

Assignment Title:	Write C++ program to implement Cohen Southerland line clipping algorithm
Assignment No.:	2
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Program Code:

```
/*Write C++ program to implement Cohen Southerland line clipping algorithm.*/
```

```
#include<iostream>
#include<graphics.h>
#include<math.h>
#include<cstdlib>
```

```
using namespace std;
typedef struct coordinate
{
    int x,y;
    char code[4];
}PT;
void drawwindow();
void drawline(PT p1,PT p2);
PT setcode(PT p);
int visibility(PT p1,PT p2);
PT resetendpt(PT p1,PT p2);
int main()
{
```

```

int gd=DETECT,v,gm;
PT p1,p2,p3,p4,ptemp;
cout<<"\nEnter (x1,y1) & (x2,y2)\n";
cin>>p1.x>>p1.y>>p2.x>>p2.y;
initgraph(&gd,&gm,NULL);
drawwindow();
delay(500);
drawline(p1,p2);
delay(500);
cleardevice();
delay(500);
p1=setcode(p1);
p2=setcode(p2);
v=visibility(p1,p2);
delay(500);
switch(v)
{
case 0: drawwindow();
        delay(500);
        drawline(p1,p2);
        break;
case 1: drawwindow();
        delay(500);
        break;
case 2: p3=resetendpt(p1,p2);
        p4=resetendpt(p2,p1);
        drawwindow();
        delay(500);
        drawline(p3,p4);
        break;
}
delay(5000);

```

```

    closegraph();
    return 0;
}
void drawwindow()
{
    line(150,100,450,100);
    line(450,100,450,350);
    line(450,350,150,350);
    line(150,350,150,100);
}
void drawline(PT p1,PT p2)
{
    line(p1.x,p1.y,p2.x,p2.y);
}
PT setcode(PT p)    //for setting the 4 bit code
{
    PT ptemp;

    if(p.y<100)
        ptemp.code[0]='1';    //Top
    else
        ptemp.code[0]='0';

    if(p.y>350)
        ptemp.code[1]='1';    //Bottom
    else
        ptemp.code[1]='0';

    if(p.x>450)
        ptemp.code[2]='1';    //Right
    else
        ptemp.code[2]='0';

```

```

    if(p.x<150)
        ptemp.code[3]='1'; //Left
    else
        ptemp.code[3]='0';
    ptemp.x=p.x;
    ptemp.y=p.y;
    return(ptemp);
}
int visibility(PT p1,PT p2)
{
    int i,flag=0;
    for(i=0;i<4;i++)
    {
        if((p1.code[i]!='0') || (p2.code[i]!='0'))
            flag=1;
    }
    if(flag==0)
        return(0);

    for(i=0;i<4;i++)
    {
        if((p1.code[i]==p2.code[i]) && (p1.code[i]=='1'))
            flag='0';
    }
    if(flag==0)
        return(1);
    return(2);
}
PT resetendpt(PT p1,PT p2)
{
    PT temp;

```

```

int x,y,i;
float m,k;
if(p1.code[3]=='1')
    x=150;
if(p1.code[2]=='1')
    x=450;
if((p1.code[3]=='1') || (p1.code[2]=='1'))
{
    m=(float)(p2.y-p1.y)/(p2.x-p1.x);
    k=(p1.y+(m*(x-p1.x)));
    temp.y=k;
    temp.x=x;
    for(i=0;i<4;i++)
        temp.code[i]=p1.code[i];
    if(temp.y<=350 && temp.y>=100)
        return (temp);
}
if(p1.code[0]=='1')
    y=100;
if(p1.code[1]=='1')
    y=350;
if((p1.code[0]=='1') || (p1.code[1]=='1'))
{
    m=(float)(p2.y-p1.y)/(p2.x-p1.x);
    k=(float)p1.x+(float)(y-p1.y)/m;
    temp.x=k;
    temp.y=y;
    for(i=0;i<4;i++)
        temp.code[i]=p1.code[i];
    return(temp);
}
else

```

```
    return(p1);  
}
```

Program Output:

```
C:\Users\saran\OneDrive\Desktop\Submission\CG(test)\bin\Debug\test.exe  
Enter (x1,y1) & (x2,y2)  
100 100  
200 200
```



