Assignment - B5

Problem Statement :

Write a C++/Java program to generate Hillbert curve using concept of fractals

Objectives :

To understand and learn concept of fractals

To implement Hillbert curve using fractals.

Outcomes:

1) After completion of this assignment, students will be able to understand and implement various space fitting curves.

2) To understand concept of fractals.

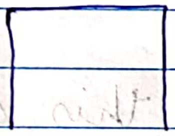
3) Implement Hillbert curve using concept of fractals.

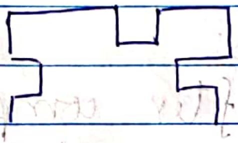
Theory:

Fractals:-

The objectives which are having smooth surface and regular shapes we generally described by using equations. But natural object have irregular shape.

Hillbert curve : This curve also called as Peano Curve and is easy to implement. The curve begins with an initial ~~curv~~ square. The generation of curve requires successive approximations. In the first approximation we are dividing the square into 4 quadrants and then drawing the curve which connects the centers points of each quadrant. The second approximation will be to further subdivide each of 4 quadrants and draw curves which connects the centre points of their finer submissions before moving the next major quadrant



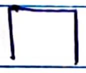
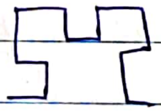
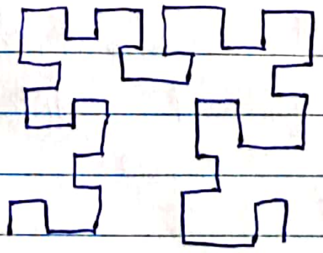


Algorithm :

```
Hilbert (int u, int r, int d, int l, int h, int i, int x,
            int y) {
      if (i<=0)
            return
         i--
            Hilbert (r, u, d, d, h, i, x, y);
            move (u, h, x, y);
            Hilbert (u, r, d, l, h, i, x, y);
            move (r, h, x, y);
            Hilbert (u, r, d, l, h, i, x, y);
            move (d, h, x, y);
            Hilbert (l, d, r, u, h, i, x, y);
      }
      move (int j, int h, int &x, int &y) {
```

```
int xl = x , yl = y;
 switch(j){
        case 1: y -= h ; break;
        case 2: x += h ; break;
        case 3: y += h ; break;
        case 4: x -= h ; break;
  }
 DDA (x1, x2, x, y);
}
```

Test Case

Input	Output	Status
level 1		
level 2		
level 3:		Success

Conclusion :

Thus hillbert curve was implemented using concept of fractals.