

Karan Bharaj (T00693289). Assignment 2- COMP 2231

Question 1

To answer the question, the methods push(), pop(), peak(), isEmpty(), size(), toString() in ArrayStack.java were changed, hence all of these are executed in the driver (as shown below):

```
===== QUESTION 1 =====

--- New Stack "X" created using ArrayStack() ---

--- Check to see if X is empty- isEmpty() method ---
Is Stack "X" empty? true

--- Integer "3" pushed into X ---
Printout of Stack X:
3

--- Check to see if X is empty- isEmpty() method ---
false

--- Integer "4" pushed into X ---
Printout of Stack X:
4
3

--- Integer "7" pushed into X ---
Printout of Stack X:
7
4
3

--- pop() method executed on X ---
Integer popped: 7
Printout of Stack X:
4
3

--- peek() method executed on X ---
Integer peeked at: 4
Printout of Stack X:
4
3

--- Integer "2" pushed into X ---
Printout of Stack X:
2
4
3
```

- New ArrayStack() called "X" is created

- isEmpty() method checked on stack "X" when empty

- Push() and toString() methods called

- isEmpty() method checked on stack "X" when not empty

- Push() and toString() methods called

- Push() and toString() methods called

- Pop() and toString() methods called

- Peek() and toString() methods called

- Push() and toString() methods called

```

--- Integer "1" pushed into X ---
Printout of Stack X:
1
2
4
3

```

- Push() and toString() methods called

```

--- size() method called on X ---
Size of Stack X: 4

```

- Size() method called on stack

Question 2

“DropOutStack.java” created and implement as shown below:

```

===== QUESTION 2 =====

--- New Drop-out Stack "astronauts" created with a capacity of 5 ---

--- 5 names pushed into the "astronauts" Drop-out Stack ---
Karan Bharaj added to the "astronauts" Drop-out Stack
Chris Hadfield added to the "astronauts" Drop-out Stack
Neil Armstrong added to the "astronauts" Drop-out Stack
Yuri Gagarin added to the "astronauts" Drop-out Stack
Buzz Aldrin added to the "astronauts" Drop-out Stack

--- Contents of the "astronauts" Drop-out Stack ---
Buzz Aldrin
Yuri Gagarin
Neil Armstrong
Chris Hadfield
Karan Bharaj

--- Size method executed on "astronauts" Drop-out Stack ---
5

--- Peek method executed on "astronauts" Drop-out Stack ---
Buzz Aldrin

--- Another name pushed into the "astronauts" Drop-out Stack ---
Name added to the "astronauts" Drop-out Stack: Sally Ride
Size of the "astronauts" Drop-out Stack: 5

--- Contents of the "astronauts" Drop-out Stack ---
Sally Ride
Buzz Aldrin
Yuri Gagarin
Neil Armstrong
Chris Hadfield

```

- New Drop-out stack “astronauts” created

- Five names pushed to stack using the push() method. Each name added is shown using the peek() method

- Contents of the drop-out stack returned using the toString() method

- Size() method executed on Drop-out stack

- Peek() method executed on Drop-out stack

- Another name added using push(), and returned using peek(). Stack size also returned using size()

- Contents of the drop-out stack returned using the toString() method

```
--- Another name pushed into the "astronauts" Drop-out Stack ---
Name added to "astronauts": Guion Bluford
Total names in the "astronauts" Drop-out Stack: 5

--- Contents of the "astronauts" Drop-out Stack ---
Guion Bluford
Sally Ride
Buzz Aldrin
Yuri Gagarin
Neil Armstrong
```

- Another name added using `push()`, and returned using `peek()`. Stack size also returned using `size()`
- Contents of the drop-out stack returned using the `toString()` method

Question 3

```
===== QUESTION 3 =====

--- New Deque "astronauts" created with a capacity of 5 ---

--- Astronaut name add attempt to the front of the deque ---
Astronaut added to the front of the deque: Neil Armstrong

Size of deque: 1
Frontmost element of deque: Neil Armstrong
Rearmost element of deque: Neil Armstrong

Contents of deque:
Neil Armstrong

-----

--- Astronaut name add attempt to the front of the deque ---
Astronaut added to the front of the deque: Chris Hadfield

Size of deque: 2
Frontmost element of deque: Chris Hadfield
Rearmost element of deque: Neil Armstrong

Contents of deque:
Chris Hadfield
Neil Armstrong

-----

--- Astronaut name add attempt to the front of the deque ---
Astronaut added to the front of the deque: Buzz Aldrin

Size of deque: 3
Frontmost element of deque: Buzz Aldrin
Rearmost element of deque: Neil Armstrong

Contents of deque:
Buzz Aldrin
Chris Hadfield
Neil Armstrong

-----

--- Astronaut name add attempt to the rear of the deque ---
Astronaut added to the rear of the deque: Valentina Tereshkova

Size of deque: 4
Frontmost element of deque: Buzz Aldrin
Rearmost element of deque: Valentina Tereshkova

Contents of deque:
Buzz Aldrin
Chris Hadfield
Neil Armstrong
Valentina Tereshkova

-----
```

