

**Gebze Technical University  
Computer Engineering**

**CSE 222 - 2018 Spring**

**HOMEWORK 2 REPORT**

**NURULLAH GÜNDOĞDU  
161044108**

**AYŞE ŞERBETCİ TURAN**

# 1 INTRODUCTION

## 1.1 Problem Definition

In this project I created a single linklist structure called ExperimentList. It holds the experiments in this structure. Experiments have 5 different parameters. ExperimentList It lists the experiments according to the days, there is a link between the experiments and there is also a connection between the days.

In ExperimentList class;

```
addExp(Experiment):
getExp(day, index) :
setExp(day, index, experiment):
removeExp(day, index):
listExp(day):
removeDay(day):
orderDay(day):
orderExperiments():
```

In Experiment class;

```
setup (String):
day(integer):
time(Time):
completed(booleann):
accuracy(float):
```

## 1.2 System Requirements

Adding elements to the list. I do this by looking at the days of experimentla. I'm doing the order of the day according to the order.

I'm removing the element from the list. I do this by removing the element in the entered order of the entered day.

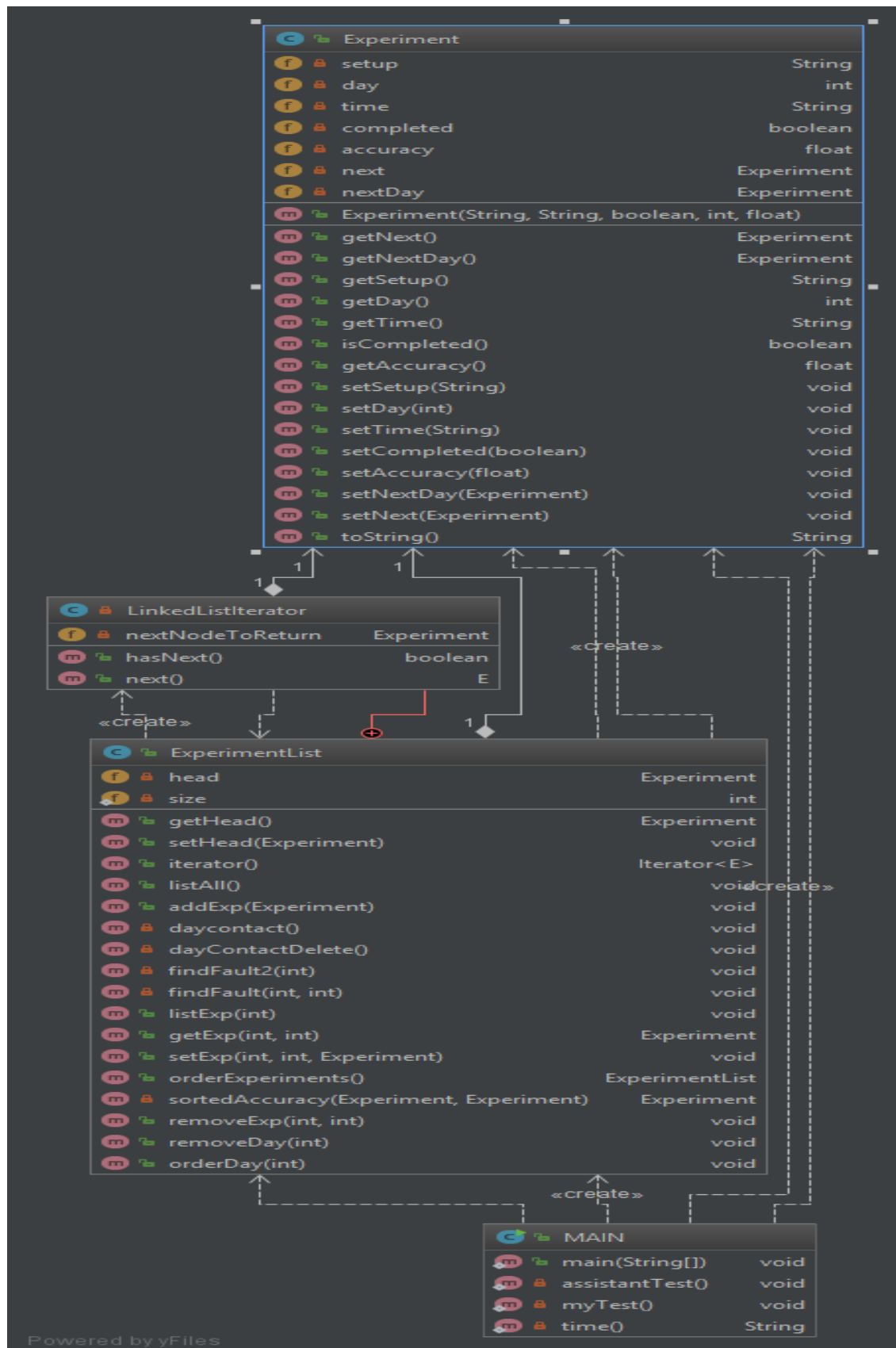
I'm performing day-to-day removal from the list. It does this by deleting all the elements of the day.

