

C++

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PROJECTS

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Project 1.0: Character, integer

```
//Turgut Tezir
// project 1
#include<stdlib.h>
#include<iostream.h>
#include<time.h>
void main (void)
    {
        char loop,ch;
        srand (unsigned (time (0)));
        do // outer loop
            {
                cout<<"\n Character: "<<"\t"<<"Integer\n";
                do //inner loop
                    {
                        ch=char (65 + rand () %57);
//while (char (65 +rand () %57) <'a' && > 'Z'){
                    }
                    while(ch < 'a' && ch > 'Z');// inner while
                //ch=char (65 + rand () %57);
                cout<< "\n\t" << ch << "\t"<< int (ch);
                cout<< "\n do again (y/n) ";
                cin>>loop;
            }
            while (loop=='y' ||loop== 'Y'); // outer while
        }
// inner loop picks a random char. and checks if it is between 'a' to 'Z'
// if it is, it prints otherwise go back picks another Rand. char.
```

Project 2.1: Main Calculation (midterm)

```
//Turgut Tezir
//PROJ MIDTERM 1 Main Calculation
#include<iostream.h>
#include<ctype.h>
void Add(int n1, int d1, int n2, int d2, int &n, int &d);
void Sub(int n1, int d1, int n2, int d2, int &n, int &d);
void Mult(int n1, int d1, int n2, int d2, int &n, int &d);
void Div(int n1, int d1, int n2, int d2, int &n, int &d);
void Reduce(int &n, int &d);
void Compute(char &op, int n1, int d1, int n2, int d2, int &n, int &d);
void main(void)
    {
        int num1=0,dem1=0,num2=0,dem2=0,num=0,dem=0;
        char loop='n', dummy='/', op;
        do
            {
```

```

cout<<"\n Enter operation: (ex: 1/2+2/3): ";
cin>>num1>>dummy>>dem1>>op>>num2>>dummy>>dem2;
Compute(op,num1,dem1,num2,dem2,num,dem);
Reduce(num,dem);
if(op=='+')
cout<<"\n"<<" Addition :";
else if(op=='-')
cout<<"\n"<<" Subtraction :";
else if(op=='*')
cout<<"\n"<<" Multiplication :";
else if(op=='/')
cout<<"\n"<<" Division :";
if(dem==1)
cout<<num;
else if(num==dem)
    cout<<" 1 ";
else cout<<num<<dummy<<dem;
    cout<<"\n Do another: (y/n)";
    cin>>loop;
}
while(tolower(loop)=='y');
    cout<<"\n Bye! Have a Nice Day";
}
void Add(int n1, int d1, int n2, int d2, int &n, int &d)
{
    d=(d1*d2);
    n= (d/d1*n1) + ( d/d2*n2);
}
void Sub(int n1, int d1, int n2, int d2, int &n, int &d)
{
    n=(n1*d2)-(d2*n2);
    d=(d1*d2);
}
void Mult(int n1, int d1, int n2, int d2, int &n, int &d)
{
    n=(n1*n2);
    d=(d1*d2);
}
void Div(int n1, int d1, int n2, int d2, int &n, int &d)
{
    n=(n1*d2);
    d=(d1*n2);
}
void Reduce(int &n, int &d)
{
    int i=2;

```

```

        for(; i<n||i<d;i++)
            while( (n%i==0) && (d%i==0) )
                {
                    n/=i;
                    d/=i;
                }
    }
void Compute(char &op, int n1, int d1, int n2, int d2, int &n, int &d)
    {
        switch(op)
            {
                case'+':Add(n1,d1,n2,d2,n,d);
                break;
                case'-':Sub(n1,d1,n2,d2,n,d);
                break;
                case'*':Mult(n1,d1,n2,d2,n,d);
                break;
                case'/':Div(n1,d1,n2,d2,n,d);
                break;
                Default:cout<< "\n Invalid Operation!";
            }
    }
}

