

**Gebze Technical University  
Computer Engineering**

**CSE 222 - 2019 Spring**

**HOMEWORK 2 REPORT**

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# 1 INTRODUCTION

## 1.1 Problem Definition

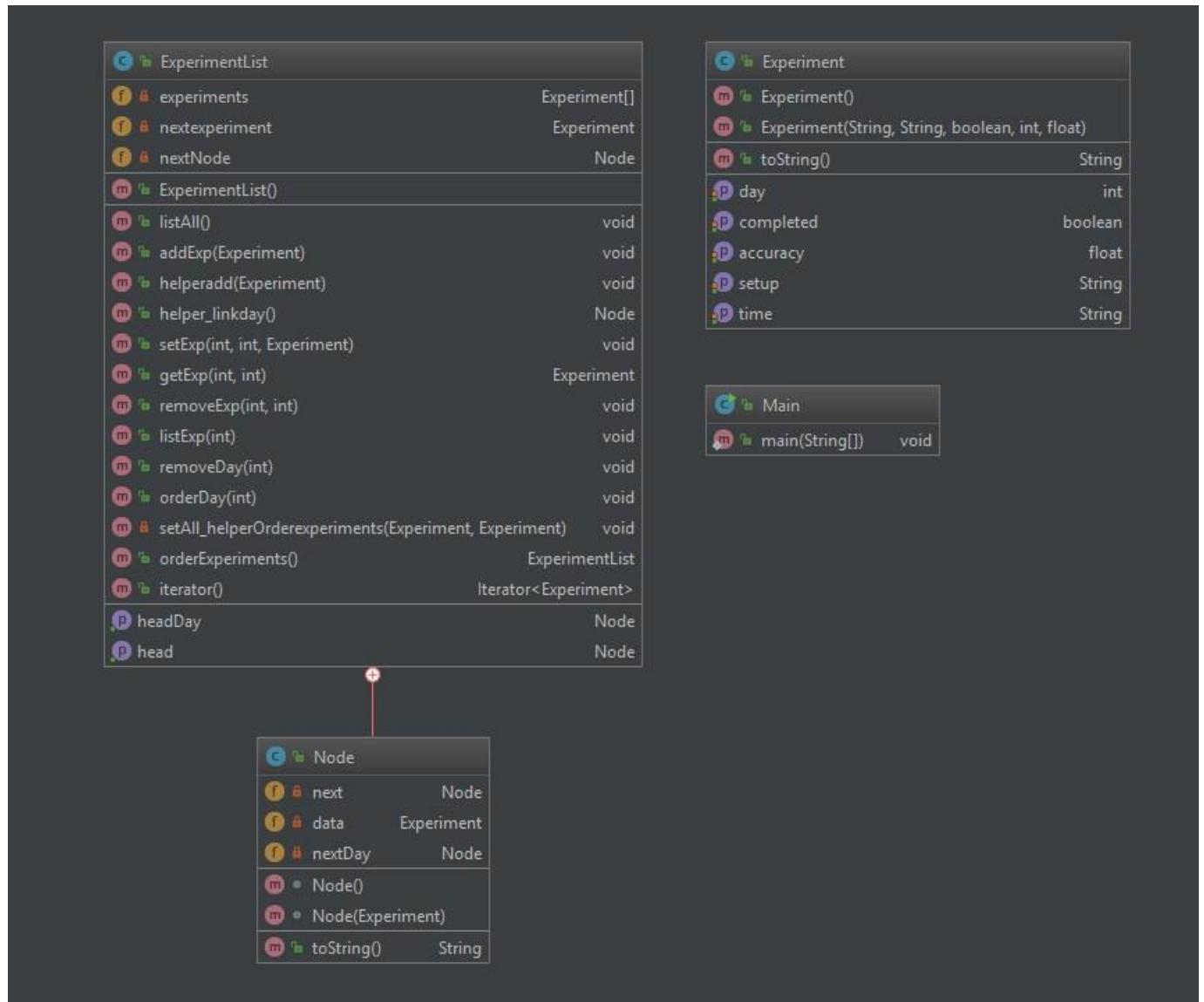
Keeping the some machine learning experiments and their results. Our purpose are initiliaze some methods for arrange experiments. AddExp method add an experiment in list. SetExp method set an experiment in list. GetExp method get an experiment in list. Remove methods for removing one experiment or experiment in a given day. Order methods for order experiments according to accuracy or day. ListExp method list all completed experiments. What requested of us is coded for arrangement in list of experiments for request to users.

