Practical 5

Task 1 : Write a program to perform 2D-Rotation operations.

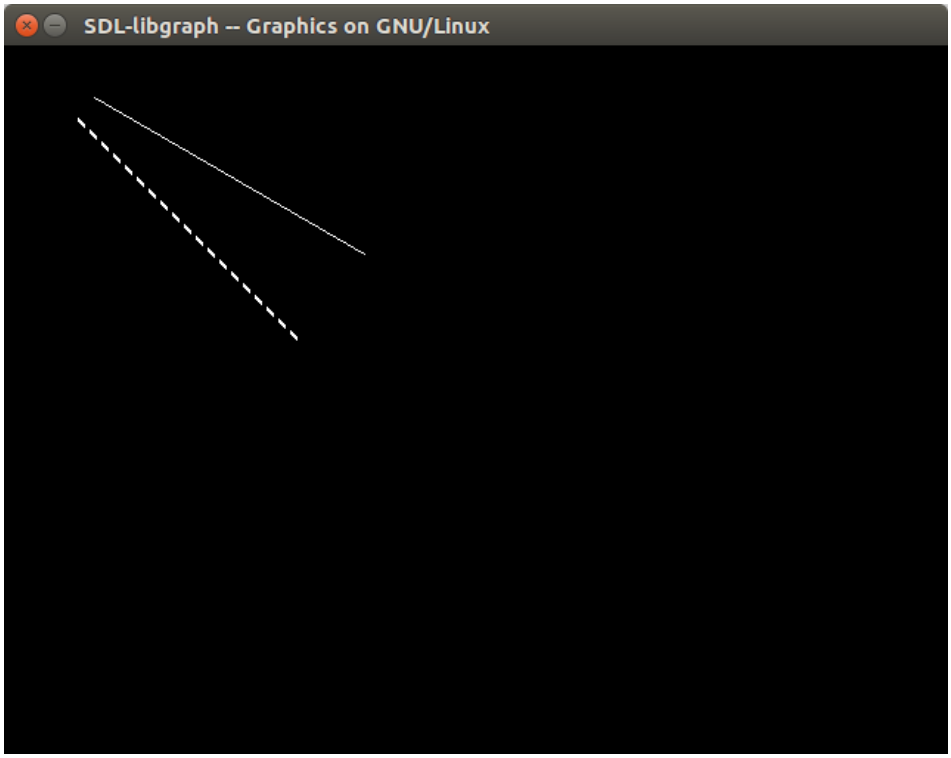
Source Code:

```
#include<graphics.h>
#include<stdio.h>
#include<math.h>

#define PI 3.14159265

int main()
{
  int gd = DETECT,gm;
  float xa,ya,xb,yb,xao,yao,xbo,ybo;
  printf("Rotation in 2D space\n");
  printf("Enter the starting point\n");
  scanf("%f %f",&xa,&ya);
  printf("Enter the ending point\n");
  scanf("%f %f",&xb,&yb);
  xao=xa,yao=ya,xbo=xb,ybo=yb;
  int rx,ry;
  double ang,val;
  printf("Enter coordinates for point about which should i rotate\n");
  scanf("%d %d",&rx,&ry);
  printf("Enter angle by which to rotate\n");
  scanf("%lf",&ang);
  xa=xa+rx;
  xb=xb+rx;
  ya=ya+ry;
  yb=yb+ry;
  val = PI / 180.0;
  ang=ang*val;
  float nxa=xa,nya=ya,nyb=yb,nxb=xb;
  xa = (nxa*cos(ang))-(nya*sin(ang));
  ya = (nxa*sin(ang))+(nya*cos(ang));
  xb = (nxb*cos(ang))-(nyb*sin(ang));
  yb = (nxb*sin(ang))+(nyb*cos(ang));
  xa=xa-rx;
  xb=xb-rx;
  ya=ya-ry;
```

```
    yb=yb-ry;

    initgraph(&gd,&gm,NULL);
    line(xa,ya,xb,yb);
    setlinestyle(DASHED_LINE,0,THICK_WIDTH);
    line(xao,yao,xbo,ybo);
    delay(5000);
    closegraph();
    return 0;
}
```

Output:

```
adnrs96@aditya-hp-envy-15-notebook-pc:/media/adnrs96/Local Disk/Local Disk(G)/CG
$ ./a.out
Rotation in 2D space
Enter the starting point
50
50
Enter the ending point
200
200
Enter coordinates for point about which should i rotate
0
0
Enter angle by which to rotate
-15
```



DASHED_LINE is the original line.