Module Code: COS1511

Assessment: Assignment 1

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QUESTION 1

#include <iostream>

using namespace std;

int main()

{ //Variables

int mFactor, flour=2, bakingpowder=3, lemonzest=1, egg=1;

float sugar=0.5, salt=0.5, milk=0.75, oil=0.25 ;

cout<<("Please enter the factor to multiply the ingredients with : ");

cin>>mFactor;

flour=flour\*mFactor, bakingpowder=bakingpowder\*mFactor, lemonzest=lemonzest\*mFactor,

egg=egg\*mFactor, sugar=sugar\*mFactor, salt=salt\*mFactor, milk=milk\*mFactor, oil=oil\*mFactor;

cout<< "Recipe for Lemon Muffins " << endl;

cout<<"Ingredients: "<<endl;

cout<< flour << " cups of all-purpose flour "<< endl;

cout<< bakingpowder << " teaspoons of baking powder "<< endl;

cout<< lemonzest << " tablespoons of grated lemon zest "<< endl;

cout<< egg << " eggs "<< endl;

cout<< sugar << " cups of sugar "<< endl;

cout<< salt << " teaspoons of salt "<< endl;

cout<< milk << " cups of milk"<< endl;

cout<< oil << " cups of vegetable oil"<< endl;

cout<<endl;

cout<<"Method: "<<endl;

cout<<"1. Heat oven to 400 degrees F (205 degrees C). Grease bottoms only of 12 muffin cups or line with baking cups."<<endl;

cout<<"2. In a medium bowl, combine flour, sugar, baking powder, lemon zest and salt; mix well."<<endl;

cout<<"3. In a small bowl, combine milk, oil and egg and blend well"<<endl;

cout<<"4. Add dry ingredients all at once; stir just until dry ingredients are moistened (batter will be lumpy.)"<<endl;

cout<<"5. Fill cups 2/3 full, bake for 20 to 25 minutes or until toothpick inserted in center comes out clean."<<endl;

cout<<"6. Cool 1 minute before removing from pan and serve warm."<<endl;

return 0;

}

Text

Description automatically generated

Question 2

#include <iostream>

using namespace std;

int main()

{

//Variables

int nrPupils = 56, nrGroups, nrLeft, groupSize;

cout<< "Please enter the size of each group?" << endl;

cin>>groupSize;

//Calculate the group size

nrGroups=nrPupils/groupSize;

//Calculate the pupils left over

nrLeft=nrPupils%groupSize;

//Display output

cout << "There are "<<nrGroups<< " groups consisting of " << groupSize << endl;

cout << "pupils, There are " << nrLeft <<" remaining pupils" ;

return 0;

}

Text

Description automatically generated

Question 3

#include <iostream>

using namespace std;

int main()

{ //Variables

float var1, var2;

char operation;

//Getting input from user

cout<<"Please enter the first float value: ";

cin>>var1;

cout<<"Please enter the second value: ";

cin>>var2;

cout<<"Please enter the operation required : ";

cin>>operation;

//Getting output to 2 decimal points only

cout.setf(ios::fixed);

cout.precision(2);

//If statements

if (operation=='+')

cout << "The sum of " << var1 << " and " << var2 << " is " << var1+var2;

else if (operation=='-')

cout << "The difference of " << var1 << " and " << var2 << " is " << var1-var2;

else if (operation=='\*')

cout << "The product of " << var1 << " and " << var2 << " is " << var1\*var2;

else if (operation=='/')

if(var2==0)

cout<< "Error, cannot divide by 0";

else

cout << "The quotient of " << var1 << " and " << var2 << " is " << var1/var2;

// else if (operation=='%')//Modulus is not supported on float variables so I had to convert to integer

// cout << "The remainder of " << var1 << " and " << var2 << " is " << int(var1)%int(var2);

else cout << "Please enter valid operation such as '+' or '-' ";

return 0;

}

Text

Description automatically generated

Question 4

#include <iostream>

using namespace std;

int main()

{ //Variables

int progsramsDone, result;

//Initialising variables

cout << "Please enter number of programs done and mark obtained? "<< endl;

cin >> progsramsDone;

cin >> result;

//Start of while loop

while (progsramsDone<5 || result<50)

{

cout << "Please enter number of programs done and mark obtained? ";

cin >> progsramsDone;

cin >> result;

}

//Statement when loop is false

cout << "Good! You can now proceed to the next exercise"<< endl;

return 0;

}

Text

Description automatically generated

Question 5

#include <iostream>

using namespace std;

int main()

{ //Variables

int i, n;

//Variable initialisation

i=1;

n=10;

//While loop

while (i<=n)

{

cout << i \* i;

i++;

}

return 0;

}

Text

Description automatically generated

Question 6

First Version(Switch)

#include <iostream>

using namespace std;

int main()

{ //Variables

float amount, discount, finalAmount;

char customerType;

