**The City School**

North Nazimabad Boys Branch

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Class: 10 & 11
Subject: Computer Science
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Q1: Show two ways of selecting different actions using Pseudocode.

Ans:

**If Condition**

Begin

Input grade

 If grade >= 60

Then Print "passed"

Else Print "failed"

End If

End

**Case Statement**

Begin

Input grade

CASE  grade  OF
                ‘A’       : points = 4
                ‘B’       : points = 3
                ‘C’       : points = 2
                ‘D’       : points = 1
                ‘F’       : points = 0

 ENDCASE

Output points

End

Q2: You have been asked to choose the correct routine from the menu shown below.

1. Decide which type of conditional statement are you going to you use.
2. Explain your choice.
3. Write the Pseudocode
4. Select your test data and explain why you choose each value.

Answer:

1. I am using Case Statement
2. because it is very simple and relevant to use in the given scenario.
3. Pseudocode:

Begin

Input Choice

Case Choice of

 1 : SetUpNewAccount;

 2 : MakeChangesToAnExistingAccount;

 3: CloseAnAccount;

4 : ViewMyOrders;

5 : PlaceANewOrder;

6 : AlterAnExistingOrder;

0 : Exit;

H : Help;

End Case

End

Q3: Show three ways to use a loop to add up five numbers and print out the total can be set up using Pseudocode. Explain which loop is the most efficient to use.

Answer:

There are three different loop structures that we can use to add five numbers.

1. By Using For Loop

Begin

Sum=0

For Count = 1 to 5

Input Num

Sum = Sum + Num

Next Count

Output “Total = ”, Sum

End

1. By Using Repeat Until Loop

Begin

Sum=0

Count = 0

Repeat

Input Num

Sum = Sum + Num

Count = Count + 1

Until Count = 5

Output “Total = ”, Sum

End

1. By Using While Do EndWhile Loop

Begin

Sum=0

Count = 0

While Count<5 Do

Input Num

Sum = Sum + Num

Count = Count + 1

EndWhile

Output “Total = ”, Sum

End

Q4: A sweets shop sells five hundred different types of sweets. Each sort of sweet is identified by a different four digit code. All sweets that start with 1 are Chocolates, All sweets that start with 2 are toffees, All sweets that start with 3 are jellies and all other sweets are miscellaneous and can start with any other digit except zero.

1. Write an algorithm, using a flowchart or Pseudocode which input the four digit code for all 500 items and output the number of chocolates, toffees and jellies.
2. Explain how you would test your flow chart.
3. Decide the test data to use and complete a trace table showing a dry run of your flow chart.

Answer:

Begin

TotalChocolate = 0

TotalToffees = 0

TotalJellies = 0

For Count = 1 to 500

Input Code

If Code >= 1000 And Code <=1999

Then TotalChocolate = TotalChocolate + 1

Else

 If Code >= 2000 And Code <=2999

Then TotalToffees = TotalToffees + 1

Else

 If Code >= 3000 And Code <=3999

Then TotalJellies = TotalJellies + 1

 End If

End If

End If

Next Count

Output “Total Number Of Chocolates :” , TotalChocolate

Output “Total Number Of Chocolates :” , TotalToffees

Output “Total Number Of Jellies :” , TotalJellies

End

Q5: The temperature in an apartment must be kept between 18⁰C and 20⁰C. If the temperature reaches 22⁰C then the fan is switched On; If the temperature reaches 16⁰C then the heater is switched On; otherwise the fan and the heater are switched Off. The following library routines are available:

* GetTemperature
* FanOn
* FanOff
* HeaterOn
* HeaterOff

Write an algorithm using Pseudocode or flow chart, to keep the temperature at the right level.

Begin

Input Temperature

If Temperature >= 22

Then FanOn;

Else

 If Temperature <= 16

Then HeaterOn;

Else

 FanOff;

 HeaterOff;

End If

End If

End

Q6: Daniel lives in Italy and travels to Mexico, India and New Zealand. The time difference are:

|  |  |  |
| --- | --- | --- |
| Country | Hours  | Minutes |
| Mexico | -7 | 0 |
| India | +4 | +30 |
| New Zealand | +11 | 0 |

Thus, If it is 10:15 in Italy it will be 14:45 in India.

1. Write an algorithm which:
* Inputs the name of the country
* Inputs the time in Italy in hours and in minutes
* Calculate the time in the country input using the data from the table
* Output the country and the time in hours and in minutes.
1. Describe with examples two sets of test data you would use to test your algorithm.

a)

Begin

Input Country, Hours, Minutes

If Country = “Mexico”

Then Hours = Hours - 7

Else

 If Country = “India”

Then Hours = Hours + 4

 Minutes = Minutes + 30

 If Minutes > = 60

 Minutes = Minutes – 60

 Hours = Hours + 1

 End If

Else

 If Country = “New Zealand”

Then Hours = Hours + 11

End If

End If

End If

End

Q7: A school is doing a check on the heights and weights of the students. The school has 1000 students. Write a Pseudocode and program in VB, which:

* Input height and weight of all 1000 students
* Output the average height and weight
* Include any necessary error traps for the input

