Gebze Technical University

Computer Engineering

CSE222-2020-SPRING

# Homework-4_part2 Report

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# 1)Problem Solutions Approach

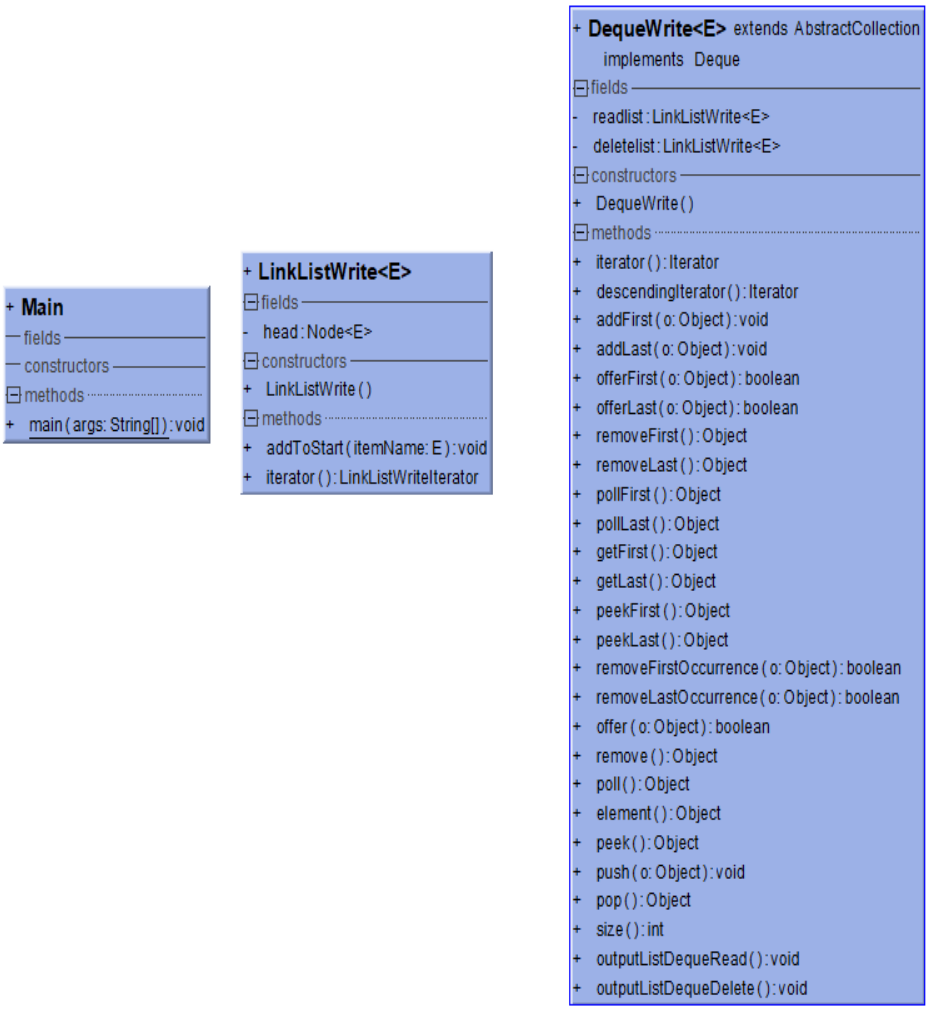
***First, two linked lists were kept in the DequeWrite structure.***