```

Project 2.2: Main Calculation with Class-1 (midterm)

```

//Turgut Tezir
//Proj. 4...CLASS
#include<iostream.h>
#include<ctype.h>
class cls1
{
public:
    Add(int n1, int d1, int n2, int d2, int &n, int &d);
    Sub(int n1, int d1, int n2, int d2, int &n, int &d);
    Mult(int n1, int d1, int n2, int d2, int &n, int &d);
    Div(int n1, int d1, int n2, int d2, int &n, int &d);
    Reduce(int &n, int &d);
    Compute(char &op, int n1, int d1, int n2, int d2, int &n, int &d);
private:
    int d,n;
};
cls1::Add(int n1, int d1, int n2, int d2, int &n, int &d)
    {
        d=(d1*d2);
        n= (d/d1*n1) + ( d/d2*n2);
    }
cls1::Sub(int n1, int d1, int n2, int d2, int &n, int &d)

```

```

        {
            d=(d1*d2);
            n= (d/d1*n1) - ( d/d2*n2);
        }
cls1::Mult(int n1, int d1, int n2, int d2, int &n, int &d)
    {
        n=(n1*n2);
        d=(d1*d2);
    }
cls1::Div(int n1, int d1, int n2, int d2, int &n, int &d)
    {
        n=(n1*d2);
        d=(d1*n2);
    }
cls1::Reduce(int &n, int &d)
{
    int i=2;
    for(; i<n||i<d;i++)
        while( (n%i==0) && (d%i==0) )
            {
                n/=i;
                d/=i;
            }
}

void Compute(char &op, int n1, int d1, int n2, int d2, int &n, int &d);
cls1 cl;
void main(void)
{
    int num1=0,dem1=0,num2=0,dem2=0,num=0,dem=0;
    char loop='n', dummy='/', op;
    do
        {
            cout<<"\n Enter operation: (ex: 1/2+2/3): ";
            cin>>num1>>dummy>>dem1>>op>>num2>>dummy>>dem2;
            Compute(op,num1,dem1,num2,dem2,num,dem);
            cl.Reduce(num,dem);
            if(op=='+')
                cout<<"\n"<<" Addition :";
            else if(op=='-')
                cout<<"\n"<<" Subtraction :";
            else if(op=='*')
                cout<<"\n"<<" Multiplication :";
            else if(op=='/')
                cout<<"\n"<<" Division :";
            if(dem==1)

```

```

        cout<<num;
    else if(num==dem)
        cout<< " 1 ";
    else cout<<num<<dummy<<dem;
        cout<<"\n Do another: (y/n)";
        cin>>loop;
    }
    while(tolower(loop)=='y');
        cout<<"\n Bye! Have a Nice Day";
}
void Compute(char &op, int n1, int d1, int n2, int d2, int &n, int &d)
{
    switch(op)
    {
        case'+':cl.Add(n1,d1,n2,d2,n,d);
        break;
        case'-':cl.Sub(n1,d1,n2,d2,n,d);
        break;
        case'*':cl.Mult(n1,d1,n2,d2,n,d);
        break;
        case'/':cl.Div(n1,d1,n2,d2,n,d);
        break;
        default:cout<< "\n Invalid Operation!";
    }
}

```

Project 2.3: Main Calculation with different files in class (midterm)

```

//Turgut Tezir
//PROJECT 2-3: Main Calculation with different file in class
#ifndef CLS1_H
#define CLS1_H
class cls1
{
public:
    Add(int n1, int d1, int n2, int d2, int &n, int &d);
    Sub(int n1, int d1, int n2, int d2, int &n, int &d);
    Mult(int n1, int d1, int n2, int d2, int &n, int &d);
    Div(int n1, int d1, int n2, int d2, int &n, int &d);
    Reduce(int &n, int &d);
    Compute(char &op, int n1, int d1, int n2, int d2, int &n, int &d);
private:
    int d,n;
};
#endif
#include<iostream.h>
#include<ctype.h>

