

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, lemons=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, lemons=lemons*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<< lemons << " 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;
```

```
}
```

```
C:\Users\Jaymeen\Desktop\UnisaComputerScience\COS1511\Assignment1\assignment1.exe
Please enter the factor to multiply the ingredients with : 4
Recipe for Lemon Muffins
Ingredients:
8 cups of all-purpose flour
12 teaspoons of baking powder
4 tablespoons of grated lemon zest
4 eggs
2 cups of sugar
2 teaspoons of salt
3 cups of milk
1 cups of vegetable oil

Method:
1. Heat oven to 400 degrees F (205 degrees C). Grease bottoms only of 12 muffin cups or line with baking cups.
2. In a medium bowl, combine flour, sugar, baking powder, lemon zest and salt; mix well.
3. In a small bowl, combine milk, oil and egg and blend well
4. Add dry ingredients all at once; stir just until dry ingredients are moistened (batter will be lumpy.)
5. Fill cups 2/3 full, bake for 20 to 25 minutes or until toothpick inserted in center comes out clean.
6. Cool 1 minute before removing from pan and serve warm.

Process returned 0 (0x0)   execution time : 2.627 s
Press any key to continue.
```

## 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;

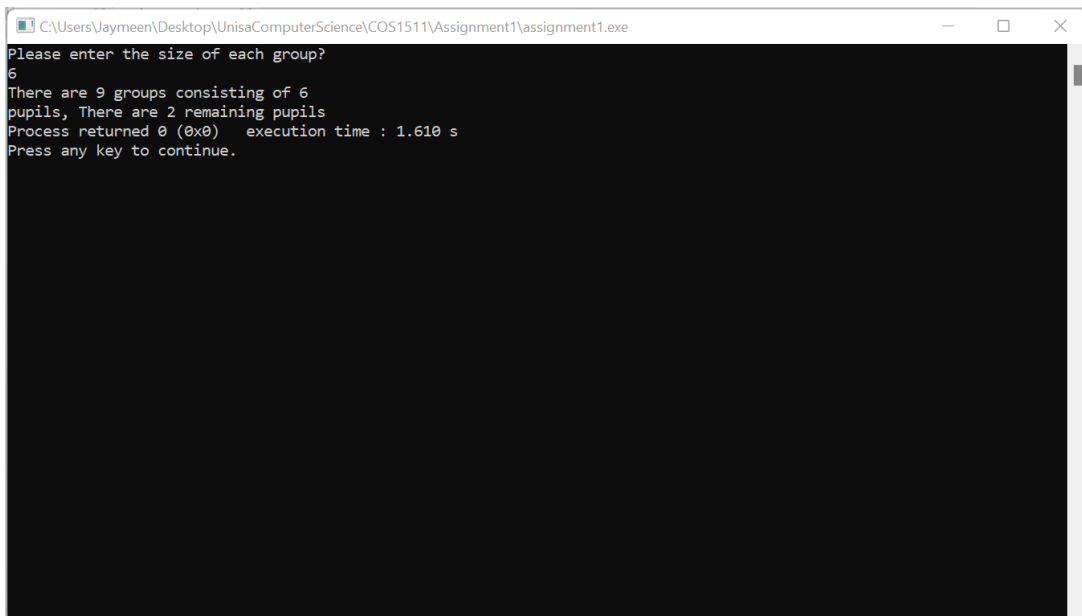
//Display output

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

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

return 0;

}
```



```
C:\Users\Jaymeen\Desktop\UnisaComputerScience\COS1511\Assignment1\assignment1.exe
Please enter the size of each group?
6
There are 9 groups consisting of 6
pupils, There are 2 remaining pupils
Process returned 0 (0x0)   execution time : 1.610 s
Press any key to continue.
```

### 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;
}

```

```

C:\Users\Jaymeen\Desktop\UnisaComputerScience\COS1511\Assignment1\assignment1.exe
Please enter the first float value: 56
Please enter the second value: 6
Please enter the operation required : /
The quotient of 56.00 and 6.00 is 9.33
Process returned 0 (0x0)   execution time : 9.857 s
Press any key to continue.

```

#### Question 4