***Deque interface implements  to this class and extend with AbstractCollection.***

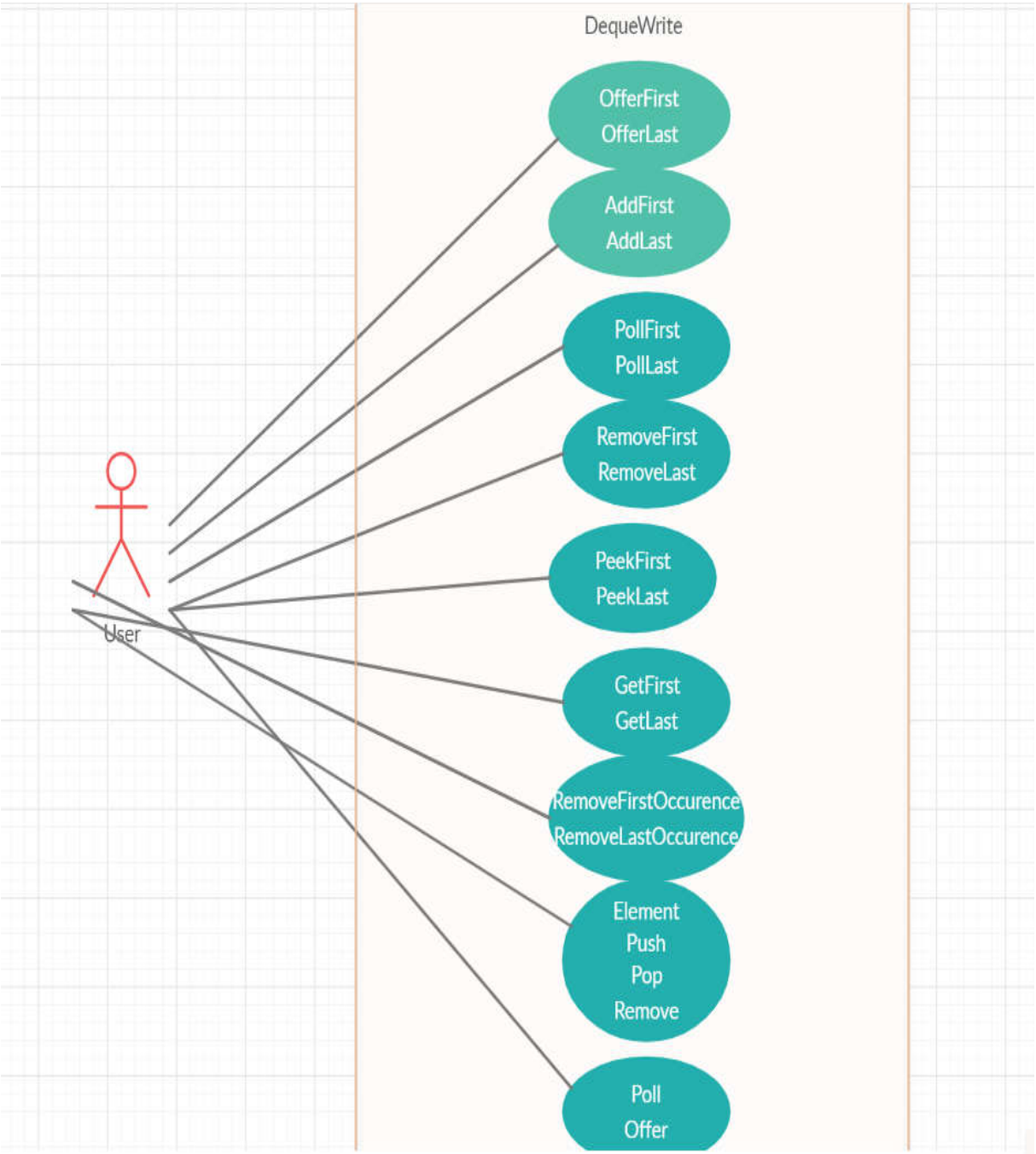
***Two iterators were defined in the class. One of them extends from start to finish, the other extends from start to finish.***

***If the first item is to be added, it is first searched in the other linked list in the deque structure. if the item is present, the node in the deque is used otherwise it will be recreated. The first item in the linked list has been deleted, but added to another linked list in the deque structure.***

# 2) Class Diagram



# 3)Use Case Diagram



## *4)Test Case*

a) If the first item is to be added, it is first searched in the other linked list in the deque structure. if the item is present, the node in the deque is used otherwise it will be recreated.(AddFirst)

```
DequeWrite dq=new DequeWrite();

    dq.addFirst( o: "Gebze Teknik Universitesi");
    dq.addFirst( o: "Yildiz Teknik Universitesi");
    dq.outputListDequeRead();
```

```
**Deque Read**
Yildiz Teknik Universitesi
Gebze Teknik Universitesi
```

b) If the last item is to be added, it is first searched in the other linked list in the deque structure. if the item is present, the node in the deque is used otherwise it will be recreated.(AddLast)

```
dq.addLast( o: "Istanbul Teknik Universitesi");
dq.outputListDequeRead();
```

```
**Deque Read**
Yildiz Teknik Universitesi
Gebze Teknik Universitesi
Istanbul Teknik Universitesi
```

c) If the first item is to be added, it is first searched in the other linked list in the deque structure. if the item is present, the node in the deque is used otherwise it will be recreated. (OfferFirst)

```
dq.offerFirst( o: "Bogazici Universitesi");
dq.outputListDequeRead();
```

```
**Deque Read**
Bogazici Universitesi
Yildiz Teknik Universitesi
Gebze Teknik Universitesi
Istanbul Teknik Universitesi
```

d) If the last item is to be added, it is first searched in the other linked list in the deque structure. if the item is present, the node in the deque is used otherwise it will be recreated.(OfferLast)

```
dq.offerLast( o: "Sakarya Universitesi");
dq.outputListDequeRead();
```

```
**Deque Read**
Bogazici Universitesi
Yildiz Teknik Universitesi
Gebze Teknik Universitesi
Istanbul Teknik Universitesi
Sakarya Universitesi
```

e) The first item in the linked list has been deleted, but added to another linked list in the deque structure.(removeFirst)

```
dq.removeFirst();
dq.outputListDequeRead();
```

```
**Deque Read**
Bogazici Universitesi
Yildiz Teknik Universitesi
Gebze Teknik Universitesi
Istanbul Teknik Universitesi
Sakarya Universitesi
**Deque Read**
Yildiz Teknik Universitesi
Gebze Teknik Universitesi
Istanbul Teknik Universitesi
Sakarya Universitesi
```

