RAJESH

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algo assignment No.10 (Bs)

Title: HILBERT curve.

Problem statement: write a c++ program to generate Hilbert curve using concept of Fractals

objective: To implement the concept of Hilbert curve in c++ program.

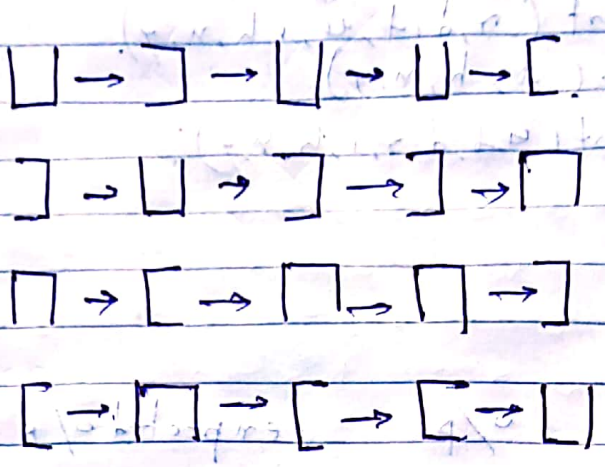
outcome: student will learn how to implement Hilbert curve in cpp program using concept of fractals.

Theory: fractals:
1) They are complex pictures generated by a computer from a single formula.
2) They're created using recursion, meaning one formula is repeated with slightly different values over and over again taking into account the results from previous fractals

Hilbert curve:
continuous fractal space filling curve first described by German mathematician Hilbert.
The base model for Hilbert curve is

The Hilbert curve is also a special version of quadtree any image processing function that benefits from the use of quadtree may also use Hilbert curve

cup subdivision rules:



Algorithm:

1.) Move

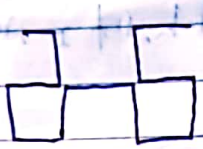
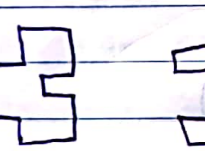
```
void move (int j, int h, int x, int y).
{
    if (j==1)
        y-=h
    else if (j==2)
        x+=h
    else if (ij==3)
        y+=h
    else if (j==4)
        x-=h
}
```

2). Hilbert.

```
void Hilbert(int x, int d, int t, int u, int i, int h)
        int x, int y)
{
    if (i>0)
        i--;
    hilbert(d,x,u,t,i,h,x,y)
    hilbert(
    move(x,h,x,y)
    hilbert(x,d,t,u,i,h,x,y);
```

```
move (d, h, x, y)
hilbert (r, d, l, u, i, h, x, y).
move (d, h, x, y)
hilbert (u, d, d, r, i, h, x, y);
}
```

Testcases:

I/p	o/p	expected o/p	status
1st order		same	pass
2nd order		same	pass
3rd order.		same	pass

conclusion: we have successfully implemented and studied Hilbert curve.