Sorting. Sorting according to the accuracy score.

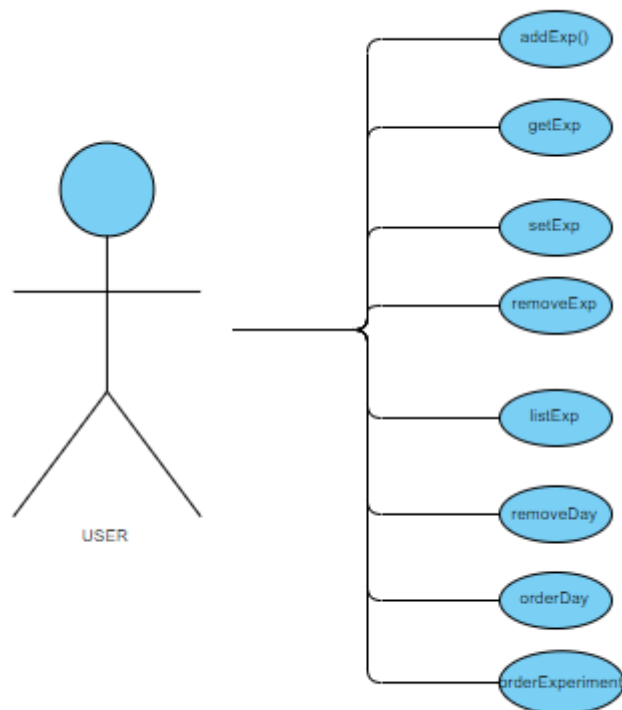
It's set. This operation is changing the new experiment entered in the day and next element.

## 2 METHOD

## 2.1 Class Diagrams



## 2.2 Use Case Diagrams



## 2.3 Other Diagrams (optional)

## 2.4 Problem Solution Approach

I first created the Experiment class then created the ExperimentList class. I created a linkedList structure and iterator structure in my ExperimentList class. I added the experiments one by one. Then I tried the methods on the ExperimentList object and applied the desired operations.

## 2.5 Algorithm Analysis

1- addExp(Experiment);

This function is navigated until the list is null in the algorithm. At the end of the Trial day list entered in the worst case, nobody gets the runtime line of this algorithm because it will be visited at the end of the list. This is the time period for this algorithm  $T(n) = O(n)$  dir.

2- getExp(day, index) :

In this function algorithm, iterator will be navigated until you find the desired experiement. In the worst case, the day of the desired experiment and the end of

the list at the end of the list in this case, the entire duration of this algorithm takes the linear time to run the algorithm. Therefore, the working time of this algorithm is  $T(n) = O(n)$ .

3- setExp(day, index, experiment):

In this function algorithm the list is navigated with iterator until the desired day and. In the worst case, if the desired day and index at the end of the list in this case the entire list will be visited because the working time of this algorithm takes linear time. Therefore, the working time of this algorithm is  $T(n) = O(n)$ .

4- removeExp(day, index):

In this function algorithm, iterator will be navigated until you find the desired experiment. In the worst case, the day of the experiment to be deleted and the index at the end of the list, in this case the entire list will be visited, this algorithm takes a linear time to run. Therefore, the working time of this algorithm is  $T(n) = O(n)$ .

5- listExp(day):

In this function algorithm, the list is navigated until it is null. In the worst case, if the Experiment day and the index are entered at the end of the list, this algorithm will take a linear time because the entire list will be visited. Therefore, the working time of this algorithm is  $T(n) = O(n)$ .

6- removeDay(day):

In this function algorithm, the list is navigated with iterator until you find the desired day. In the worst case, if you want to delete the list at the end of the list in this case the entire list will be visited because this algorithm takes a linear time. Therefore, the working time of this algorithm is  $T(n) = O(n)$ .

7- orderDay(day):

This function algorithm to go to the end of the list with iterator. Each function is called another function. In this function, there is a loop in that loop, until the list turns to frost. In this case, because the entire list will be visited 2 times, the runtime of this algorithm takes linear time. Therefore, the working time of this algorithm is  $T(n) = O(n^2)$ .

