



# **SEN2212**

## **Data Structure and Algorithms II**

### **Project Report**

Group No: 7

Project Title: Zoo information system

Lab Section No: 902

Student ID: 2100829

Student Full Name: Bora Hamarat

## 1. Introduction

### 1.1 Purpose/Project Proposal

*The purpose of the system is to allow a zoo manager to spatially sort and organize the animals in the zoo and to allow customers to access their information. The customer can access the information of the animals in more detail one by one and learn which habitat they are in and what order they are in that habitat. In this way, he gets help in reaching his destination and having detailed information. The administrator, on the other hand, has access to any method to maintain the hierarchy in the zoo.*

### 1.2 Software language is JAVA / Project runs in Console.

### 1.3 Data Structures

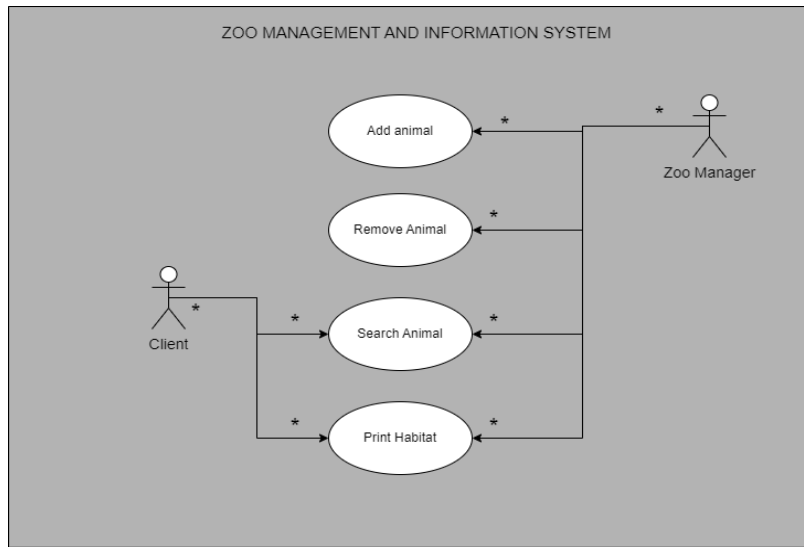
*Tree and linked list data structures were used in the system. Animals were positioned linearly using LinkedList. It allowed the animal to be added to the beginning or the end of the list. In addition, the use of a two-way linked list allowed access to the habitat from both directions. It increased the efficiency of the system in insertion and deletion situations. Another data structure, the tree, allowed the parent ancestors of each animal registered in the system to be listed in taxonomic order. With the information given in each addition, the upper taxonomic groups of that animal are positioned in the tree, and the taxonomic order of that animal is returned linearly in each detailed search.*

