Programming Fundamentals

Assignment #1

Q1. Write a pseudocode for a program that takes an input of Sales made by the Salesman for the month and calculates his salary, 15% of the total Sale.

```
DECLARE  Real  total_sales, Salary
INPUT    total_sales
Salary = 0.15 * total_Sales
DISPLAY  "Your Total Salary is "  &  Salary
```

Q2. Write a psuedo.... reciprocal of nonzero entered by user, stores it & prints it.

```
DECLARE  Real   num1, num2
WHILE    num1 != 0
  INPUT  num1
  num2 = 1 / num1
END WHILE
DISPLAY "Reciprocal of "  &  num1  &  " is "  &  num2
```

(Q3 done at end)

Q4. write... takes 2 numbers as input from user, swaps them <u>without</u> using any third variable. [use basic + & -]

```
DECLARE  Integer  num1, num2
  Input  num1
  Input  num2
num1 = num1 + num2
num2 = num1 - num2
num1 = num1 - num2
DISPLAY  Num1
DISPLAY  num2
```

```
// eg. 4+3=7
// 7-3=4   } swapped
//  7-4=3
```

Q5) ... code that asks user final percentage and assigns grade according to the Plan:

$\geq 80 \rightarrow A$

$70 \leq x \leq 80 \rightarrow B$

$60 \leq x \leq 70 \rightarrow C$

$50 \leq x \leq 60 \rightarrow D$

less than 50 $\rightarrow$ F

```
DECLARE Integer percentage
DECLARE character grade

  Input Percentage

    IF percentage ≥ 80
    THEN grade = 'A'
    ELSEIF percentage ≥ 70
    THEN grade = 'B'
    ELSEIF percentage ≥ 60
    THEN grade = 'C'
    ELSEIF percentage ≥ 50
    THEN grade = 'D'
    ELSE grade = 'F'  // no other condition met
  ENDIF
  DISPLAY grade
```

Q6) ... code that implements 2nd equation of motion to compute distance s. All other parameters are input from user.

```
DECLARE real dist, acc, time, iVel, S1, S2
  INPUT iVel          // initial velocity
  INPUT acc
  INPUT time
   S1 = iVel * time
   S2 = 0.5 * acc * time^2
   dist = S1 + S2
DISPLAY dist
```

Q7) A can... i) must be under the age of 20, not appeared in the test before.

ii) FSC pre. eng ≥ 60%, other diploma ≥ 70%, Alevels min 2A's.

```
DECLARE INTEGER Age, degree
DECLARE REAL FSC_percentage, other_percentage
DECLARE STRING Status, appeared
DECLARE CHARACTER grade1, grade2, grade3
DECLARE BOOLEAN Status
DISPLAY "Have You appeared in this test before? (Yes/No)"
  INPUT appeared
DISPLAY "ENTER YOUR AGE:"
  INPUT AGE
  WHILE AGE ≤ 20 AND appeared == "No"
    DISPLAY "ENTER YOUR LAST ACADEMIC QUALIFICATION;
             1 FOR FSC, 2 FOR OTHER EQUIVILANT DIPLOMA, 3 FOR A LEVELS."
     INPUT degree
    CASE OF degree
    1 : DISPLAY "ENTER MARKS PERCENTAGE"
      INPUT FSC_percentage
    IF FSC_percentage ≤ 60
    THEN DISPLAY "NOT ELIGIBLE"
    END IF
  2: DISPLAY "ENTER OBTAINED MARKS PERCENTAGE"
   INPUT other_percentage
   IF other_percentage ≤ 70
   THEN DISPLAY "NOT ELIGIBLE"
   END IF
  3: DISPLAY "ENTER 3 BEST GRADES; INCASE OF A*, ENTER A."
   INPUT grade1, grade2, grade3
    IF grade1 AND grade2 != 'A' OR grade2 AND grade3 != 'A'
       OR grade1 AND grade3 != 'A'
    THEN DISPLAY "NOT ELIGIBLE"
    END IF
  ENDCASE
 DISPLAY "HAVE YOU REGISTERED & ALREADY PAID?"
   INPUT STATUS
 WHILE STATUS == "YES"
    DISPLAY "Admission test appearance slip has been sent to you"
 END WHILE
END WHILE
```

Q8) write a code ... Denary → Binary.

```
DECLARE INTEGER, NUM, BINARY, REM, PlaceVal
BINARY = 0        PLACE = 1 ──→ INPUT NUM        //initialization
WHILE NUM != 0
    REM = Num MOD 2                    // divides by 2, remainder stored
    Num = Num / 2                      // updating no for next loop
    BINARY = BINARY + (REM * placeval)
    Placeval = PlaceVal * 10           // takes to next place value
ENDWHILE
DISPLAY "THE NUMBER " & Num & " IN BINARY IS " & BINARY.
```

Q9) .. input from user ... check it its prime or not.

```
DECLARE INTEGER Num, INDEX
DECLARE BOOLEAN FLAG
    INDEX = 2
    INPUT Num
    FLAG = FALSE
WHILE FLAG = FALSE AND INDEX ≤ Num-1
    IF NumMODINDEX == 0
    THEN FLAG = TRUE
    ELSE INDEX = INDEX + 1
END WHILE
IF FLAG == TRUE
THEN DISPLAY "Number is NOT prime"
ELSE DISPLAY "Number is Prime"
```

Q10) takes an alphabet as input from the user, checks wheather it is a vowel ... repitition..

```
DECLARE CHARACTER A
DECLARE BOOLEAN FOUND
FOUND = FALSE
WHILE FOUND ==FALSE
  INPUT A
  A = LCASE(A)        // converts any input to lower case
  IF A = 'a' OR A = 'e' OR A = 'i' OR A = 'o' OR A = 'u'
  THEN FOUND = TRUE
  ENDIF
END WHILE
DISPLAY "VOWEL FOUND"
```

Q3) write a psuedocode ... takes input from user the current date & users date of birth and calculates his age.

```
DECLARE INTEGER  currentyear, Birthyear, calculatedyear,
                 currentmouth, Birthmouth, calculatedmouth,
                 currentday, Birthday, calculated day, daysinmouth

DISPLAY "Enter current date, mouth & year"
INPUT   currentday
INPUT   current mouth
INPUT   currentyear
DISPLAY "Enter birthdate, mouth, & year"
INPUT   Birthday
INPUT   Birth Mouth
INPUT   Birth year
Calculated Year = current year - Birth year
  IF Birthmouth > current month
  THEN  currentyear = current year - 1
   Calculated Mouth = Birthmouth - current mouth
   Calculated mouth = 12 - Calculated Mouth
   ELSE  calculated Mouth = currentmouth - Birthmouth
  ENDIF

  IF  current Mouth = 1 OR currentmouth = 3 OR currentmouth = 5
     OR current mouth = 7 OR arrentmouth = 8 OR current mouth = 10
     OR  current mouth = 12
  THEN  days in month = 31
ELSEIF  current month = 2      THEN  days in month = 28
  ELSE  days in mouth = 30
  END IF

  IF   Birthday > current day
  THEN  Calculated mouth = Calculated mouth - 1
   Calculated day = birthday - current day
   Calculated day = days in month - Calculated day
  ELSE  Calculated day = current day - Birthday
  END IF
  DISPLAY "You are " & calculated year & " years old," &
  Calculated month & " month; and " & "calculated days & "days."
```