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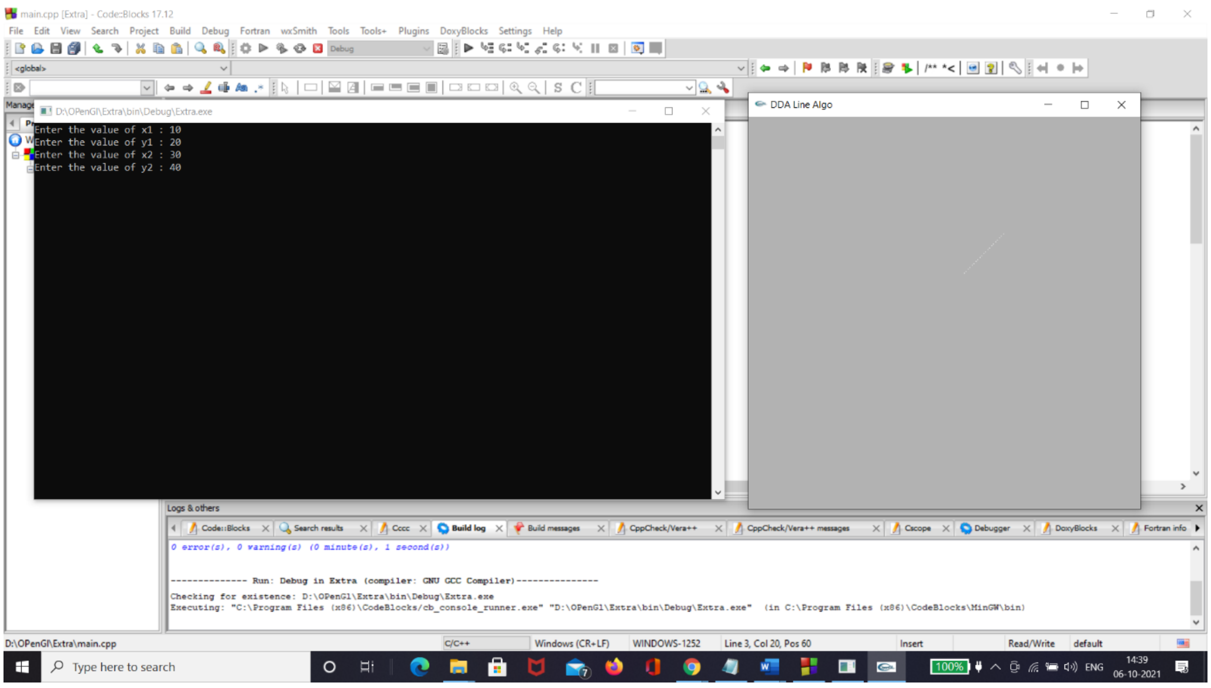
B-5 AI&ML SEM-5

Experiment-2

DDA Line Algorithm

```
#include<windows.h>
#include<GL/glu.h>
#include<GL/glut.h>
#include<stdlib.h>
#include<stdio.h>
float x1,x2,y1,y2;

void display(void)
{
float dy,dx,step,x,y,k,m;
dx=x2-x1;
dy=y2-y1;
m=dy/dx;

if(abs(dx)> abs(dy))
{
step = abs(dx);
}
else
step = abs(dy);

x=x1;
y=y1;
glBegin(GL_POINTS);
glVertex2i(x,y);
glEnd();

for (k=1 ;k<=step;k++)
{
   if(m<1){
      x= 1 + x;
      y= m + y;
   }
   if(m==1){
      x= 1 + x;
```

```
        y= 1 + y;
    }
    if(m>1){
        x= (1/m) + x;
        y= 1 + y;
    }
glBegin(GL_POINTS);
glVertex2i(x,y);
glEnd();
}

glFlush();
}

void init(void)
{
glClearColor(0.7,0.7,0.7,0.7);
glMatrixMode(GL_PROJECTION);
glLoadIdentity();
gluOrtho2D(-100,100,-100,100);
}

int main(int argc, char** argv) {
printf("Enter the value of x1 : ");
scanf("%f",&x1);
printf("Enter the value of y1 : ");
scanf("%f",&y1);
printf("Enter the value of x2 : ");
scanf("%f",&x2);
printf("Enter the value of y2 : ");
scanf("%f",&y2);

glutInit(&argc, argv);
glutInitDisplayMode (GLUT_SINGLE | GLUT_RGB);
glutInitWindowSize (500, 500);
glutInitWindowPosition (100,100);
glutCreateWindow ("DDA Line Algo");
init();
glutDisplayFunc(display);
glutMainLoop();

return 0;
}
```

