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Course -> BCA 6

Section -> A

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Ans 1)
```
#include<stdio.h>
#include<graphics.h>
int main()
{
  int sou(float num)
  {
    return num<0 ? num-0.5 : num+0.5;
  }
  int x1=100, x2=250, y1=100, y2=250, step;
  int gd=DETECT, gm;
  float x, y, m;
  int dx = x2-x1;
  int dy = y2-y1;
  m = dy/dx;
  if (dx>dy)
  {
    step = dx;
  }
  else
  {
    step = dy;
  }
  initgraph(&gd, &gm, "");
  outtextxy(x1, y1, "A");
  outtextxy(x2, y2, "B");
```

```
putpixel(x1, y1, BLUE);
x = x1, y = y1;
while (step>0)
{
  if (m<1)
  {
     x = x+1;
     y = y+m;
  }
  if (m>=1)
  {
   x = x+1/m
   y = y+1;
  }
   putpixel (round(x), round(y), BLUE);
   step--;
}
getch();
return 0;
}
```

ALGORITHM

- starting Coordinates = (x1, y1)
- Ending Coordinates = (x2, y2)

The points generation using DDA Algorithm involves the following steps

step-01 -> Calculate Δx, Δy and m from the given input. We know that the slopes of a straight line m is given and.

These parameters are calculated as:-

$\Delta x = x_2 - x_1$

$\Delta y = y_2 - y_1$

$m = \Delta y / \Delta x \Rightarrow m = (y_2 - y_1)/(x_2 - x_1)$

step-02 -> Find the numbers of steps or points in between the starting and ending co-ordinates

```
if (absolute(Δx) > absolute(Δy))
steps = absolute(Δx);
else
steps = absolute(Δy);
```

step-03 -> Suppose the current point is (x_p, y_p) & the next point is (x_{p+1}, y_{p+1})

find the next by following the below three cases:-

Three case

- Case-01 if m<1 → $x_{p+1} = \text{roundoff}(1 + x_p)$, $y_{p+1} = \text{roundoff}(m + y_p)$
- Case-02 if m=1 → $x_{p+1} = \text{roundoff}(1 + x_p)$, $y_{p+1} = \text{roundoff}\ 1 + y_p$
- Case-03 if m>1 → $x_{p+1} = \text{roundoff}(1/m + x_p)$, $y_{p+1} = \text{roundoff}(1 + y_p)$

Step-04 -> Keep repeating step-03 until end point is reached or the number of generated new points including the starting and ending points equals to the step count.