Gebze Technical University
Department of Computer Engineering
CSE 241/505
Object Oriented Programming
Fall 2017
Homework # 7
Java Inheritance and Generics
Due date
Dec 28th 2017

In this homework, you will write a generic class hierarchy for sets and maps for Java.

GTUSetInt<T> is a Java interface with the following methods.

empty	
	Test whether container is empty
size	
	Return container size
max_size	
	Return maximum size
insert	
	Insert element, throws exception InvalidParameterException if the element is already in the set
intersection	

The returned set is the intersection of this set and the given set.

erase	
	Erase element
clear	
	Clear all content
find	
	Get iterator to element
count	
	Count elements with a specific value
begin	
	Return iterator to beginning
end	
	Return iterator to end

The class GTUSet<T> implements the GTUSetInt interface. It will keep its data using Java arrays. Do not use any Java Collection classes. It implements the intersection method as follows:

intersection

```
GTUSetInt<T> intersection(GTUSetInt<T>)
```

The returned set is the intersection of this set and the given set.

The class GTUMap<K, V> extends from GTUSet< **javafx.util.Pair** <K, V> > and implements the following extra method

at

Access element

```
V at(K k)
```

If *k* matches the key of an element in the set, the method returns a reference to its mapped value.

The class GTUIterator implements the following methods

`boolean`	**`hasNext`**`()` Returns `true` if this list iterator has more elements when traversing the list in the forward direction.
`boolean`	**`hasPrevious`**`()` Returns `true` if this list iterator has more elements when traversing the list in the reverse direction.
`T`	**`next`**`()` Returns the next element in the list and advances the cursor position.
`T`	**`previous`**`()` Returns the previous element in the list and moves the cursor position backwards.

Write your driver class to test the all the classes and all of their methods.

Notes

- Submit your nicely produced Javadoc documents with your homework.
- Do not forget to test the thrown exceptions