//Getting input from user

cout << "Please enter total amount due: R";

cin >> amount;

cout << "Please enter what type of customer are you? : " << endl;

cout << "Type S for Student" << endl;

cout << "Type D for Bookdealer" << endl;

cout << "Type P for Pensioner" << endl;

cout << "Type O for Other" << endl << endl;

cin>>customerType;

//Start of switch statement

switch(customerType)

{case 'S':

case 's':

discount = amount \* 0.1;

finalAmount = amount - discount;

break;

case 'D':

case 'd':

discount = amount \* 0.12;

finalAmount = amount - discount;

break;

case 'P':

case 'p':

discount = amount \* 0.15;

finalAmount = amount - discount;

break;

case 'O':

case 'o':

if (amount>200)

{ discount = amount \* 0.1;

finalAmount = amount - discount;

}

else finalAmount = amount;

break;

}

//Set decimal points to 2 places

cout.setf(ios::fixed);

cout.precision(2);

//Display output

cout << endl;

cout << "The final amount due after discount is: R" << finalAmount;

return 0;

}

Text

Description automatically generated

Version 2(Nested if statements)

#include <iostream>

using namespace std;

int main()

{ //Variables

float amount, discount, finalAmount;

char customerType;

//Getting input from user

cout << "Please enter total amount due: R";

cin >> amount;

cout << "Please enter what type of customer are you? : " << endl;

cout << "Type S for Student" << endl;

cout << "Type D for Bookdealer" << endl;

cout << "Type P for Pensioner" << endl;

cout << "Type O for Other" << endl << endl;

cin>>customerType;

//Start of Nested if statements

if (customerType == 'S' || customerType == 's' )

{

discount = amount \* 0.1;

finalAmount = amount - discount;

}

else if (customerType == 'D' || customerType == 'd')

{

discount = amount \* 0.12;

finalAmount = amount - discount;

}

else if (customerType == 'P' || customerType == 'p')

{

discount = amount \* 0.15;

finalAmount = amount - discount;

}

else if (customerType == 'O' || customerType == 'o')

{

if(amount > 200)

{

discount = amount \* 0.1;

finalAmount = amount - discount;

}

else finalAmount=amount;

}

//Set decimal points to 2 places

cout.setf(ios::fixed);

cout.precision(2);

//Display output

cout << endl;

cout << "The final amount due after discount is: R" << finalAmount;

return 0;

}

Text

Description automatically generated

Question 7

The logical error is that the x variable is declared as 1, which is an odd number therefore the loop which should stop when x is equal to 12 will never end and the output of the code will be a never ending loop.

#include <iostream>

using namespace std;

int main()

{ //Variables

int x = 2;

while (x!= 12)

{

cout << x << endl;

x = x + 2;

}

return 0;

}

Text

Description automatically generated

Question 8

While loop method

// Your code

totalCalories = 0;

count = 0;

while (count != numberOfItems)

{

cin >> caloriesForItem;

totalCalories = totalCalories + caloriesForItem ;

count++;

}

Text

Description automatically generated

For loop method

// Your code

totalCalories = 0;

for (count = 0; count != numberOfItems; count++)

{

cin >> caloriesForItem;

totalCalories = totalCalories + caloriesForItem ;

}

Text

Description automatically generated

Question 9

#include <iostream>

using namespace std;

int main()

{ //Variables

int votesForA = 0, votesForB = 0, votesForC = 0, spoiltVotes = 0;

int i;

char voteOption;

//Start of for loop

for(i = 1; i<5; i++ )

{

cout << "Please enter votes for voting station " << i << endl;

//Start of while loop to get input

while(voteOption != 'X' && voteOption != 'x')

{

cout << "Please enter which candidate you want to vote for using 'A', 'B' or 'C', 'X' terminates voting: " << endl;

cin >> voteOption;

cout << endl;

//Start of switch statement to assign votes gotten from input to variables

switch(voteOption)

{

case 'A':

case 'a': votesForA++;

break;

case 'B':

case 'b': votesForB++;

break;

case'C':

case'c': votesForC++;

break;

default: if (voteOption != 'X' && voteOption != 'x')

spoiltVotes++;

break;

}

}

//voteOption is assigned to 'Z' so when user chooses 'X' it doesnt skip the rest of the voting stations it reinitializes the voteOption variable

voteOption='Z';

}

//Displaying output

cout << "Total number of votes for candidate A = " << votesForA << endl;

cout << "Total number of votes for candidate B = " << votesForB << endl;

cout << "Total number of votes for candidate C = " << votesForC << endl;

cout << "Total spoilt votes = " << spoiltVotes << endl;

return 0;

}

Text

Description automatically generated

Question 10

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | year | code | book | Discount |
| Line 6 | ? | ? | ? | ? |
| Line 7 | ? | ? | true | 0.20 |
| Line 8 | 2010 | t | true | 0.20 |
| Line 20 | 2010 | t | false | 0.20 |
| Line 21 | 2010 | g | false | 0.20 |