Begin

TotalWeight =0

TotalHeight =0

For x= 1 to 1000

Repeat

Input height, weight

Until (height > 30) and (height < 80) and (weight > 30 ) and ( weight < 100)

TotalWeight = TotalWeight + weight

TotalHeight = TotalHeight + height

Next

AverageHeight = TotalHeight / 1000

AverageWeight = TotalWeight / 1000

Output “ Average height of the students is : ”, AverageHeight

Output “ Average weight of the students is : ”, AverageWeight

End

Q8: A small café sells five types of items:

Bun $0.50

Coffee $1.20

Cake $1.50

Sandwich $2.10

Dessert $4.00

Write a program, which

* Input every item sold during the day
* Uses an item called “end” to finish the day’s input
* Adds up the daily amount taken for each type of item
* Outputs the total takings ( for all items added together ) at the end of the day
* Output the item that had the highest takings at the end of the day

**Pseudocode**

Begin

Tbun =0

Tcoffee =0

 Tcake =0

 Tsandwich = 0

 Tdessert =0

HighestTaking = 0

Repeat

Input Item, quantity

Case Item of

 “bun” : Tbun = Tbun + quantity

 “coffee” : Tcoffee = Tcoffee + quantity

 “cake” : Tcake = Tcake + quantity

 “sandwich” : Tsandwich = Tsandwich + quantity

 “dessert” : Tdessert = Tdessert + quantity

 Otherwise Output “ Enter relevant product ”

End Case

Until Item = “End”

TotalTakings = Tbun + Tcoffee + Tcake + Tsandwich + Tdessert

Output “The total takings of the whole day” , TotalTakings

If (Tbun > HighestTaking) Then

HighestTaking = Tbun

 Item = “Bun”

End If

If (Tcoffee > HighestTaking) Then

HighestTaking = Tcoffee

 Item = “Coffee”

End If

If ( Tcake > HighestTaking) Then

HighestTaking = Tcake

 Item = “Cake”

End If

If ( Tsandwich > HighestTaking) Then

HighestTaking = Tsandwich

 Item = “Sandwich”

End If

If (Tdessert > HighestTaking) Then

HighestTaking = Tdessert

 Item = “Dessert”

End If

Output “The item which has the highest sales today is : ” , Item

End

VB program

Module Module1

Sub Main( )

Dim Tbun, Tcoffee, Tcake, Tsandwich, Tdessert, quantity, TotalTakings, HighestTaking As Integer

Tbun =0

Tcoffee =0

 Tcake =0

 Tsandwich = 0

 Tdessert =0

Dim Item As String

Do

Console.writeline ( “Enter the item in lower case only”)

Item = console.readline( )

Console.writeline ( “Enter its quantity”)

quantity = Int(console.readline( ))

Select Item

 Case “bun”

 Tbun = Tbun + quantity

Case “coffee”

 Tcoffee = Tcoffee + quantity

 Case “cake”

 Tcake = Tcake + quantity

Case “sandwich”

 Tsandwich = Tsandwich + quantity

 Case “dessert”

 Tdessert = Tdessert + quantity

 Case Else

 Console.writeline(“ Enter relevant product ”)

End Select

Loop Until ( Item = “End” )

TotalTakings = Tbun + Tcoffee + Tcake + Tsandwich + Tdessert

Console.writeline(“The total takings of the whole day” & TotalTakings)

If (Tbun > HighestTaking) Then

HighestTaking = Tbun

 Item = “Bun”

End If

If (Tcoffee > HighestTaking) Then

HighestTaking = Tcoffee

 Item = “Coffee”

End If

If ( Tcake > HighestTaking) Then

HighestTaking = Tcake

 Item = “Cake”

End If

If ( Tsandwich > HighestTaking) Then

HighestTaking = Tsandwich

 Item = “Sandwich”

End If

If (Tdessert > HighestTaking) Then

HighestTaking = Tdessert

 Item = “Dessert”

End If

Console.writeline(“The item which has the highest sales today is : ” & Item)

Console.readkey( )

End Sub

End Module

Q9: 5000 numbers are being input which should have either one digit, two digits, three digits or four digits. Write an algorithm which:

* Input 5000 numbers
* Output how many numbers have one digit, two digits, three digits and four digits.
* Output the percentage of numbers which were outside the range.

Begin

OneDigit = 0

TwoDigit = 0

ThreeDigit = 0

FourDigit = 0

OutSide = 0

For Count = 1 to 500

Input Number

If Number >= 0 And Number <=9

Then OneDigit = OneDigit + 1

Else

 If Number >= 10 And Number <=99

Then TwoDigit = TwoDigit + 1

Else

 If Number >= 100 And Number <=999

Then ThreeDigit = ThreeDigit + 1

Else

If Number >= 1000 And Number <=9999

Then FourDigit = FourDigit + 1

Else

 OutSide = OutSide + 1

End If

 End If

End If

End If

Next Count

Percentage = OutSide / 5000 \* 100

Output “Total Number Of One Digit Numbers :” , OneDigit

Output “Total Number Of Two Digit Numbers :” , TwoDigit

Output “Total Number Of Three Digit Numbers :” , ThreeDigit

Output “Total Number Of Four Digit Numbers :” , FourDigit

Output “Percentage of numbers outside the range” , Percentage

End