```

#include <iostream>

using namespace std;

int main()

```

```
{ //Variables

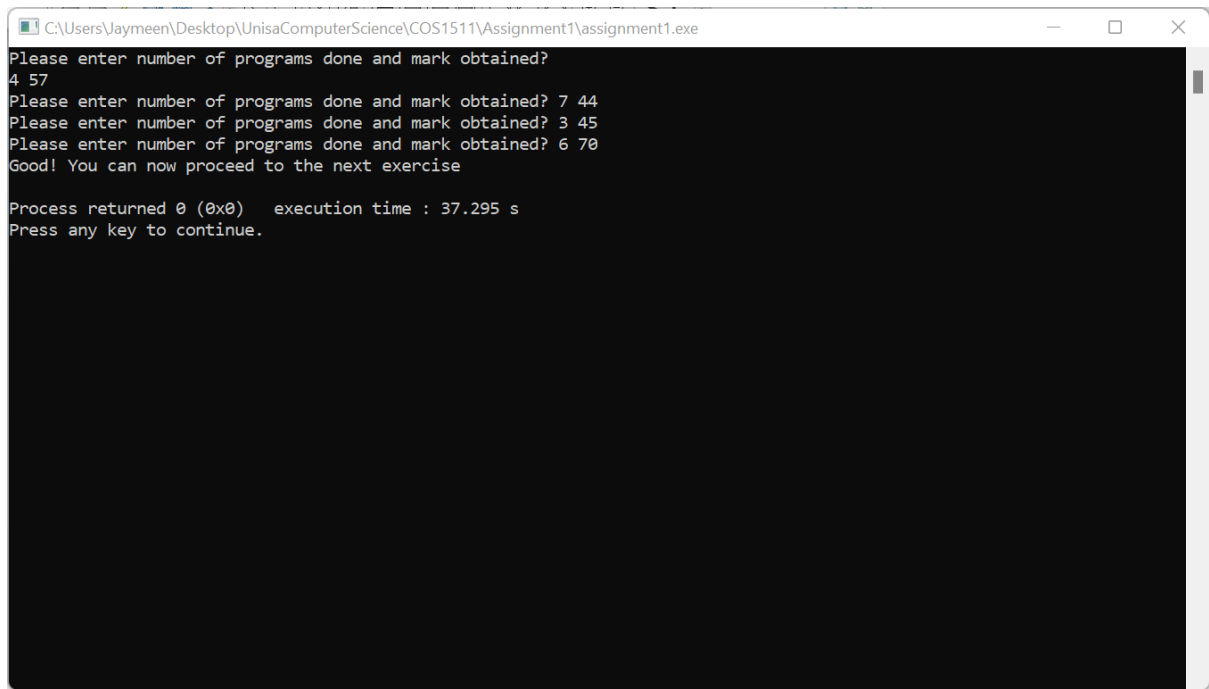
    int programsDone, result;


    //Initialising variables

    cout << "Please enter number of programs done and mark obtained? "<< endl;
    cin >> programsDone;
    cin >> result;


    //Start of while loop
    while (programsDone<5 || result<50)
    {
        cout << "Please enter number of programs done and mark obtained? ";
        cin >> programsDone;
        cin >> result;
    }
    //Statement when loop is false
    cout << "Good! You can now proceed to the next exercise"<< endl;


    return 0;
}
```



```
C:\Users\Jaymeen\Desktop\UnisaComputerScience\COS1511\Assignment1\assignment1.exe
Please enter number of programs done and mark obtained?
4 57
Please enter number of programs done and mark obtained? 7 44
Please enter number of programs done and mark obtained? 3 45
Please enter number of programs done and mark obtained? 6 70
Good! You can now proceed to the next exercise

Process returned 0 (0x0)   execution time : 37.295 s
Press any key to continue.
```

### 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;
```

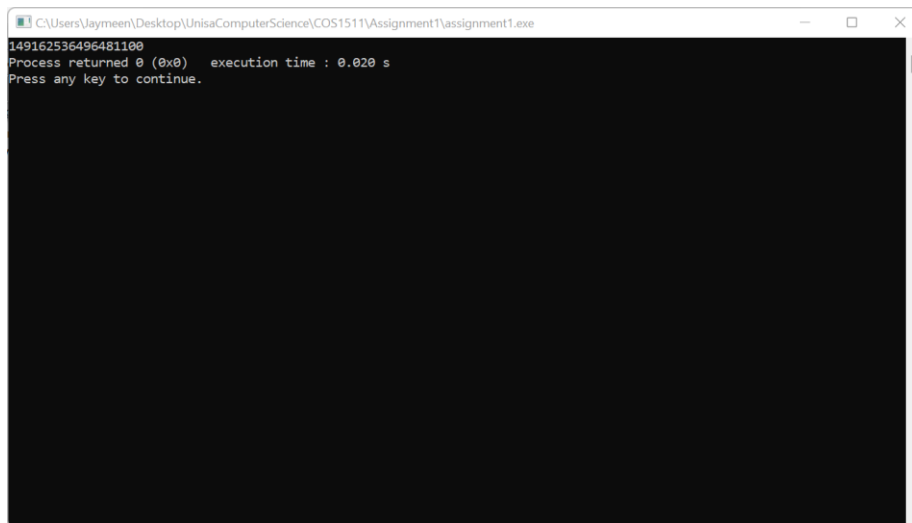


```

        i++;
    }

    return 0;
}

