USER

Assignment lab # 02

Programming Fundamentals

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**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**.

FLOWCHART:

DELIVER

SORT

RECEIVE

FRAGILE

CHECK IF THE PACKAGE IS FRAGILE

RECEIVE PACKAGE

WEIGH THE PACKAGE

YES

NO

PUT FRAGILE TAG

PASS ON TO DELIVERY SECTION

RECEIVE THE CHARGES FOR DELIVERY

CHARGES FOR DELIVERY=

WEIGH\*CHARGE PER KG

DISPATCH AS SOON AS POSSIBLE

URGENT DELIVERY

CHECK THE DELIVERY DATE OF THE PACKAGE

STORE THE PACKAGE

NO

YES

**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.**

FLOWCHART:

PAYMENT

DISPERSION

SELECTION

DISPLAY MESSAGE “INVALID INPUT

CODE IS CORRECT

CHECK THE CODE FOR PRODCUT ENTERED BY THE USER

INPUT CODE OF PRODUCT YOU WANT

CHECK THE PRODUCT CODE

DISPENSE PRODUCT

RETURN CHANGE

DISPLAY MESSAGE

“PAYMENT SUCCESFUL”

DISPLAY MESSAGE “INVALID NOE”

AMOUNT - PAYMENT = CHANGE

PAYMENT <= AMOUNT

CHECK IF NOTE IS VALID

TAKE AMOUNT FROM USER

DISPLAY AMOUNT OF SELECTED PRODUCTS BY THE USER

**PSEUDO CODE**

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

**PSUEDO CODE**

1. START
2. INPUT NUMBER 1 AND SET VARIABLE A TO NUMBER 1
3. INPUT NUMBER 2 AND SET VARIABLE B TO NUMBER 2
4. INPUT NUMBER 3 AND SET VARIABLE C TO NUMBER 3

CONDITIONAL STATEMENTS OD DECISION MAKING

1. IF **A < B** AND **A < C**

**PRINT** “A IS THE SMALLEST AMONG THE THREE VARIABLES”

1. ELSE IF **B < C** AND **B < A**

**PRINT** “B IS THE SMALLEST AMONG THE THREE VARIABLES”

1. ELSE

**PRINT** “C IS THE SMALLEST AMONG THE THREE VARIABLES”

1. END
2. **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.**

**PSEUDO CODE**

1. START
2. SET SOLUTION = 0
3. INPUT NUMBER 1
4. INPUT NUMBER 2
5. INPUT OPERATOR
6. IF OPERATOR INSERTED IS \*

THEN SOLUTION = NUMBER 1 \* NUMBER 2

1. ELSE IF OPERATOR INSERTED IS /

THEN SOLUTION = NUMBER 1 / NUMBER 2

1. ELSE

PRINT OPERATOR NOT IDENTIFIED

**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.**

**ALGORITHM**

STEP 1: START

STEP 2: INPUT NUM

STEP 3: FOR (N=2; N<NUM;N++)

STEP 4: { IF NUM%N=0

STEP 5: PRINT N }

STEP 6: IF N>2

STEP 7: THEN PRINT “NUM IS NOT PRIME NUMBER”

STEP 8: ELSE PRINT “NUM IS PRIME NUMBER”

STEP 9: END

1. **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.**

**ALGORITHM**

STEP 1: START

STEP 2: INPUT DAY NUMBER

STEP 3: SET DAY OF THE WEEK = DAY NUMBER % 7

STEP 4: IF DAY OF THE WEEK = 1 PRINT “MONDAY”

STEP 5: ELSE IF DAY OF THE WEEK = 1 PRINT “MONDAY”

STEP 6: ELSE IF DAY OF THE WEEK = 2 PRINT “TUESDAY”

STEP 7: ELSE IF DAY OF THE WEEK = 3 PRINT “WEDNESDAY”

STEP 8: ELSE IF DAY OF THE WEEK = 4 PRINT “THURSDAY”

STEP 9: ELSE IF DAY OF THE WEEK = 5 PRINT “FRIDAY”

STEP 10: ELSE IF DAY OF THE WEEK = 6 PRINT “SATURDAY”

STEP 11: ELSE DAY OF THE WEEK = 0 PRINT “SUNDAY”

STEP 12: END

1. **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.**

**ALGORITHM**

STEP 1: START

STEP 2: INPUT NUM1

STEP 3: INPUT NUM2

STEP 4: SET R = 0

STEP 5: IF NUM2 = 0, GO TO STEP 9

ELSE GO TO STEP 6

STEP 6: R = NUM1 % NUM2

STEP 7: CHANGE NUM1 TO NUM2 AND CHANGE NUM2 TO R

STEP 8: CHECK IF B == 0, THEN GO TO STEP 9, ELSE GOT TO STEP 6

STEP 9: PRINT “A IS THE GCD OF BOTH NUMBERS”

STEP 10: END