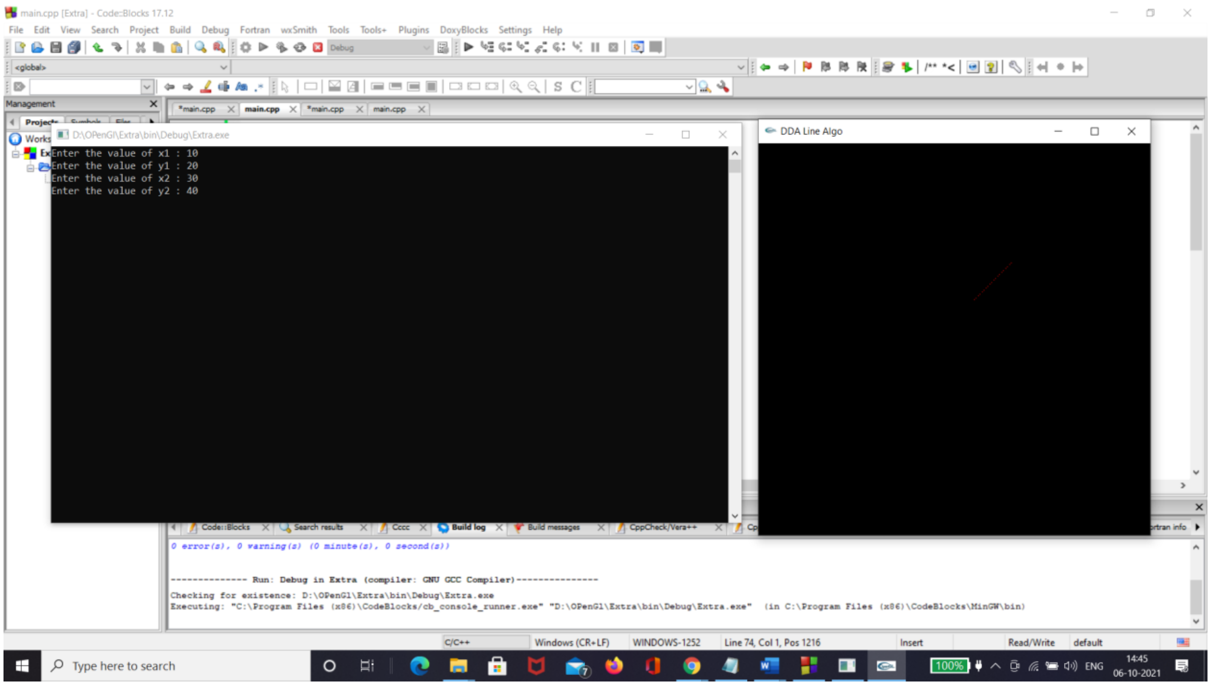


```
Enter the value of x1 : 10
Enter the value of y1 : 20
Enter the value of x2 : 30
Enter the value of y2 : 40
```

```
0 error(s), 0 warning(s) (0 minute(s), 1 second(s))


-------------- Run: Debug in Extra (compiler: GNU GCC Compiler)---------------
Checking for existence: D:\OPenGl\Extra\bin\Debug\Extra.exe
Executing: "C:\Program Files (x86)\CodeBlocks/cb_console_runner.exe" "D:\OPenGl\Extra\bin\Debug\Extra.exe"  (in C:\Program Files (x86)\CodeBlocks\MinGW\bin)
```