## 1.2 System Requirements

- 1.2.1 First of all ExperimentList object (our list) and Experiment objects (our experiment data) should be created.
- 1.2.2 Experiment object created with taken all Experiment data field (Setup, Time, Completed, Day, Accuracy) constructure.
- 1.2.3 ExperimentList has an inner class and inner class object which is Node have to be create for connecting experiments in a list.
- 1.2.4 Node class has to head and data to keep head of list adress and experiment informations.
- 1.2.5 Iterable class should have next method to Access next list element and hasNext method to check next element is null or not.
- 1.2.6 Iterable class object should be created for turning with a loop to show experiment informations.

## 2 METHOD

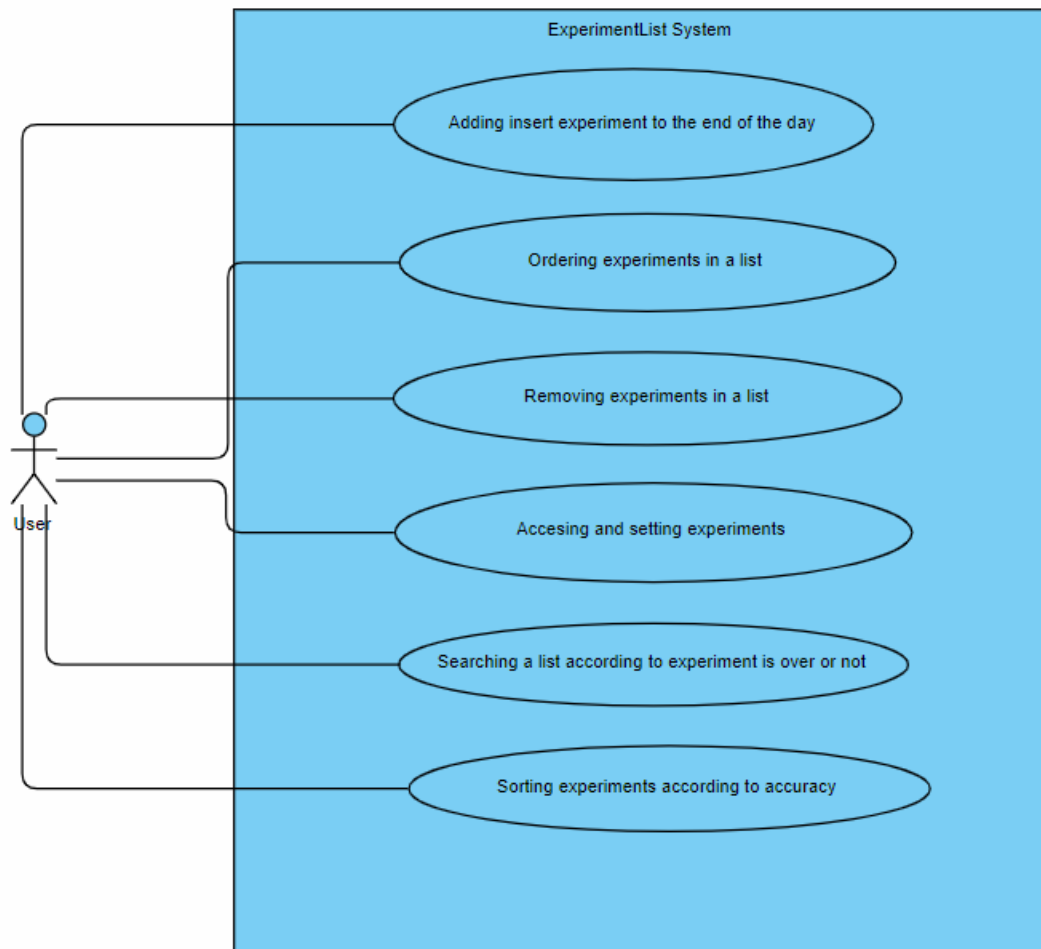
### 2.1 Class Diagrams



## 2.2 Use Case Diagrams

Users can do all of operations.

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## 2.3 Other Diagrams (optional)

I don't need any other diagram.

## 2.4 Problem Solution Approach

In this code I used linkedlist for connect experiments and I initilize for add, set, get, remove , order, and list (all completed experiments) operations to arrange experiments.ExperimentList class has a nodes (I initilize as a class and use next and data fields for accesig information about experiments) to use experiments object for connecting.Node is a inner class and node constructures mission is create a head of list and turn experiment to node object for connecting. I override iterator method for accesing and checking experiment's informations and I use iterator to show output to users.My

ExperimentList class is implement iterable interface for using iterator method and other next hasNext methods.I test and connect all experiments using initiliazing methods in a list.

