# Homework 2 Selection Answers

# 1. Write pseudocode for a program that prompts a user to enter their name. If the name is “Hazel” then output “Hello Hazel”. If the name is not Hazel, output “We haven’t met, “ *name*, “pleased to meet you.”

# OUTPUT “Enter your name”

Name 🡨 USERINPUT

IF name = “Hazel” THEN

OUTPUT “Hello Hazel”

ELSE

OUTPUT “We haven’t met,” name, “ pleased to meet you”

END IF

# [4]

# 2. Complete the following pseudocode for a program that prompts the user to input a temperature reading and humidity reading. If the temperature is greater than 25 or humidity is greater than 50% and window is closed then output a message “Open the window”. If the temperature is below 10, the humidity is below 50% and the window is not closed, output a message “Close the window”.

# OUTPUT “Enter the temperature”

# temp 🡨 USERINPUT

# OUTPUT “Enter the humidity”

# humidity 🡨 USERINPUT

# IF window = “closed” THEN

# IF temp > 25 OR humidity > 50 THEN

# OUTPUT “Open the window”

END IF

# ELSE

IF temperature < 10 AND humidity < 50 THEN

OUTPUT “Close the window”

END IF

# END IF [4]

# 3. A pseudocode program that measures pH levels is shown below. The pH scale runs from 0 to 14. Read the code below and complete the trace tables with the values given.

pH 🡨 0

OUTPUT “Enter pH level”

pH 🡨 USERINPUT

IF pH > -1 and pH < 7 THEN

OUTPUT “pH is acidic”

ELSE IF pH = 7 THEN

OUTPUT “pH is neutral”

ELSE IF pH > 7 and pH < 15 THEN

OUTPUT “pH is basic”

ELSE

OUTPUT “Error... enter a number from 0 to 14”

ENDIF

Complete the trace tables below with the values -1, 0, 7, 14 and 15

|  |  |
| --- | --- |
| **pH** | **Output** |
| -1 | Error... Enter a number from 0 to 14 |
|  |  |
| **pH** | **Output** |
| 0 | pH is acidic |
|  |  |
| **pH** | **Output** |
| 7 | pH is neutral |
|  |  |
| **pH** | **Output** |
| 14 | pH is basic |
|  |  |
| **pH** | **Output** |
| 15 | Error... Enter a number from 0 to 14 |

[5]

4. Complete the following pseudocode program.

The program prompts the user to select a choice

A: Multiply

B Divide

C Add

D Subtract

E Remainder Division *(use the mod function for this)*

The program will then prompt the user to enter two numbers and perform the chosen operation. The answer should then be printed to the screen. If the user does not enter a valid choice, output a message “You did not enter a valid choice”.

Use a CASE statement for this task.

OUTPUT “Select one of the following options”

OUTPUT “Enter A for Multiply”

OUTPUT “Enter B for Divide”

OUTPUT “Enter C for Add”

OUTPUT “Enter D for Subtract”

OUTPUT “Enter E for Remainder Division”

*add statements here* [4]

OUTPUT “Enter number 1”

number1 🡨 USERINPUT

OUTPUT “Enter number 2”

number2 🡨 USERINPUT

CASE choice OF

A :answer 🡨 number1 \* number2

B :answer 🡨 number1 / number2

C :answer 🡨 number1 + number2

D :answer 🡨 number1 - number2

E :answer 🡨 number1 MOD number2

ELSE

OUTPUT “You did not enter a valid choice”

ENDCASE

OUTPUT answer

5. The following pseudocode is designed to output a message to say whether a particular year input by the user is a Leap Year.

(i) Add statements to complete the algorithm, displaying whether or not the year input by the user is a Leap Year; e.g. “2015 is not a Leap Year” [3]

*(add statements here to ask use to input a Year)*

OUTPUT (“Please enter a year, e.g. 2015: ”)

Year 🡨 USERINPUT

LeapYear 🡨 FALSE

IF (mod(Year, 4) = 0) THEN

LeapYear 🡨 TRUE

END IF

IF (mod(Year,100) = 0) THEN

LeapYear 🡨 FALSE

END IF

IF (mod (Year,400) = 0) THEN

LeapYear 🡨 TRUE

END IF

*(add statements here to output appropriate message)*

IF LeapYear = TRUE THEN

OUTPUT (Year, “is a Leap Year”)

ELSE

OUTPUT (Year, “is not a Leap Year”)

(ii) Why is it necessary to include the statement

LeapYear 🡨 FALSE

near the start of the program? [1]

If the Year is not divisible by 4 (and therefore not by 100 or 400), all the conditions in the IF statements will evaluate to FALSE and LeapYear will be undefined, giving an error in the last statement.

(ii) Complete the following table of test data and expected results. [4]

|  |  |
| --- | --- |
| **Year** | **Expected output** |
| 1800 | FALSE |
| 1986 | FALSE |
| 2000 | TRUE |
| 2016 | TRUE |

[Total 25 Marks]