### 1.4 Work Partitioning

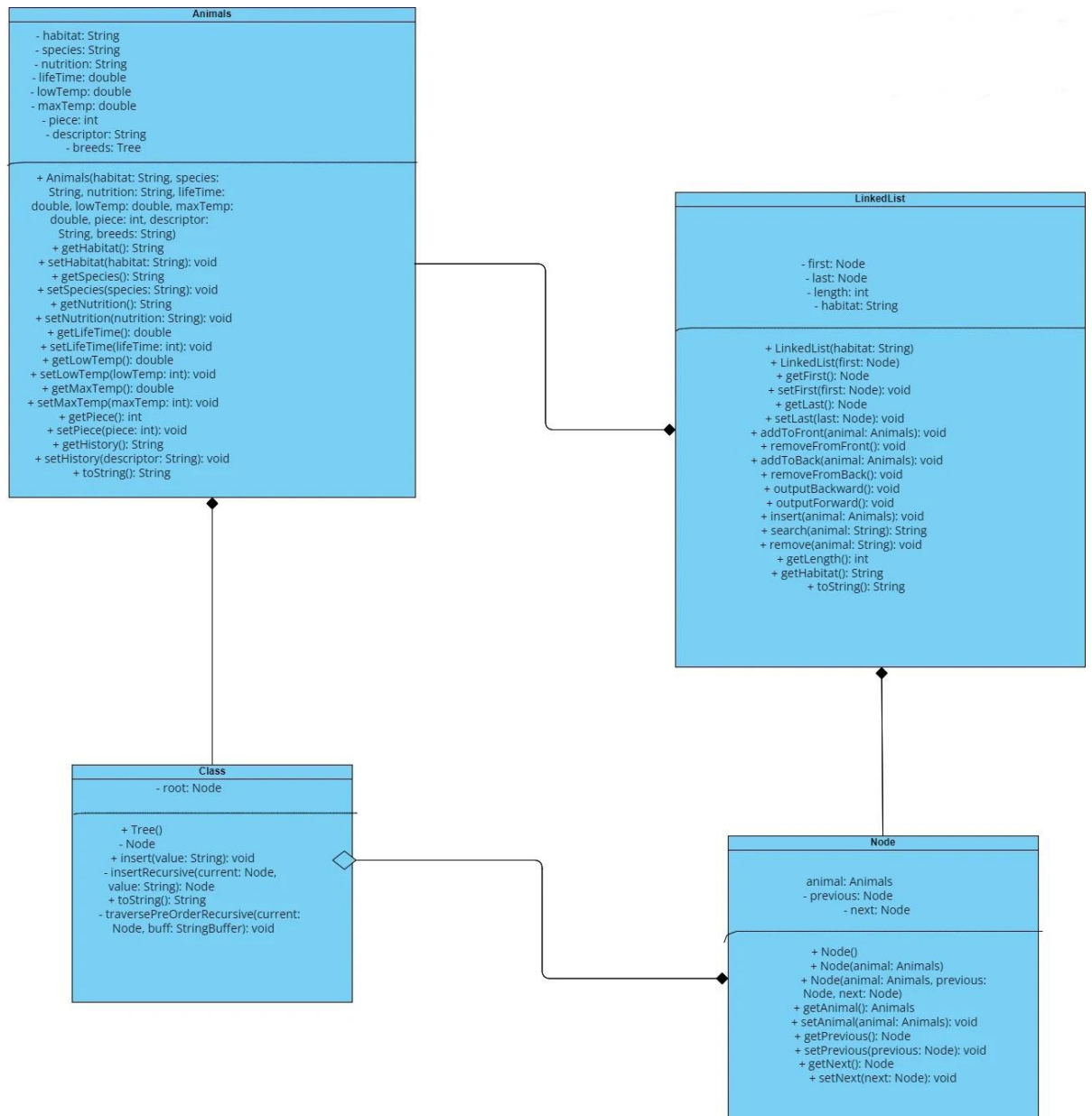
Name	Role	Date	Description
Bora Hamarat 2100829	Front-end developer	17.04.2021-29.05.2023	<i>I implemented the Linked list data structure and designed console interface.</i>
İsmail Saidoğlu 1906188	Front-end developer	17.04.2023-29.05.2023	<i>I implemented tree data structure.</i>