### 3 RESULT

#### 3.1 Test Cases

3.1.1 I create an empty list and 15 diffrent experiments.

3.1.2 I addExp method call to add all 15 diffrent experiments in a list and show the list to user on the screen.

3.1.3 I get the given day and index element and show the screen.

3.1.4 I set the given day and index element and show the screen to show with get method.

3.1.5 I removeExp method call to remove given day and index element in a list.

3.1.6 I removeDay method call to remove given day elements in a list.

3.1.7 I listExp method call to print all completed experiments in a list.

3.1.8 I orderDay method call to order given day elements in a list.

3.1.9 I orderExp method call to order all experiments in the list and return a new list without changing our principal list.

3.1.10 I call after all methods and print output the screen with iterator in main class.

## 3.2 Running Results

```
"C:\Program Files\Java\jdk1.8.0_171\bin\java.exe" ...  
List experiment view:  
Experiment{setup='First Experiment', day=1, time='10:45:20', accuracy=7.0, completed=true}  
Experiment{setup='Second Experiment', day=1, time='06:30:20', accuracy=6.0, completed=true}  
Experiment{setup='Fourth Experiment', day=1, time='02:10:09', accuracy=2.0, completed=true}  
Experiment{setup='Fifth Experiment', day=1, time='02:10:09', accuracy=7.0, completed=true}  
Experiment{setup='sixth Experiment', day=1, time='02:10:09', accuracy=9.0, completed=true}  
Experiment{setup='First Experiment', day=2, time='05:28:40', accuracy=17.0, completed=false}  
Experiment{setup='Second Experiment', day=2, time='02:10:09', accuracy=5.0, completed=true}  
Experiment{setup='Third Experiment', day=2, time='02:10:09', accuracy=10.0, completed=true}  
Experiment{setup='Fourth Experiment', day=2, time='02:10:09', accuracy=4.0, completed=true}  
Experiment{setup='Fifth Experiment', day=2, time='02:10:09', accuracy=11.0, completed=true}  
Experiment{setup='Third Experiment', day=3, time='08:24:10', accuracy=2.0, completed=false}  
Experiment{setup='Third Experiment', day=3, time='02:10:09', accuracy=13.0, completed=true}  
Experiment{setup='Third Experiment', day=3, time='02:10:09', accuracy=11.0, completed=true}  
Experiment{setup='Fourth Experiment', day=3, time='02:10:09', accuracy=3.0, completed=true}  
List day view:  
Experiment{setup='First Experiment', day=1, time='10:45:20', accuracy=7.0, completed=true}  
Experiment{setup='First Experiment', day=2, time='05:28:40', accuracy=17.0, completed=false}  
Experiment{setup='Third Experiment', day=3, time='08:24:10', accuracy=2.0, completed=false}
```

### AddExp method result

```
Set and Get Experiments Method  
  
GetExp : Experiment{setup='Fourth Experiment', day=1, time='02:10:09', accuracy=2.0, completed=true}  
Output is :  
AfterSetExp GetExp : Experiment{setup='Fourth Experiment', day=1, time='02:10:09', accuracy=2.0, completed=true}  
  
Remove Experiment Method  
Removing experiment is  
Experiment{setup='First Experiment', day=1, time='10:45:20', accuracy=7.0, completed=true}  
Output is :  
Experiment{setup='Second Experiment', day=1, time='06:30:20', accuracy=6.0, completed=true}  
Experiment{setup='Fourth Experiment', day=1, time='02:10:09', accuracy=2.0, completed=true}  
Experiment{setup='Fifth Experiment', day=1, time='02:10:09', accuracy=7.0, completed=true}  
Experiment{setup='sixth Experiment', day=1, time='02:10:09', accuracy=9.0, completed=true}  
Experiment{setup='First Experiment', day=2, time='05:28:40', accuracy=17.0, completed=false}  
Experiment{setup='Second Experiment', day=2, time='02:10:09', accuracy=5.0, completed=true}  
Experiment{setup='Third Experiment', day=2, time='02:10:09', accuracy=10.0, completed=true}  
Experiment{setup='Fourth Experiment', day=2, time='02:10:09', accuracy=4.0, completed=true}  
Experiment{setup='Fifth Experiment', day=2, time='02:10:09', accuracy=11.0, completed=true}  
Experiment{setup='Third Experiment', day=3, time='08:24:10', accuracy=2.0, completed=false}  
Experiment{setup='Third Experiment', day=3, time='02:10:09', accuracy=13.0, completed=true}  
Experiment{setup='Third Experiment', day=3, time='02:10:09', accuracy=11.0, completed=true}  
Experiment{setup='Fourth Experiment', day=3, time='02:10:09', accuracy=3.0, completed=true}
```

