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Sample Source Code :-

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

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

using namespace std;

class Coordinate
{
   public:
      int x, y;
      char code[4];
};

class Lineclip
{
   public:
      Coordinate PT;
      void drawwindow();
      void drawline(Coordinate p1, Coordinate p2);
      Coordinate setcode(Coordinate p);
      int visibility(Coordinate p1, Coordinate p2);
      Coordinate resetendpt(Coordinate p1, Coordinate p2);
};

int main()
{
   Lineclip lc;
   int gd = DETECT, v, gm;
   Coordinate p1, p2, p3, p4, temp;

   cout << "\n Enter x1 and y1\n";
   cin >> p1.x >> p1.y;
   cout << "\n Enter x2 and y2\n";
   cin >> p2.x >> p2.y;

   initgraph(&gd,&gm,"");
   lc.drawwindow();
   delay(2000);

   lc.drawline(p1,p2);
   delay(2000);
   cleardevice();

   delay(2000);
```

```
   p1 = lc.setcode(p1);
   p2 = lc.setcode(p2);
   v = lc.visibility(p1, p2);
   delay(2000);

   switch (v)

   {
   case 0:
      lc.drawwindow();
      delay(2000);
      lc.drawline(p1, p2);
      break;

   case 1:
      lc.drawwindow();
      delay(2000);
      break;

   case 2:
      p3 = lc.resetendpt(p1, p2);
      p4 = lc.resetendpt(p2, p1);
      lc.drawwindow();
      delay(2000);
      lc.drawline(p3, p4);
      break;
   }
   delay(2000);
   closegraph();
}

void Lineclip::drawwindow()
{
   line(150, 100, 450, 100);
   line(450, 100, 450, 350);
   line(450, 350, 150, 350);
   line(150, 350, 150, 100);
}

void Lineclip::drawline(Coordinate p1, Coordinate p2)
{
   line(p1.x, p1.y, p2.x, p2.y);
}

Coordinate Lineclip::setcode(Coordinate p)
{
   Coordinate ptemp;
   if(p.y<100)
      ptemp.code[0] = '1';
   else
      ptemp.code[0] = '0';
```

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

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

   if(p.x<150)
      ptemp.code[3] = '1';
   else
      ptemp.code[3] = '0';

   ptemp.x = p.x;
   ptemp.y = p.y;
   return(ptemp);
};

int Lineclip::visibility(Coordinate p1, Coordinate p2)
{
   int i, flag = 0;

   for (i=0; i<4; i++)
   {
      if (p1.code[i]!='0' || (p2.code[i] == '1'))
         flag = '0';
   }

   if (flag==0)
      return(0);

   for (i=0; i<4; i++)
   {
      if (p1.code[i] == p2.code[i] && (p2.code[i] == '1'))
         flag = '0';
   }

   if (flag==0)
      return(1);

   return(2);
}

Coordinate Lineclip::resetendpt(Coordinate p1, Coordinate p2)
{
   Coordinate 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[1]=='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);
}
```

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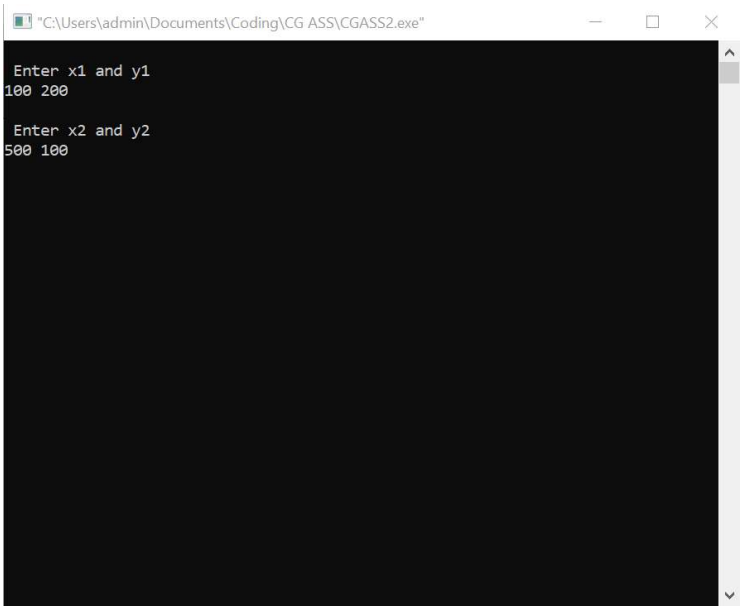
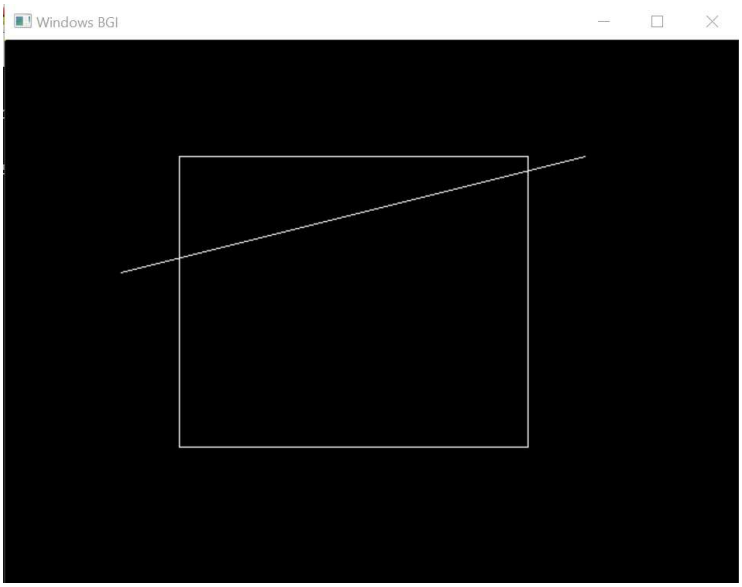
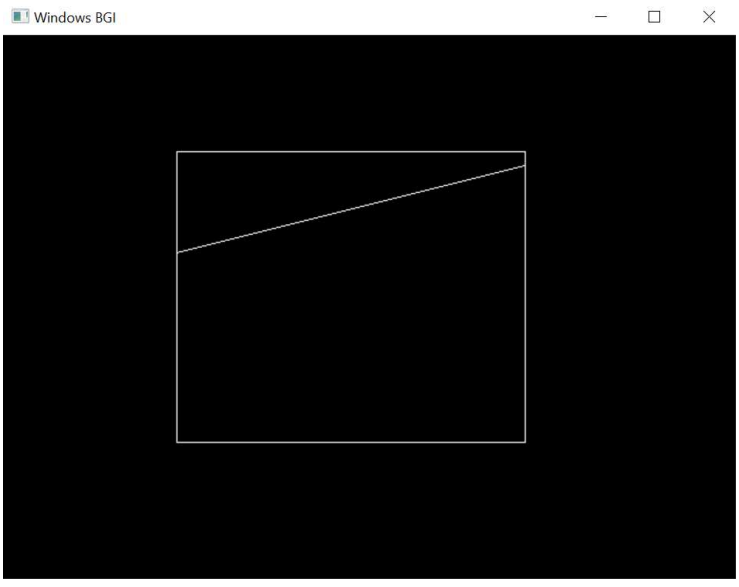
Sample Output :-


"C:\Users\admin\Documents\Coding\CG ASS\CGASS2.exe"
Enter x1 and y1
100 200
Enter x2 and y2
500 100


Windows BGI


Windows BGI