```



## 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;
}

```

```

C:\Users\Jaymeen\Desktop\UnisaComputerScience\COS1511\Assignment1\assignment1.exe
Please enter total amount due: R150
Please enter what type of customer are you? :
Type S for Student
Type D for Bookdealer
Type P for Pensioner
Type O for Other
P
The final amount due after discount is: R127.50
Process returned 0 (0x0)   execution time : 5.695 s
Press any key to continue.

```

### 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;
}
```

```
C:\Users\Jaymeen\Desktop\UnisaComputerScience\COS1511\Assignment1\assignment1.exe
Please enter total amount due: R500
Please enter what type of customer are you? :
Type S for Student
Type D for Bookdealer
Type P for Pensioner
Type O for Other
0
The final amount due after discount is: R450.00
Process returned 0 (0x0)   execution time : 24.916 s
Press any key to continue.
```

### 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)
```

```
{
```

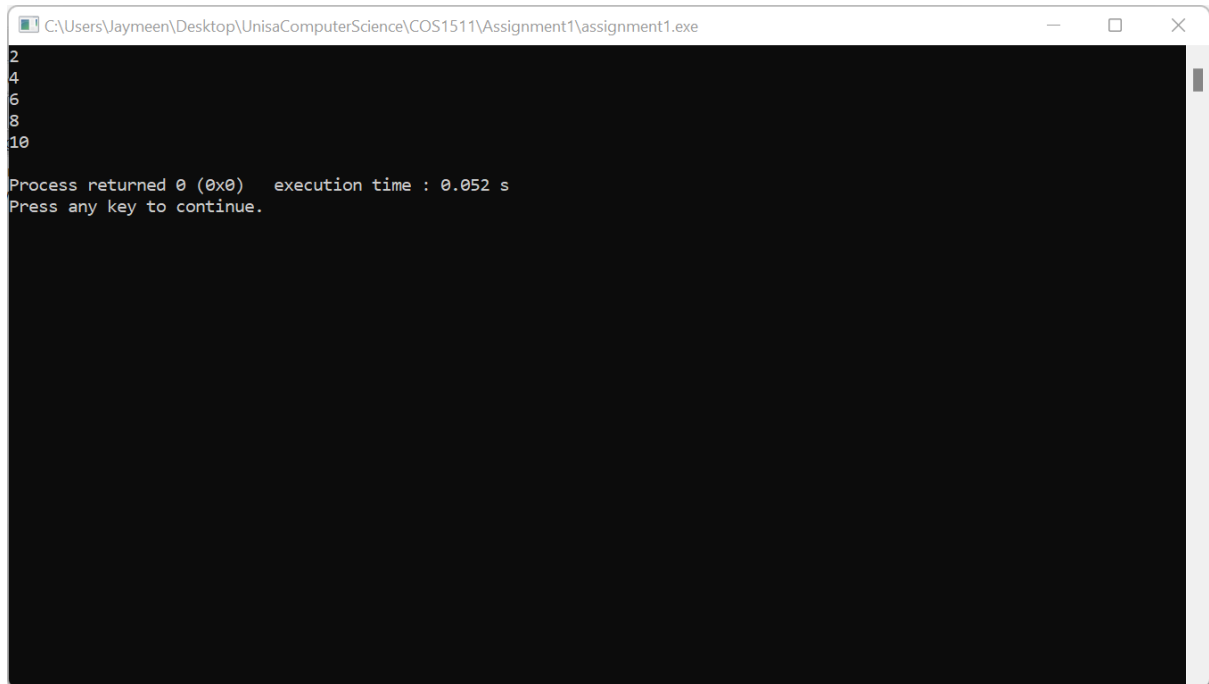
```
    cout << x << endl;
```

