

# 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

*Laboratory work n.5*

***of Computer Graphics***

Checked by:

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1. **The purpose of the laboratory work (formulated by the student according to the problem to be solved);**

Learning and exercising the GC concepts, understanding and using them to create laboratories work which represents and simulates the use in the field.

# The condition / conditions of the problems:

Using forces, simulate a helium-filled balloon floating upward and bouncing off the top of a window. Can you add a wind force that changes over time, perhaps according to Perlin noise?

# The program code, having relevant comments in it:

let balloon;

function setup() {

  createCanvas(1000, 1000);

  balloon = new Balloon();

}

function draw() {

  background('skyblue');

  balloon.show();

  balloon.update();

  balloon.hitCelling();

  // HELIUM FORCE

  // Part 1: Calculate a force

  // in what direction is this vector pointing?

  // what is the vector's magnitude (amount)?

  let helium = createVector(0, -0.008);

  // Part 2a: Apply the force

  // apply this helium "force"

  balloon.applyForce(helium);

  // WIND FORCE

  if (mouseIsPressed) {

    // Part 1: Calculate a force

    // In what direction is the vector pointing?

    // OR, what direction does the wind blow?

    // What is the magnitude of the wind vector?

    // OR, how strong is the wind?

    let wind = createVector(0.1, 0);

    // Part 2a: Apply the force

    balloon.applyForce(wind);

  }

}

class Balloon {

  constructor() {

    // start at 0 and wait until a force

    // is applied to move the object

    this.acc = createVector(0, 0);

    this.vel = createVector(0, 0);

    this.pos = createVector(width / 5, height);

    this.topspeed = 1;

  }

  // Part 2b

  applyForce(force) {

    // add each force to acc

    this.acc.add(force);

  }

  // Part 2c

  update() {

    // basic motion algorithm

    // acc + vel + pos

    this.vel.add(this.acc);

    // this.vel.limit(this.topspeed);

    this.pos.add(this.vel);

    // reset acc so it does not accumulate

    // (what happens if we remove this?)

    this.acc.mult(0)

  }

hitCelling(){

    if (this.pos.y <= -10){

        this.vel.y \*= -0.5;

        this.pos.y = -10;

      }

    if (this.pos.x >= width-150){

        this.vel.x \*= -0.8;

        this.pos.x = width-150;

      }

  if (this.pos.x <= 40){

        this.vel.x \*= -0.8;

        this.pos.x = 40;

      }

    }

  show() {

    fill('white');

     fill(255);

  ellipse(this.pos.x+50, this.pos.y+40, 40, 40);

  //Right Ear

  ellipse(this.pos.x+150, this.pos.y+40, 40, 40);

  //Head

  fill(255);

  ellipse(this.pos.x+100, this.pos.y+100, 150, 150);

  //Left Eyeball

  ellipse(this.pos.x+75, this.pos.y+80, 30, 30);

  //Left Iris

  fill(0);

  ellipse(this.pos.x+75, this.pos.y+84, 20, 20);

  //Right Eyeball

  fill(255);

  ellipse(this.pos.x+130, this.pos.y+80, 30, 30);

  //Right Iris

  fill(0);

  ellipse(this.pos.x+130, this.pos.y+84, 20, 20);

  //Nose

  ellipse(this.pos.x+104, this.pos.y+115, 40, 20);

  //Mouth

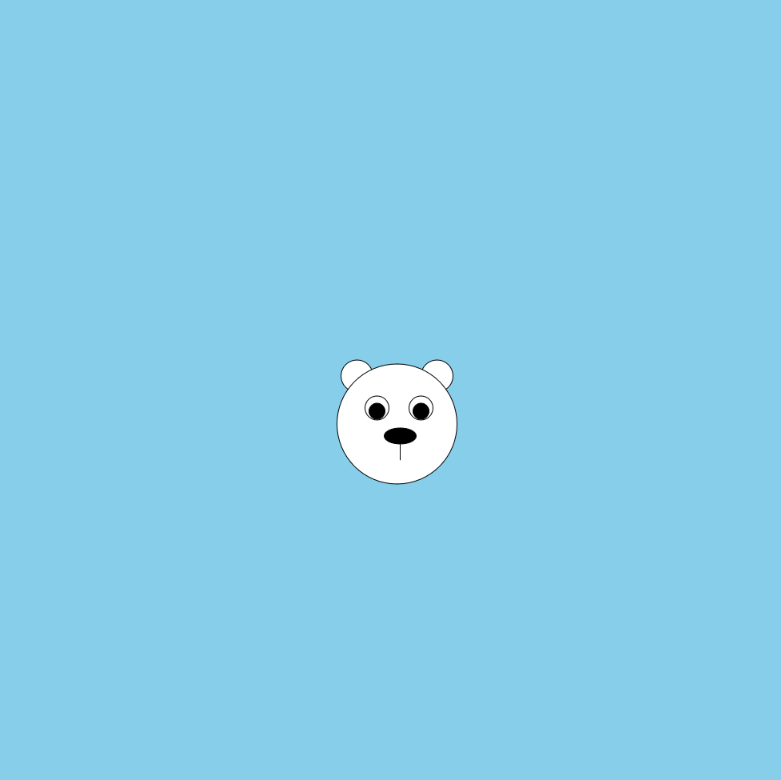
  fill(0);

 line(this.pos.x+104, this.pos.y+120, this.pos.x+104, this.pos.y+145);

  }

}

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



# The student's conclusions regarding the content of the laboratory work with personal reflections on what was achieved; difficulties encountered and how he/she got over them (if he/she got over them). Where did he find the answer? (specify the links to sources that help you to get the answer).

The laboratory work had a big impact in the quality of my development as a future Software Engineer in Computer Graphics. I enjoyed the process, developed my creativity and codding skills, understood better the IDE and the code functionality.

Biography: <http://learningprocessing.com/examples/>

<https://codebeautify.org/javaviewer>

<https://else.fcim.utm.md/course/view.php?id=573>