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Written Assignment 1

Multiplication

1. Inputs
   poundApples - How many pounds of apples were purchased
   priceApples - The price of apples per pound
2. Output
   totalPrice - The total price of all the apples purchased
3. Error Conditions
   poundApples and priceApples both have to be positive numbers
4. Algorithm
   READ poundApples
   IF poundApples is negative
   DISPLAY please enter a positive number
   READ poundApples
   ELSE IF poundApples is not a number
   DISPLAY please enter a positive number
   READ poundApples
   ENDIF
   READ priceApples
   IF priceApples is negative
   DISPLAY please enter a positive number
   READ priceApples
   ELSE IF priceApples is not a number
   DISPLAY please enter a positive number
   READ priceApples
   ENDIF
   COMPUTE poundApples * priceApples as totalPrice
   DISPLAY totalPrice
5. Minimum and Maximum Operations
   Minimum - 4 Operations
   Maximum - 11 Operations
6. Test Cases
   5, 1 - 5
   4, .50 - 2
   9, 3 - 27
   apple - please enter a positive number
   -5 - please enter a positive number
   7, four - please enter a positive number

Gas

1. Inputs
   priceGas - the price of the gas per gallon
   gallons - the number of gallons filled
   credit - whether or not a credit card was used
2. Outputs
   totalPrice - the total amount owed for the gas
3. Error Conditions
   priceGas and gallons both have to be positive numbers
   credit must be either yes or no
4. Algorithm
   READ priceGas
   IF priceGas is negative
   DISPLAY please enter a positive number
   READ priceGas
   ELSE IF priceGas is not a number
   DISPLAY please enter a positive number
   READ priceGas
   ENDIF
   READ gallons
   IF gallons is negative
   DISPLAY please enter a positive number
   READ gallons
   ELSE IF gallons is not a number
   DISPLAY please enter a positive number
   READ gallons
   ENDIF
   READ credit
   IF credit is not yes or no
   DISPLAY please enter yes or no
   READ credit
   ENDIF
   COMPUTE totalPrice as priceGas * gallons
   IF credit is yes
   COMPUTE totalPrice as totalPrice * 1.1
   DISPLAY totalPrice
   ELSE IF credit is no
   DISPLAY totalPrice
   ENDIF

5. Minimum and Maximum Operations
   Minimum - 6 Operations
   Maximum - 16 Operations
6. Test Cases
   2, 15, no - 30
   2.85, 22, yes - 68.97
   Four - please enter a positive number
   3.19, -3 - please enter a positive number
   8.56, 27, 7 - please enter yes or no

University Tuition

7. Inputs
   credits - number of credits being taken
   creditCost - price of credits
   uniEmployee - whether or not the student is a university employee
   stateEmployee - whether or not the student is a state employee
   installments - whether or not the student is paying in installments
8. Outputs
   tuition - total tuition
9. Error Conditions
   credits must be a positive number
   uniEmployee, stateEmployee, and installments all must be yes or no
10. Algorithm

```
READ credits
IF credits is negative
        DISPLAY please enter a positive number
        READ credits
ELSE IF credits is not a number
        DISPLAY please enter a positive number
        READ credits
ENDIF
SET creditCost to credits * 20
READ uniEmployee
IF uniEmployee is not yes or no
        DISPLAY please enter yes or no
        READ uniEmployee
ENDIF
IF uniEmployee is no
        READ stateEmployee
        IF stateEmployee is not yes or no
                DISPLAY please enter yes or no
                READ stateEmployee
        ENDIF
ELSE
        SET stateEmployee to no
ENDIF
READ installments
IF installments is not yes or no
        DISPLAY please enter yes or no
```

READ installments
ENDIF
SET tuition to 6.87
IF uniEmployee and stateEmployee is no
SET tuition to tuition + creditCost
ENDIF
IF stateEmployee is yes
SET tuition to tuition + (.1 * creditCost)
ENDIF
IF installments is yes
SET tuition to tuition * 1.03
ENDIF
DISPLAY tuition

11. Minimum and Maximum Operations
    Minimum - 12 Operations
    Maximum - 24 Operations
12. Test Cases
    5, no, no, no - 106.87
    10, no, no, yes - 213.0761
    20, yes, no, no - 6.87
    -5 - please enter a positive number
    6, 11 - please enter yes or no
    15, no, (yes) - please enter yes or no

Zoo Census

13. Inputs
    numZoos - number of zoos
    numGiraffes - number of giraffes
    numLions - number of lions
    numSnakes - number of snakes
14. Outputs
    totalGiraffes - total giraffes
    totalLions - total lions
    totalSnakes - total snakes
15. Error Conditions
    None (assuming that only positive numbers are inputted
16. Algorithm
    READ numZoos
    FOR numZoos number of times
        //calculating number of giraffes in a particular zoo
        READ numGiraffes
        ADD numGiraffes to totalGiraffes

        //calculating number of lions in a particular zoo
        READ numLions
        ADD numLions to totalLions

        //calculating number of snakes in a particular zoo
        READ numSnakes
        ADD numSnakes to totalSnakes
    ENDFOR
    DISPLAY totalGiraffes, totalLions, totalSnakes
17. Minimum and Maximum Operations
    Minimum - 2 Operations
    Maximum - (numZoos * 6) + 2 Operations
18. Test Cases
    2, 1, 2, 3, 1, 2, 3 - 2, 4, 6
    5, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2 - 10, 10, 10