## 2. Architectural Representation

### 2.1 Use Case Diagram



## 2.2 Class Diagram



### 3. Application

```
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Animal.java - Visual Studio Code

// Animal.java
package Project;

import java.util.Arrays;

public class Animal {
    private String habitat;
    private String species;
    private String nutrition;
    private double lifeSpan;
    private double lowTemp;
    private double maxTemp;
    private int place;
    private String descriptor;
    private True breeds = new True();

    public Animal(String habitat, String species, String nutrition, double lifeSpan, double lowTemp, double maxTemp,
        int place, String descriptor) {
        this.habitat = habitat;
        this.species = species;
        this.nutrition = nutrition;
        this.lifeSpan = lifeSpan;
        this.lowTemp = lowTemp;
        this.maxTemp = maxTemp;
        this.place = place;
        this.descriptor = descriptor;
        this.breeds = breeds;
    }

    public String getHabitat() { //returns habitat attribute
        return habitat;
    }

    public void setHabitat(String habitat) {
        this.habitat = habitat;
    }

    public String getSpecies() { //returns species attribute
        return species;
    }

    public void setSpecies(String species) {
        this.species = species;
    }

    public String getNutrition() { //returns nutrition attribute
        return nutrition;
    }

    public void setNutrition(String nutrition) {
        this.nutrition = nutrition;
    }

    public double getLifeSpan() { //returns lifeSpan attribute
        return lifeSpan;
    }

    public void setLifeSpan(int lifeSpan) {
        this.lifeSpan = lifeSpan;
    }

    public double getLowTemp() { //returns lowTemp attribute
        return lowTemp;
    }
}
```

```
File Edit Selection View Go Run Terminal Help
Animal.java - Visual Studio Code

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package Project;

import java.util.Arrays;

public class Animal {
    private String habitat;
    private String species;
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    private int place;
    private String descriptor;
    private True breeds = new True();

    public Animal(String habitat, String species, String nutrition, double lifeSpan, double lowTemp, double maxTemp,
        int place, String descriptor) {
        this.habitat = habitat;
        this.species = species;
