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Course - BCA 'A'

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Ans - 1
```
#include <stdio.h>
#include <graphics.h>
int main()
{
    int sam (Float num)
    {
        return num<0? num -0.5 : num + 0.5;
    }
    int x1 =100, x2 = 250, y1 = 100, y2 = 250, step;
    int get = 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;
    intgraph (&gd, &gm, " ");
    outtextxy (x1, y1, "A");
```

```
outtextxy (x2, y2, "B");
putpixel (x1, y1, RED);
   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 (sam(x), sam(y) RED);
         step --;
      }
      getch ()
      return 0;
   }
```

Algorithm

- Strating coordinates = (x_0, y_0)
- Ending coordinates = (x_n, y_n)

The points generation using DDA algorithm involves the following steps :

Step 2 → Calculate $\Delta x, \Delta y$ & M from the given input. we know that the slope of a straight line M is given as

These parameters are calculated as

- $\Delta x = x_n - x_0$
- $\Delta y = y_n - y_0$
- $M = \Delta y / \Delta x$ ⇒ $M = \dfrac{y_n - y_0}{x_n - x_0}$

Step 2 → Find the number of steps or points in between the starting and ending coordinates

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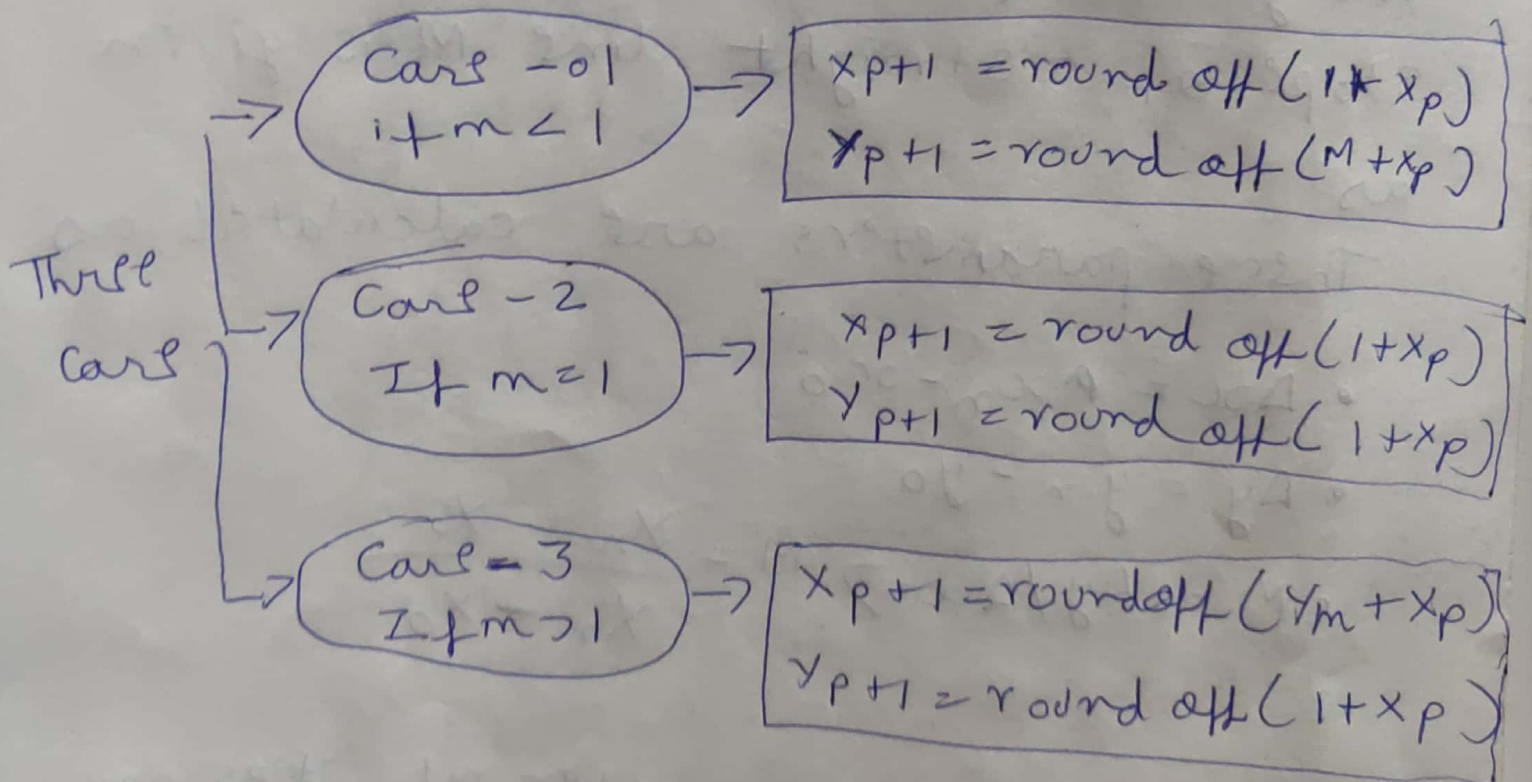
else

steps = absolute(Δy);

step 3 → Suppose the current point is (x_p, y_p) and the next point is (x_{p+1}, y_{p+1}) Find the next by following the below three cases :-

Three Cases

Three Cases

Case - 01
if $m < 1$ → x_{p+1} = round off $(1 * x_p)$
y_{p+1} = round off $(M + x_p)$

Case - 2
If $m = 1$ → x_{p+1} = round off $(1 + x_p)$
y_{p+1} = round off $(1 + x_p)$

Case = 3
If $m > 1$ → x_{p+1} = roundoff $(y_m + x_p)$
y_{p+1} = round off $(1 + x_p)$

step 4 → Keep repeating step - 3 until the end points (including the starting and ending points) equals to the steps count.