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**Lab 2 Tasks:**

1. **Find if the number is multiple of 5.**

INPUT number

IF number MOD 5 = 0 THEN

OUTPUT "The number is a multiple of 5."

ELSE

OUTPUT "The number is not a multiple of 5."

END IF

1. **Check if a character is uppercase or lowercase.**

INPUT character

IF character >= 'A' AND character <= 'Z' THEN

OUTPUT "Character is uppercase."

ELSE IF character >= 'a' AND character <= 'z' THEN

OUTPUT "Character is lowercase."

ELSE

OUTPUT "Character is not a letter."

END IF

1. **Create a small calculator which only does ‘+’ or ‘\*‘Operations. (Hint: Take three variable inputs with one being used for the operator)**

INPUT number1

INPUT number2

INPUT operator

IF operator = "+" THEN

result = number1 + number2

ELSE IF operator = "\*" THEN

result = number1 \* number2

ELSE

OUTPUT "Invalid operator."

STOP

END IF

OUTPUT result

1. **Check whether a given number is positive, negative, or zero.**

INPUT number

IF number > 0 THEN

OUTPUT "The number is positive."

ELSE IF number < 0 THEN

OUTPUT "The number is negative."

ELSE

OUTPUT "The number is zero."

END IF

1. **Determine if a person is a teenager (between 13 and 19 years old).**

INPUT age

IF age >= 13 AND age <= 19 THEN

OUTPUT "Person is a teenager."

ELSE

OUTPUT "Person is not a teenager."

END IF

1. **Implement an algorithm to determine if a given year is a leap year. A leap year is divisible by 4, but not divisible by 100, except if it is also divisible by 400.**

INPUT year

IF year MOD 400 = 0 THEN

OUTPUT year + " is a leap year."

ELSE IF year MOD 100 = 0 THEN

OUTPUT year + " is not a leap year."

ELSE IF year MOD 4 = 0 THEN

OUTPUT year + " is a leap year."

ELSE

OUTPUT year + " is not a leap year."

1. **Implement an algorithm to count the number of occurrences of each character in a given string.**

INPUT string

FOR i FROM 0 TO 255

character\_count[i] = 0

END FOR

FOR i FROM 0 TO LENGTH OF string - 1

character = string[i]

index = ASCII value of character

character\_count[index] = character\_count[index] + 1

END FOR

FOR i FROM 0 TO 255

IF character\_count[i] > 0 THEN

OUTPUT CHARACTER WITH ASCII value i + ": " + character\_count[i]

END IF

END FOR

1. **Write an algorithm to calculate x raised to the power y (i.e., x y ) without using built-in power functions.**

INPUT x, y

result = 1

FOR i FROM 1 TO y

result = result \* x

END FOR

OUTPUT result

1. **Calculate the area of a circle given its radius r.**

INPUT r

pi = 3.14159

area = pi \* r \* r

OUTPUT area

1. **Find the median of three given numbers.**

INPUT a, b, c

IF a > b THEN

SWAP a AND b

END IF

IF a > c THEN

SWAP a AND c

END IF

IF b > c THEN

SWAP b AND c

END IF

median = b

OUTPUT median