

# MINISTERUL EDUCAȚIEI, CULTURII ȘI CERCETĂRII AL REPUBLICII MOLDOVA

**Universitatea Tehnică a Moldovei**

# Facultatea Calculatoare, Informatică şi Microelectronică Departamentul Inginerie Software și Automatică

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Report

*Final Eman*

***of Computer Graphics***

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# The condition / conditions of the problems:

Make a tree. Set the angles of the branches of the tree according to Perlin noise values. Adjust the noise values over time to animate the tree. See if you can get it to appear as if it is blowing in the wind. Can you add leaves or flowers to the end of the branches? What if the leaves can fall off the tree. And comment to the program.

1. **The code with comments:**

The program code, having relevant comments in it: float angle;

float time = 0;

float wind = 0.01;

int leaves = 100;

int[] leafX = new int[leaves];

int[] leafY = new int[leaves];

boolean[] leafFallen = new boolean[leaves];

void setup() {

  size(600, 600);

  strokeWeight(2);

  angle = radians(20);

  // initialize leaf positions and fallen state

  for (int i = 0; i < leaves; i++) {

    leafX[i] = int(random(width));

    leafY[i] = int(random(height));

    leafFallen[i] = false;

  }

}

void draw() {

  background(9, 204, 230);

  rect(0, height-20,width,height);

  // set the angle of the branches using Perlin noise

  float noiseVal = noise(time);

  angle = map(noiseVal, 0, 1, radians(20), radians(40));

  // animate the tree by incrementing the time variable

  time += 0.01;

  // draw the fractal tree

  translate(width/2, height);

  branch(150);

  // add leaves to the end of the branches with a random chance

  for (int i = 0; i < leaves; i++) {

    if (random(1) < 0.05 && !leafFallen[i]) {

      fill(0, 255, 0);

      ellipse(leafX[i], leafY[i], 20, 10);

      rotate(20);

    }

  }

  // simulate leaves falling off the tree in the direction of the wind

  for (int i = 0; i < leaves; i++) {

    if (leafFallen[i]) {

      leafY[i] += wind;

      if (leafY[i] > height) {

        leafFallen[i] = false;

        leafX[i] = int(random(width));

        leafY[i] = int(random(height));

      }

    }

  }

}

void branch(float len) {

  // draw the current branch

  line(0, 0, 0, -len);

  translate(0, -len);

  // if the length of the current branch is greater than a certain value, draw its child branches

  if (len > 4) {

    pushMatrix();

    rotate(angle);

    branch(len \* 0.67);

    popMatrix();

    pushMatrix();

    rotate(-angle);

    branch(len \* 0.67);

    popMatrix();

  }

}

1. **Screen printing of program execution;**