f) The end item in the linked list has been deleted, but added to another linked list in the deque structure (removeLast)

```
dq.removeLast();
dq.outputListDequeRead();
```

```
**Deque Read**
Yildiz Teknik Universitesi
Gebze Teknik Universitesi
Istanbul Teknik Universitesi
Sakarya Universitesi
**Deque Read**
Yildiz Teknik Universitesi
Gebze Teknik Universitesi
Istanbul Teknik Universitesi
```

g) The first item in the linked list has been deleted, but added to another linked list in the deque structure.(pollFirst)

```
dq.pollFirst();
dq.outputListDequeRead();
```

```
**Deque Read**
Yildiz Teknik Universitesi
Gebze Teknik Universitesi
Istanbul Teknik Universitesi
Sakarya Universitesi
**Deque Read**
Gebze Teknik Universitesi
Istanbul Teknik Universitesi
Sakarya Universitesi
```

h) The end item in the linked list has been deleted, but added to another linked list in the deque structure.(pollLast)

```
dq.pollLast();
dq.outputListDequeRead();
```

```
**Deque Read**
Gebze Teknik Universitesi
Istanbul Teknik Universitesi
Sakarya Universitesi
**Deque Read**
Gebze Teknik Universitesi
Istanbul Teknik Universitesi
```

i) In linked list returns the first item.(GetFirst)

```
System.out.println("********************");
System.out.println("GETFIRST:"+dq.getFirst());
System.out.println("GETLAST:"+dq.getLast());
System.out.println("********************");
```

```
**Deque Read**
Gebze Teknik Universitesi
Istanbul Teknik Universitesi
********************
GETFIRST:Gebze Teknik Universitesi
GETLAST:Istanbul Teknik Universitesi
********************
```

I) In linked list returns the first item.(Peek)

```
dq.addFirst( o: "Ege Universitesi");
System.out.println("***************");
System.out.println("PEEKFIRST:"+dq.peekFirst());
System.out.println("PEEKLAST:"+dq.peekLast());
System.out.println("***************");
```

```
***************
PEEKFIRST:Ege Universitesi
PEEKLAST:Istanbul Teknik Universitesi
***************
```

j) Deletes the first item it encounters as it progresses from start to finish in the DequeWrite structure then deleted item added to linked list (removeFirstOccurence)

```
System.out.println("***removeFirstOccurrence****");
String array="Istanbul Teknik Universitesi";
if (dq.removeFirstOccurrence(array))
    System.out.println(array+": Founded and Delete");
else
    System.out.println("Not Found so not Delete");
System.out.println("****************************");
dq.outputListDequeRead();
```

```
****************
***removeFirstOccurrence****
Istanbul Teknik Universitesi: Founded and Delete
**************************
**Deque Read**
Gebze Teknik Universitesi
```

k) Deletes the first item it encounters as it progresses from finish to start in the DequeWrite structure then deleted item added to linked list.(removeLastOccurence)

```
System.out.println("***removeLastOccurrence****");
String array1="Gebze Teknik Universitesi";
if (dq.removeLastOccurrence(array1))
    System.out.println(array1+": Founded and Delete");
else
    System.out.println("Not Found so not Delete");
System.out.println("****************************");
dq.outputListDequeRead();
```

```
***removeLastOccurrence****
Gebze Teknik Universitesi: Founded and Delete
**************************
**Deque Read**
```

l) Adds a new element to the linked list(Offer)

```
dq.offer( o: "KAHRAMANMARAS");
dq.offer( o: "MALATYA");
dq.outputListDequeRead();
dq.offer( o: "ADANA");
dq.outputListDequeRead();
```

```
**Deque Read**
KAHRAMANMARAS
MALATYA
ADANA
```

m) Delete the trailing item and adds it to the other linked list.(remove)

```
dq.remove();
dq.outputListDequeRead();
```

```
**Deque Read**
KAHRAMANMARAS
MALATYA
ADANA
**Deque Read**
KAHRAMANMARAS
MALATYA
```

n) In linked list returns the first item(Element)

```
dq.offer( o: "ANTALYA");
System.out.println("********ELEMENT*********");
System.out.println("ELEMENT:"+dq.element());
System.out.println("************************");
dq.outputListDequeRead();
```

```
********ELEMENT*********
ELEMENT:KAHRAMANMARAS
************************
**Deque Read**
KAHRAMANMARAS
ANTALYA
```

o) In linked list returns the first item.(Peek)

```
dq.addFirst( o: "ANKARA");
dq.outputListDequeRead();
System.out.println("******PEEK******");
System.out.println("PEKK:"+dq.peek());
System.out.println("****************");
```

```
******PEEK******
PEKK:ANKARA
***************
```

p) delete the trailing item and adds it to the other linked list(POP)

```
dq.pop();
dq.outputListDequeRead();
```

```
**Deque Read**
ANKARA
KAHRAMANMARAS
ANTALYA
```

r) Adds an element to the end of linked list in the dequeWrite structure.(Push)

```
dq.push( o: "KOCAELI");
dq.outputListDequeRead();
```

```
**Deque Read**
ANKARA
KAHRAMANMARAS
ANTALYA
KOCAELI
```