```

```

#include "cls1.h"
void Compute(char &op, int n1, int d1, int n2, int d2, int &n, int &d);
cls1 cl;
void main(void)
{
    int num1=0,dem1=0,num2=0,dem2=0,num=0,dem=0;
    char loop='n', dummy='/', op;
    do
    {
        cout<<"\n Enter operation: (ex: 1/2+2/3): ";
        cin>>num1>>dummy>>dem1>>op>>num2>>dummy>>dem2;
        Compute(op,num1,dem1,num2,dem2,num,dem);
        cl.Reduce(num,dem);
        if(op=='+')
            cout<<"\n"<<" Addition :";
        else if(op=='-')
            cout<<"\n"<<" Subtraction :";
        else if(op=='*')
            cout<<"\n"<<" Multiplication :";
        else if(op=='/')
            cout<<"\n"<<" Division :";
        if(dem==1)
            cout<<num;
        else if(num==dem)
            cout<<" 1 ";
        else cout<<num<<dummy<<dem;
        cout<<"\n Do another: (y/n)";
        cin>>loop;
    }
    while(tolower(loop)=='y');
    cout<<"\n Bye! Have a Nice Day";
}
void Compute(char &op, int n1, int d1, int n2, int d2, int &n, int &d)
{
    switch(op)
    {
        case'+':cl.Add(n1,d1,n2,d2,n,d);
        break;
        case'-':cl.Sub(n1,d1,n2,d2,n,d);
        break;
        case'*':cl.Mult(n1,d1,n2,d2,n,d);
        break;
        case'/':cl.Div(n1,d1,n2,d2,n,d);
        break;
        default:cout<<"\n Invalid Operation!";
    }
}

```

```

}

// cls1.cpp: implementation of the cls1 class.
#include "cls1.h"
// Construction/Destruction
#include <iostream>
#include "cls1.h"
cls1::Add(int n1, int d1, int n2, int d2, int &n, int &d)
    {
        d=(d1*d2);
        n= (d/d1*n1) + ( d/d2*n2);
    }
cls1::Sub(int n1, int d1, int n2, int d2, int &n, int &d)
    {
        d=(d1*d2);
        n= (d/d1*n1) - ( d/d2*n2);
    }
cls1::Mult(int n1, int d1, int n2, int d2, int &n, int &d)
    {
        n=(n1*n2);
        d=(d1*d2);
    }
cls1::Div(int n1, int d1, int n2, int d2, int &n, int &d)
    {
        n=(n1*d2);
        d=(d1*n2);
    }
cls1::Reduce(int &n, int &d)
{
    int i=2;
    for(; i<n||i<d;i++)
        while( (n%i==0) && (d%i==0) )
            {
                n/=i;
                d/=i;
            }
}

```

Project 3.0 Sort the array (20)

```

//Write a program that takes various integer inputs from the keyboard into
//integer array ar[] with a size of 20, sorts & outputs them to the screen.
#include <fstream.h>
#include <iomanip.h>
void main()
{
    int temp, i, j, number1;

```

```

const int arraysize = 20;
int mynumbers[arraysize];
for (i=0; i<arraysize; i++)
{
    cout<<"Give number: "<<i<<" ";
    cin>>number1;
mynumbers[i] =number1;
    cout<<endl;
}
cout<<"Original array"<<endl;
for (i=0; i<arraysize; i++)
    cout<<mynumbers[i]<<" ";

for (i=0;i<arraysize-1;i++)
{
    for(j= i+1 ; j<arraysize; j++)
    {
        if (mynumbers[i] > mynumbers[j])
            {
                temp=mynumbers[i];
                mynumbers[i]=mynumbers[j];
                mynumbers[j]=temp;
            }
    }
}
cout<<endl<<endl<<"Sorted array"<<endl;
for (i=0;i<arraysize;i++)
{
    cout<<mynumbers[i]<<" ";
    cout<<endl;
}
}

```

Project 4.0 Rectangle

```

//Turgut Tezir
//Project REctangle
#include<iostream.h>
class Point
{
    int x,y; //private by defuault
public:
    Point(){}
    Point(int ix, int iy):x(ix),y(iy){ } //set the value of x to ix
    int Getx(){return x;}
    int Gety(){return y;}
}