- New Deque called "astronauts" created

- enqueueFront() called to add a new name to the front of deque
- size() called to return deque size
- first() and last() called to return frontmost and backmost names
- toString() called to print all names in deque

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- size() called to return deque size
- first() and last() called to return frontmost and backmost names
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- enqueueFront() called to add a new name to the front of deque
- size() called to return deque size
- first() and last() called to return frontmost and backmost names
- toString() called to print all names in deque

- enqueueRear() called to add a new name to the rear of deque
- size() called to return deque size
- first() and last() called to return frontmost and backmost names
- toString() called to print all names in deque

```

--- Astronaut name add attempt to the rear of the deque ---
Astronaut added to the rear of the deque: Yuri Gagarin

Size of deque: 5
Frontmost element of deque: Buzz Aldrin
Rearmost element of deque: Yuri Gagarin

Contents of deque:
Buzz Aldrin
Chris Hadfield
Neil Armstrong
Valentina Tereshkova
Yuri Gagarin

-----

--- Astronaut name add attempt to the front of the deque ---
Karan Bharaj cannot be added to the front of this deque
This deque is full. Dequeue an element and try queuing again

-----

--- Astronaut name add attempt to the rear of the deque ---
Karan Bharaj cannot be added to the rear of this deque
This deque is full. Dequeue an element and try queuing again

-----

--- Astronaut removal attempt from the rear of the deque ---
Astronaut removed from the rear of the deque: Yuri Gagarin

Size of deque: 4
Frontmost element of deque: Buzz Aldrin
Rearmost element of deque: Valentina Tereshkova

Contents of deque:
Buzz Aldrin
Chris Hadfield
Neil Armstrong
Valentina Tereshkova

-----

--- Astronaut removal attempt from the front of the deque ---
Astronaut removed from the front of the deque: Buzz Aldrin

Size of deque: 3
Frontmost element of deque: Chris Hadfield
Rearmost element of deque: Valentina Tereshkova

Contents of deque:
Chris Hadfield
Neil Armstrong
Valentina Tereshkova

-----

```

- enqueueRear() called to add a new name to the rear of deque
- size() called to return deque size
- first() and last() called to return frontmost and backmost names
- toString() called to print all names in deque

- enqueueFront() called to add a new name to the front of deque
- Deque is full, so user is notified accordingly

- enqueueRear() called to add a new name to the rear of deque
- Deque is full, so user is notified accordingly

- dequeueRear() called to remove a name from the rear of the deque
- size() called to return deque size
- first() and last() called to return frontmost and backmost names
- toString() called to print all names in deque

- dequeueFront() called to remove a name from the front of the deque
- size() called to return deque size
- first() and last() called to return frontmost and backmost names
- toString() called to print all names in deque

```

--- Astronaut removal attempt from the front of the deque ---
Astronaut removed from the front of the deque: Chris Hadfield

Size of deque: 2
Frontmost element of deque: Neil Armstrong
Rearmost element of deque: Valentina Tereshkova

Contents of deque:
Neil Armstrong
Valentina Tereshkova

-----

--- Astronaut removal attempt from the rear of the deque ---
Astronaut removed from the rear of the deque: Valentina Tereshkova

Size of deque: 1
Frontmost element of deque: Neil Armstrong
Rearmost element of deque: Neil Armstrong

Contents of deque:
Neil Armstrong

-----

--- Astronaut removal attempt from the front of the deque ---
Astronaut removed from the front of the deque: Neil Armstrong
This Deque is Empty. Try adding an element before dequeuing

-----

--- Astronaut removal attempt from the rear of the deque ---
This Deque is empty. Try adding an element before dequeuing

-----

--- Astronaut removal attempt from the front of the deque ---
This Deque is empty. Try adding an element before dequeuing
-----

```

- `dequeueRear()` called to remove a name from the rear of the deque
 - `size()` called to return deque size
 - `first()` and `last()` called to return frontmost and backmost names
 - `toString()` called to print all names in deque
-
- `dequeueRear()` called to remove a name from the rear of the deque
 - `size()` called to return deque size
 - `first()` and `last()` called to return frontmost and backmost names
 - `toString()` called to print all names in deque
-
- `dequeueFront()` called to add a new name to the front of deque
 - User notified that the deque is empty
-
- `dequeueRear()` called to add a new name to the rear of deque
 - User notified that the deque is empty
-
- `dequeueFront()` called to add a new name to the front of deque
 - User notified that the deque is empty