Bresenham Line Algorithm

```
#include<windows.h>
#include<GL/glu.h>
#include<GL/glut.h>
#include<stdlib.h>
#include<stdio.h>
float x1,x2,y1,y2;

void display(void)
{
float dy,dx,step,x,y,pk;
dx=x2-x1;
dy=y2-y1;

pk = 2*(dy) - dx ;

step = dx-1 ;

x=x1;
y=y1;
glBegin(GL_POINTS);
glVertex2i(x,y);
glEnd();

for (int k=1 ;k<=step;k++)
{
    if(pk<0){
        pk=pk + 2*(dy) ;
        x = x + 1;
        y = y;
    }
    if(pk>=0){
        pk=pk + 2*(dy) - 2*(dx) ;
        x= x + 1;
        y= y + 1;
    }

glBegin(GL_POINTS);
glVertex2i(x,y);
glEnd();
}

glFlush();
}

void init(void)
{
glColor3f(1.0,0.0,0.0);
glMatrixMode(GL_PROJECTION);
glLoadIdentity();
gluOrtho2D(-100,100,-100,100);
}

int main(int argc, char** argv) {
printf("Enter the value of x1 : ");
scanf("%f",&x1);
printf("Enter the value of y1 : ");
scanf("%f",&y1);
printf("Enter the value of x2 : ");
scanf("%f",&x2);
printf("Enter the value of y2 : ");
scanf("%f",&y2);

glutInit(&argc, argv);
glutInitDisplayMode (GLUT_SINGLE | GLUT_RGB);
glutInitWindowSize (500, 500);
glutInitWindowPosition (100,100);
glutCreateWindow ("Bresenham Line Algo");
init();
glutDisplayFunc(display);
glutMainLoop();

return 0;
}
```


main.cpp [Extra] - Code::Blocks 17.12
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
D:\OPenGl\Extra\bin\Debug\Extra.exe
DDA Line Algo

```
Enter the value of x1 : 10
Enter the value of y1 : 20
Enter the value of x2 : 30
Enter the value of y2 : 40
```

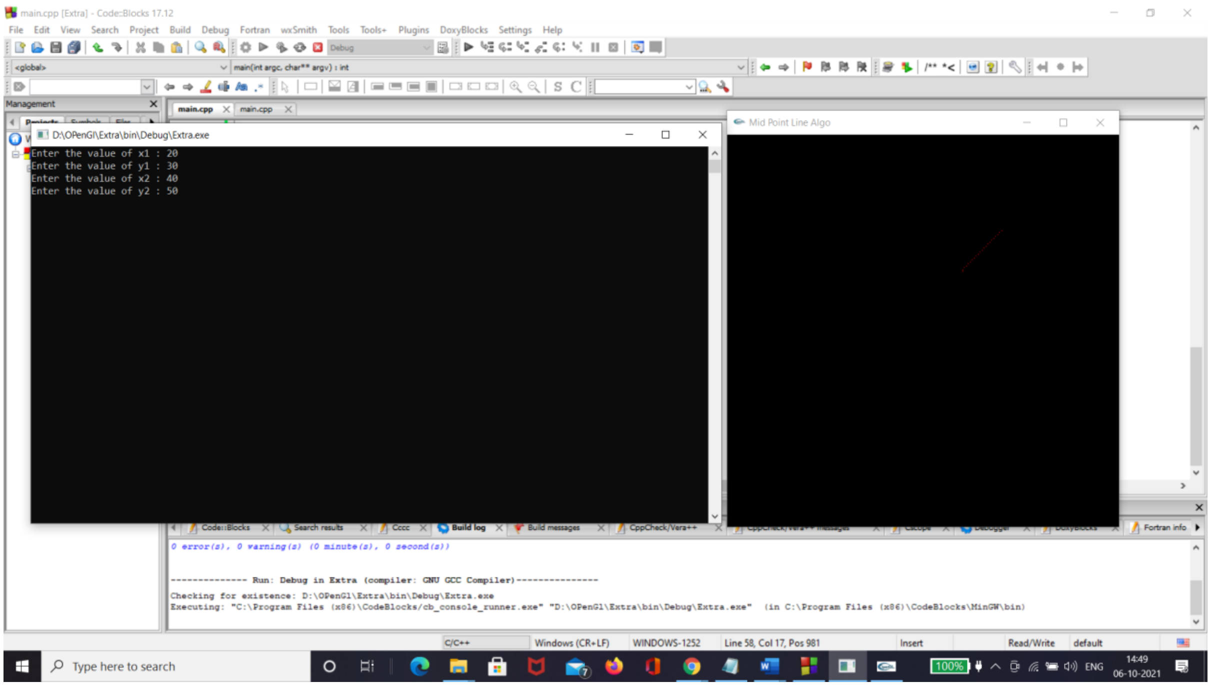
```
0 error(s), 0 warning(s) (0 minute(s), 0 second(s))


-------------- Run: Debug in Extra (compiler: GNU GCC Compiler)---------------
Checking for existence: D:\OPenGl\Extra\bin\Debug\Extra.exe
Executing: "C:\Program Files (x86)\CodeBlocks/cb_console_runner.exe" "D:\OPenGl\Extra\bin\Debug\Extra.exe"  (in C:\Program Files (x86)\CodeBlocks\MinGW\bin)
```