```

```

    void Draw(void);
    void Setp(int xa,int ya){x=xa;y=ya;}
};

class Rectangle:public Point
{
    public:
    Point p1,p2;
    Rectangle (int x1, int y1, int xz,int yz):p1(x1,y1),p2(xz,yz){;}
    void SetR(int xa,int ya,int xb,int yb)
        {
            p1.Setp(xa,ya);
            p2.Setp(xb,yb);
        }

    void Draw();
};

void Rectangle::Draw()
{
    p1.Draw();
    p2.Draw();
}

void Point::Draw(void)
{
    for(int cy =0; cy < y ; cy++) //for y
        cout<<"\n";
    for(int cx =0; cx < x ; cx++)
        cout<<"\t";
    cout<<"X";
}

void main(void)
{
    Point p1(5,20);
    p1.Draw();
    Rectangle r(0,1,5,10);
    r.Draw();
}

```

Project 5.0: Last Project Formula

//Turgut Tezir

//Last Project compute the values of formula that express y in terms of x((FORMULA))

#include<iostream.h>

#include<math.h>

void main()

```

{
    double r1,r2,y;

```

```

for(double x=-3; x<=4; x += 0.5){
    r1 = 9 * pow(x,3) - 27 * pow(x,2) - 4 * x + 12;
    r2 = sqrt(3 * pow(x,2) + 1) + fabs(5 - pow(x,4));
    if (r2==0)
        cout<<"You can not divide by ZERO"<< endl;
    else
        y = r1 / r2;

    cout << "X=" << x << "Y=" << y << endl;

    if (y==0)
        cout <<"Y is ZERO"<< endl;
    else if (y>0)
        cout <<"Y is POSITIVE"<< endl;
    else
        cout << "Y is NEGATIVE"<< endl;

}
}

```

Project 6.0: Final Project

//Turgut Tezir

//Project Final.

#include<iostream.h>

#include<iostream.h>

#include<fstream.h>

#include<time.h>

#include<stdlib.h>

void BubbleSort(int a[], const int SIZE);

void InsertSort(int c[], const int SIZE);

void main()

{

 srand(unsigned(time(0)));

 const int SIZE=1000;

 int num,Arnum[SIZE];

 ofstream newfile,last;

 newfile.open ("a:\\wordi.txt");

 last.open("a:\\results.txt");

 for (int i=0;i<1000;i++)

 { if(i%10==0)

 newfile << endl;

 num = 7+rand()%21993;

 newfile << num << '\t';

 }

```

newfile.close();
ofstream savfile;
savfile.open("a:\\wordo.txt");
ifstream infile;
infile.open("a:\\wordi.txt");
    last<<"results"
    <<"\n\n";
    cout<<"results"
    <<"\n\n";
    last<<"Bubble Sort Now.\n\n";
    cout<<"Bubble Sort Now.\n\n";
    i=0;

    while(infile >> num)
        {
            Arnum[i]= num;
            if(i%10 == 0)
                {
                    cout << Arnum[i] << '\t';
                    last << Arnum[i] << '\t';
                }
            i++;
        }
    clock_t start, finish;
    float duration;

    cout << "\n\n\nMeasuring BubbleSort Now.\n\n\n ";
    start = clock();

    BubbleSort(Arnum,SIZE);
    finish = clock();
    duration = (float)(finish - start) / CLOCKS_PER_SEC;
    last << "\n\n Measuring BubbleSort was:\n\n";
    cout << "seconds:" << duration << "\n\n";
    last << "seconds:" << duration << "\n\n"; //saving in results.txt

    for(i = 0; i < SIZE; i+=10)
        {
            cout << Arnum[i] << '\t';
            last << Arnum[i] << '\t';
        }
    cout<<"\n\n\n";
    last<<"\n\n\n";

infile.close();
infile.open("a:\\wordi.txt");

```



```
        a[j+1] = hold;
    }
}
```

```
void InsertSort(int c[], const int SIZE)
```

```
{
    int position, insert;
    for(int i = 1; i < SIZE; i++)
    {
        insert = c[i];
        for (position = i - 1; position >= 0 && insert < c[position];
position--)
            c[position + 1] = c[position];
        c[position + 1] = insert;
    }
}
```