Change required?

yes

no

yes

no

Give out   
change

Change = cash - price

Dispense product(s)

End

**Write pseudocode to find the smallest number among three given variables. Implement a decision-making structure to compare the variables.**

START

INPUT num1, num2, num3

IF num1 < num2 && num1 < num3 THEN

PRINT “num1 is the smallest number”

ELSEIF num2 < num1 && num2 < num3 THEN

PRINT “num2 is the smallest number”

ELSE

PRINT “num3 is the smallest number”

ENDIF

END

**Pseudocode Task 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

SET answer to num1 \* num2

PRINT answer

ELSE IF operator is "/" THEN

SET answer to num1 / num2

PRINT answer

ENDIF

END

**Algorithm Task 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. Read number n.
3. Iterate through all possible divisors from 2 to n-1:
4. For each integer i from 2 to n-1:

If n % i == 0, then n is not a prime number. Return False.

1. If no divisors were found during the iteration, then n is a prime number. Print “n is a prime number”
2. End.

**Algorithm Task 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. Read dayNumber.
3. Check if dayNumber is between 1 and 365, if not print “invalid” and End.
4. Set dayOfWeek to (dayNumber – 1) % 7.
5. Check for the day of the week by comparing the dayOfWeek;

If dayOfWeek is 0, output “Monday”,

If dayOfWeek is 1, output “Tuesday”,

If dayOfWeek is 2, output “Wednesday”,

If dayOfWeek is 3, output “Thursday”,

If dayOfWeek is 4, output “Friday”,

If dayOfWeek is 5, output “Saturday”,

If dayOfWeek is 6, output “Sunday”

1. End.

**Algorithm Task 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. Read num1 and num2.
3. Loop until num2 is 0:

* Calculate remainder = num1 % num2
* Set num1 to num2
* Set num2 to remainder

1. When num2 is 0, GCD is the current value of num1
2. Output GCD
3. End