Mid Point Line Algorithm

```
#include<windows.h>
#include<GL/glu.h>
#include<GL/glut.h>
#include<stdlib.h>
#include<stdio.h>
float x1,x2,y1,y2;

void display(void)
{
float dy,dx,x,y,D_initial,dD,D_new;
dx=x2-x1;
dy=y2-y1;

D_initial = 2*(dy) - dx ;
dD = 2*(dy) - 2*(dx);

x=x1;
y=y1;
glBegin(GL_POINTS);
glVertex2i(x,y);
glEnd();

for (int x=x1 ; x<=x2 ; x++)
```

```
{
    if(D_initial<0){
        y = y;
        D_new = D_initial + 2*(dy) ;
        D_initial = D_new;
    }
    if(D_initial>=0){
        y= y + 1;
        D_new = D_initial + dD ;
        D_initial = D_new;
    }

glBegin(GL_POINTS);
glVertex2i(x,y);
glEnd();
}

glFlush();
}

void init(void)
{
glColor3f(1.0,0.0,0.0);
glMatrixMode(GL_PROJECTION);
glLoadIdentity();
gluOrtho2D(-100,100,-100,100);
}

int main(int argc, char** argv) {
printf("Enter the value of x1 : ");
scanf("%f",&x1);
printf("Enter the value of y1 : ");
scanf("%f",&y1);
printf("Enter the value of x2 : ");
scanf("%f",&x2);
printf("Enter the value of y2 : ");
scanf("%f",&y2);

glutInit(&argc, argv);
glutInitDisplayMode (GLUT_SINGLE | GLUT_RGB);
glutInitWindowSize (500, 500);
glutInitWindowPosition (100,100);
glutCreateWindow ("Mid Point Line Algo");
init();
glutDisplayFunc(display);
glutMainLoop();

return 0;
```

```
}
```



main.cpp [Extra] - Code::Blocks 17.12
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
D:\OPenGl\Extra\bin\Debug\Extra.exe
Mid Point Line Algo
Build log
Type here to search

```
Enter the value of x1 : 20
Enter the value of y1 : 30
Enter the value of x2 : 40
Enter the value of y2 : 50
```

```
0 error(s), 0 warning(s) (0 minute(s), 0 second(s))


-------------- Run: Debug in Extra (compiler: GNU GCC Compiler)---------------
Checking for existence: D:\OPenGl\Extra\bin\Debug\Extra.exe
Executing: "C:\Program Files (x86)\CodeBlocks/cb_console_runner.exe" "D:\OPenGl\Extra\bin\Debug\Extra.exe"  (in C:\Program Files (x86)\CodeBlocks\MinGW\bin)
```