SARASWATI Education Society's
SARASWATI College of Engineering

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Experiment no:-10

Aim:- WAP to implement a fern Algorithm

Resource Required:-
Turbo c, notepad, wordpad, paint, stationary

Theory:-
In computer graphics, fern Algorithm Refers to method used to generate and Render Realistic image of ferns and similar foilage One of the most famous Algorithm for simulating The Appearance of fern is Barnsley fern, which uses fractales to create a visually appealing Representation of fern leaves

Key concept:-
① Fractal geometry:-
Fern exhibit self-similarity, where smaller part of fern Resemble whole fractal geometry capture this property, allowing for modeling of complex natural form using simple Recursive Algorithms.

② Barnsley Fern:-
The Barnsley fern is specific example created by mathematician Michael Barnsley in 1988 it uses iterative function system (IFS) to generate fractal that Resemble a fern

3. Iterate function system (IFS):-
The Barnsley fern is defined by four Affine transformation, each with an associated Probability that dictate how often each Transf^n is applied

The transformations are:
Transformation 1:- Produce stem of the fern

Transformation 2:- Generate the left leaf

Transformation 3:- generate Right leaf

Transformation 4:- create the smaller leaf

4] Rendering:-
To generate fern, a point is initialized, and one of transformation is Randomly selected based on probabilities. This process is Repeated iteratively producing series of point that coms to form the fern shape. The point are then plotted to create final image

conclusion:-
Fern Algorithm, particularly Barnsley fern, demonstrate power of fractal geometry in simulating natural forms in cg. Their Appln extends beyond just fern to a wide Range of natural phenomena, showcasing beauty and complexity of nature through mathematical modeling