        this.nutrition = nutrition;
        this.lifeSpan = lifeSpan;
        this.lowTemp = lowTemp;
        this.maxTemp = maxTemp;
        this.place = place;
        this.descriptor = descriptor;
        this.breeds = breeds;
    }

    public String getHabitat() { //returns habitat attribute
        return habitat;
    }

    public void setHabitat(String habitat) {
        this.habitat = habitat;
    }

    public String getSpecies() { //returns species attribute
        return species;
    }

    public void setSpecies(String species) {
        this.species = species;
    }

    public String getNutrition() { //returns nutrition attribute
        return nutrition;
    }

    public void setNutrition(String nutrition) {
        this.nutrition = nutrition;
    }

    public double getLifeSpan() { //returns lifeSpan attribute
        return lifeSpan;
    }

    public void setLifeSpan(int lifeSpan) {
        this.lifeSpan = lifeSpan;
    }

    public double getLowTemp() { //returns lowTemp attribute
        return lowTemp;
    }

    public void setLowTemp(int lowTemp) {
        this.lowTemp = lowTemp;
    }

    public double getMaxTemp() { //returns maxTemp attribute
        return maxTemp;
    }

    public void setMaxTemp(int maxTemp) {
        this.maxTemp = maxTemp;
    }

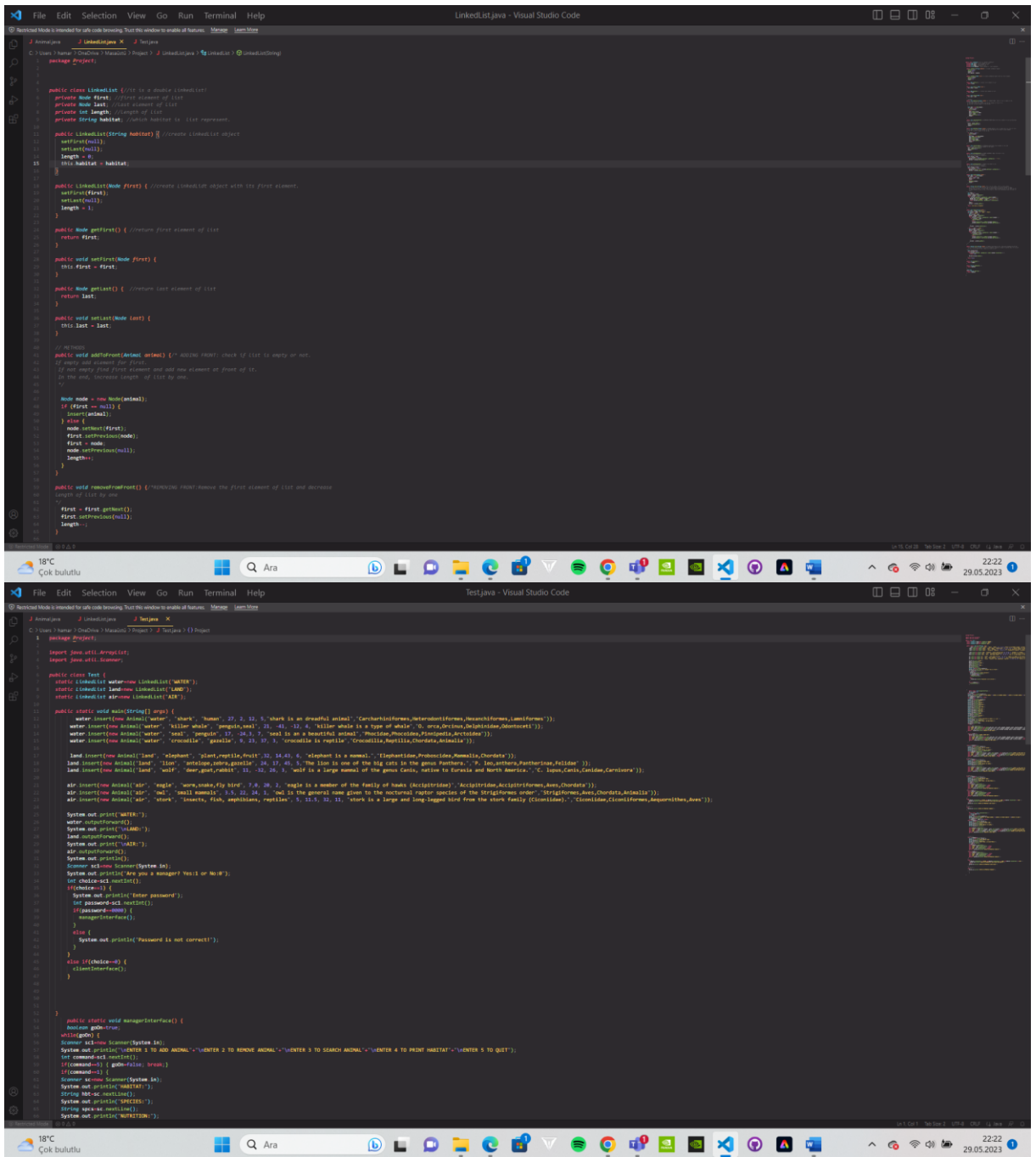
    public int getPlace() { //returns place attribute
        return place;
    }

    public void setPlace(int place) {
        this.place = place;
    }

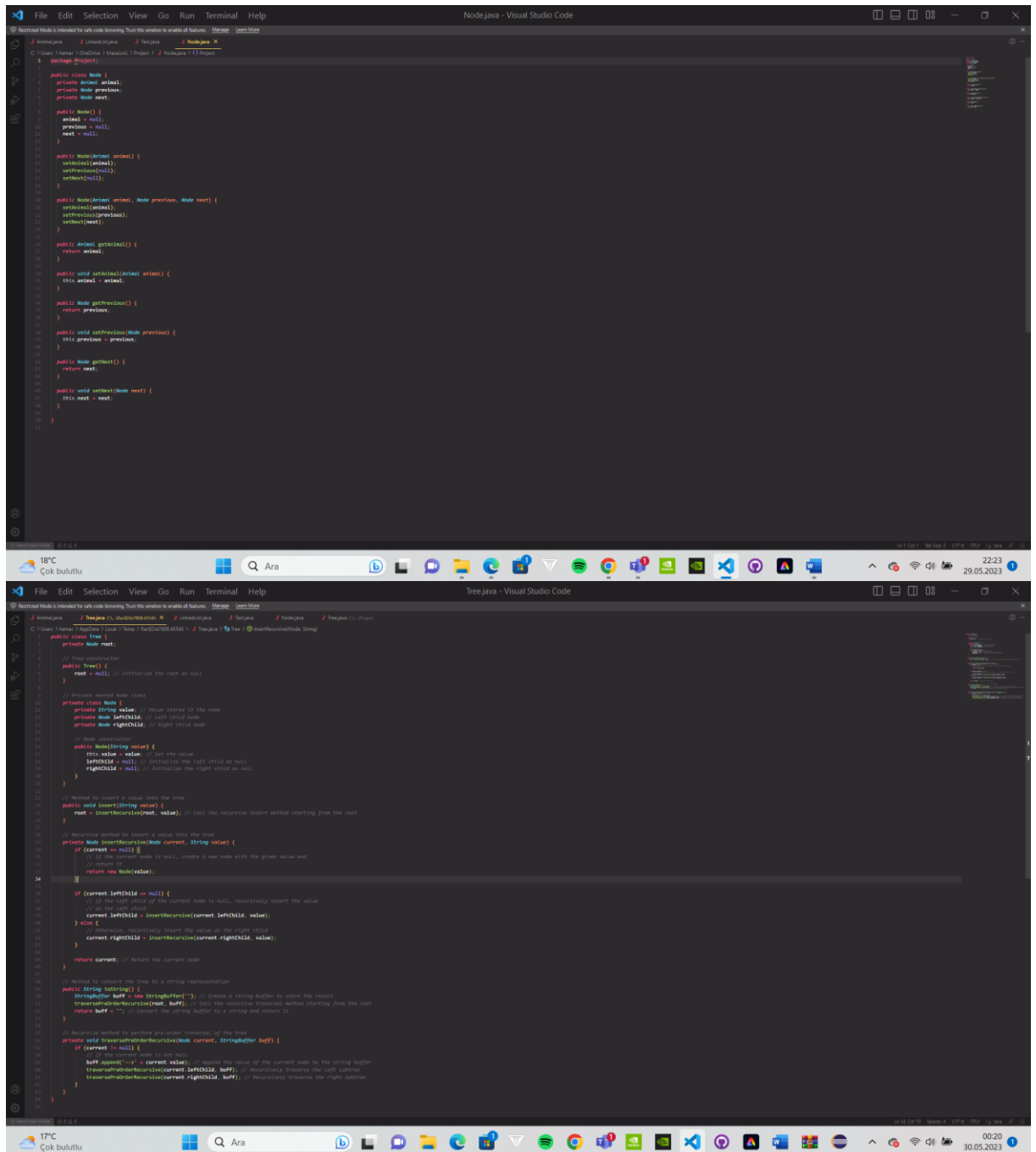
    public String getDescriptor() { //returns descriptor attribute
        return descriptor;
    }

    public void setDescriptor(String descriptor) {
        this.descriptor = descriptor;
    }

    @Override
    public String toString() { //other end breeds object access. Prints the toString()
        return "HABITAT: " + habitat + " | SPECIES: " + species + " | NUTRITION: " + nutrition + " | " +
            "LIFE SPAN: " + lifeSpan + " | TEMPERATURE RANGE: " + lowTemp + " - " + maxTemp + " | " + "PLACE: " +
            place + " | " + "DESCRIPTION: " + descriptor + " | Breeds: " + breeds;
    }
}
```







#### 4. Conclusion / Summary

We have completed the zoo management and information software system, which enables both the management of the information in the zoo and the access to this information.

#### 5. References

Data structures & problem-solving using java.