8- orderExperiments():

This function algorithm to go to the end of the list with iterator. Each function is called another function. In this function, there is a loop in that loop, until the list turns to frost. In this case, because the entire list will be visited 2 times, the runtime of this algorithm takes linear time. Therefore, the working time of this algorithm is  $T(n) = O(n^2)$ .

## 3 RESULT

### 3.1 Test Cases

```
ExperimentList list = new ExperimentList();
Random generator = new Random();
generator.setSeed(3);
boolean completed = true;
float acc;
int day;
String time = "timeInfo";
for(int i=0; i<20; i++) {
    System.out.println("-----");
    day = generator.nextInt( bound: 4) ;
    String setup = "setup"+Integer.toString(i);
    acc = (float) (i*0.1);
    Experiment e = new Experiment(setup, time , completed, day, acc);
    System.out.println("Add new experiment:");
    System.out.println(e.toString());
    list.addExp(e);
    list.listAll();
}

System.out.println("-----");
System.out.println("getExp(0,3) Result:");
Experiment e = list.getExp( day: 0, index: 3);
System.out.println(e.toString());
System.out.println("-----");
System.out.println("setExp(0,3), accuracy=1.0");
e.setAccuracy((float) 1.0);
list.setExp( day: 0, index: 3, e);
e = list.getExp( day: 0, index: 3);
System.out.println("-----");
System.out.println("getExp Result:");
e = list.getExp( day: 0, index: 3);
System.out.println(e.toString());
System.out.println("-----");
System.out.println("listExp(0) Result:");
list.listExp( day: 0);
System.out.println("-----");
System.out.println("removeExp(0,0) Result:");
System.out.println(list.getExp( day: 0, index: 0).toString());
list.removeExp( day: 0, index: 0);
list.listAll();
System.out.println("-----");
System.out.println("removeExp(1,0) Result:");
```

### 3.2 Running Results

[illegible]













[illegible]





```
removeDay(3) Result:
List experiment view:
Experiment{setup='setup4', day=0, time='timeInfo', accuracy=0.4, completed=true}
Experiment{setup='setup8', day=0, time='timeInfo', accuracy=0.8, completed=true}
Experiment{setup='setup13', day=0, time='timeInfo', accuracy=1.0, completed=true}
Experiment{setup='setup14', day=0, time='timeInfo', accuracy=1.4, completed=true}
Experiment{setup='setup17', day=0, time='timeInfo', accuracy=1.7, completed=true}
Experiment{setup='setup0', day=2, time='timeInfo', accuracy=0.0, completed=true}
Experiment{setup='setup1', day=2, time='timeInfo', accuracy=0.1, completed=true}
Experiment{setup='setup5', day=2, time='timeInfo', accuracy=0.5, completed=true}
Experiment{setup='setup7', day=2, time='timeInfo', accuracy=0.7, completed=true}
Experiment{setup='setup10', day=2, time='timeInfo', accuracy=1.0, completed=true}
List day view:
Experiment{setup='setup4', day=0, time='timeInfo', accuracy=0.4, completed=true}
Experiment{setup='setup0', day=2, time='timeInfo', accuracy=0.0, completed=true}
```

```

ExperimentList list = new ExperimentList();
Random generator = new Random();
generator.setSeed(3);
boolean completed = true;
float acc;
int day;
String time = "timeInfo";
for(int i=0; i<20; i++) {
    System.out.println("-----");
    day = generator.nextInt( bound: 4) ;
    String setup = "setup"+Integer.toString(i);
    acc = (float) (i*0.1);
    Experiment e = new Experiment(setup, time , completed, day, acc);
    System.out.println("Add new experiment:");
    System.out.println(e.toString());
    list.addExp(e);
    list.listAll();
}

System.out.println("-----");
System.out.println("getExp(0,3) Result:");
Experiment e = list.getExp( day: 0, index: 3);
System.out.println(e.toString());
System.out.println("-----");
System.out.println("setExp(0,3), accuracy=1.0");
e.setAccuracy((float) 1.0);
list.setExp( day: 0, index: 3, e);
e = list.getExp( day: 0, index: 3);
System.out.println("-----");
System.out.println("getExp Result:");
e = list.getExp( day: 0, index: 3);
System.out.println(e.toString());
System.out.println("-----");
System.out.println("listExp(0) Result:");
list.listExp( day: 0);
System.out.println("-----");
System.out.println("removeExp(0,0) Result:");
System.out.println(list.getExp( day: 0, index: 0).toString());
list.removeExp( day: 0, index: 0);
list.listAll();
System.out.println("-----");
System.out.println("removeExp(1,0) Result:");

```