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.

2. **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?

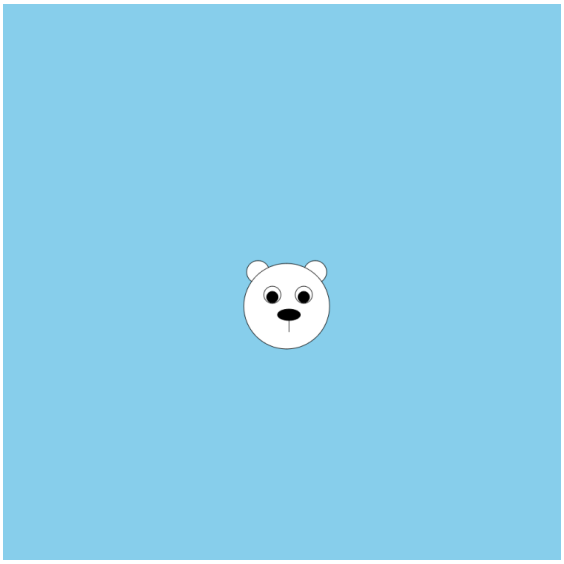
3. **The program code, having relevant comments in it:**

```
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);

  }

}
```

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



5. **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