```
    x = x + 2;
```

```
}
```

```
return 0;
```

```
}
```



```
C:\Users\Jaymeen\Desktop\UnisaComputerScience\COS1511\Assignment1\assignment1.exe
2
4
6
8
10
Process returned 0 (0x0) execution time : 0.052 s
Press any key to continue.
```

## Question 8

### While loop method

```
// Your code
```

```
totalCalories = 0;
```

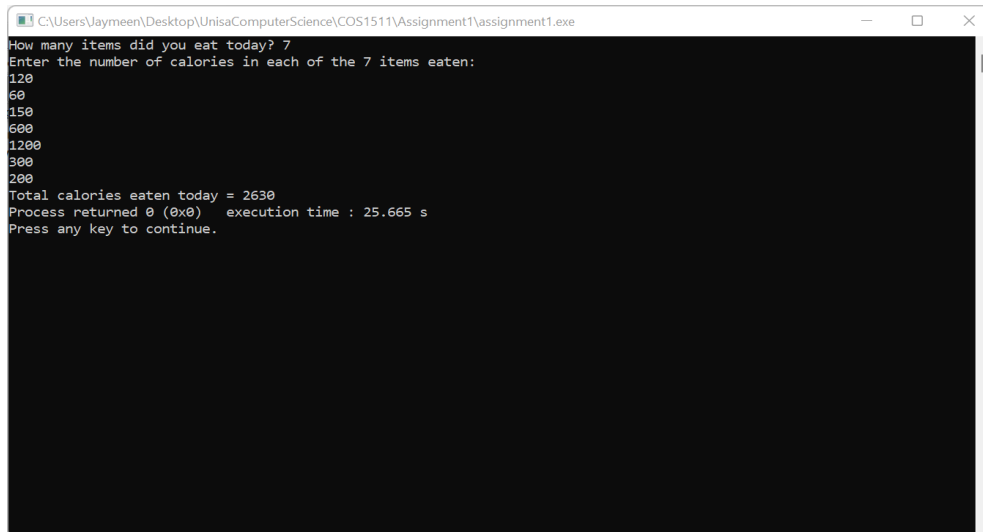
```
count = 0;
```

```
while (count != numberOfItems)
```

```
{
```

```
    cin >> caloriesForItem;
```

```
totalCalories = totalCalories + caloriesForItem ;  
  
count++;  
  
}
```



```
C:\Users\Jaymeen\Desktop\UnisaComputerScience\COS1511\Assignment1\assignment1.exe  
How many items did you eat today? 7  
Enter the number of calories in each of the 7 items eaten:  
120  
60  
150  
600  
1200  
300  
200  
Total calories eaten today = 2630  
Process returned 0 (0x0) execution time : 25.665 s  
Press any key to continue.
```

### For loop method

// Your code

```
totalCalories = 0;  
  
for (count = 0; count != numberOfItems; count++)  
{  
    cin >> caloriesForItem;  
    totalCalories = totalCalories + caloriesForItem ;  
}
```



```
C:\Users\Jaymeen\Desktop\UnisaComputerScience\COS1511\Assignment1\assignment1.exe
How many items did you eat today? 7
Enter the number of calories in each of the 7 items eaten:
120
60
150
600
1200
300
200
Total calories eaten today = 2630
Process returned 0 (0x0)   execution time : 25.665 s
Press any key to continue.
```

### 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;
}

```

```

C
Please enter which candidate you want to vote for using 'A', 'B' or 'C', 'X' terminates voting:
C
Please enter which candidate you want to vote for using 'A', 'B' or 'C', 'X' terminates voting:
B
Please enter which candidate you want to vote for using 'A', 'B' or 'C', 'X' terminates voting:
X
Please enter votes for voting station 4
Please enter which candidate you want to vote for using 'A', 'B' or 'C', 'X' terminates voting:
A
Please enter which candidate you want to vote for using 'A', 'B' or 'C', 'X' terminates voting:
B
Please enter which candidate you want to vote for using 'A', 'B' or 'C', 'X' terminates voting:
X
Total number of votes for candidate A = 4
Total number of votes for candidate B = 8
Total number of votes for candidate C = 4
Total spoilt votes = 2

Process returned 0 (0x0)   execution time : 42.070 s
Press any key to continue.

```

### 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