### Get Set and RemoveExp method results

```

Remove Day Method
Removing Day is 2
Output is :
Experiment{setup='Second Experiment', day=1, time='06:30:20', accuracy=6.0, completed=true}
Experiment{setup='Fourth Experiment', day=1, time='02:10:09', accuracy=2.0, completed=true}
Experiment{setup='Fifth Experiment', day=1, time='02:10:09', accuracy=7.0, completed=true}
Experiment{setup='sixth Experiment', day=1, time='02:10:09', accuracy=9.0, completed=true}
Experiment{setup='Third Experiment', day=3, time='08:24:10', accuracy=2.0, completed=false}
Experiment{setup='Third Experiment', day=3, time='02:10:09', accuracy=13.0, completed=true}
Experiment{setup='Third Experiment', day=3, time='02:10:09', accuracy=11.0, completed=true}
Experiment{setup='Fourth Experiment', day=3, time='02:10:09', accuracy=3.0, completed=true}

Order Day Method
Ordering Day is 3
Output is :
Experiment{setup='Second Experiment', day=1, time='06:30:20', accuracy=6.0, completed=true}
Experiment{setup='Fourth Experiment', day=1, time='02:10:09', accuracy=2.0, completed=true}
Experiment{setup='Fifth Experiment', day=1, time='02:10:09', accuracy=7.0, completed=true}
Experiment{setup='sixth Experiment', day=1, time='02:10:09', accuracy=9.0, completed=true}
Experiment{setup='Third Experiment', day=3, time='02:10:09', accuracy=13.0, completed=true}
Experiment{setup='Third Experiment', day=3, time='02:10:09', accuracy=11.0, completed=true}
Experiment{setup='Fourth Experiment', day=3, time='02:10:09', accuracy=3.0, completed=true}
Experiment{setup='Third Experiment', day=3, time='08:24:10', accuracy=2.0, completed=false}

```

## RemoveDay and OrderDay method results

```

Order Experiments Method
Output is :
Experiment{setup='Third Experiment', day=3, time='02:10:09', accuracy=13.0, completed=true}
Experiment{setup='Third Experiment', day=3, time='02:10:09', accuracy=11.0, completed=true}
Experiment{setup='sixth Experiment', day=1, time='02:10:09', accuracy=9.0, completed=true}
Experiment{setup='Fifth Experiment', day=1, time='02:10:09', accuracy=7.0, completed=true}
Experiment{setup='Second Experiment', day=1, time='06:30:20', accuracy=6.0, completed=true}
Experiment{setup='Fourth Experiment', day=3, time='02:10:09', accuracy=3.0, completed=true}
Experiment{setup='Fourth Experiment', day=1, time='02:10:09', accuracy=2.0, completed=true}
Experiment{setup='Third Experiment', day=3, time='08:24:10', accuracy=2.0, completed=false}

ListExp Experiment Method
Output is : for day 1
Experiment{setup='Second Experiment', day=1, time='06:30:20', accuracy=6.0, completed=true}
Experiment{setup='Fourth Experiment', day=1, time='02:10:09', accuracy=2.0, completed=true}
Experiment{setup='Fifth Experiment', day=1, time='02:10:09', accuracy=7.0, completed=true}
Experiment{setup='sixth Experiment', day=1, time='02:10:09', accuracy=9.0, completed=true}

```

## OrderExp and ListExp method results

## 4 Complexity of Methods

Method Names	Complexity of Methods	How I calculated
AddExp	$\Theta(n^2)$	Nested loop (Function call and loop)
GetExp	$\Theta(1)$	No Loop
SetExp	$\Theta(1)$	No Loop
RemoveExp	$\Theta(n)$	1 Loop
RemoveDay	$\Theta(3n)$	3 loop not nested
OrderExp	$\Theta(n^2+n)$	1 Nested loop and loop
OrderDay	$\Theta(n^2)$	Nested loop
ListExp	$\Theta(n)$	1 Loop
ListAll	$\Theta(2n)$	2 Loop not nested
Helperadd(my h.f)	$\Theta(n)$	1 Loop
Helperlink(my h.f)	$\Theta(n)$	1 Loop

h.f = Helper function