Homework 7

source code: (with Heap.java inside package com)

```
// Homework7.java

package com;

import java.util.Comparator;

public class Homework7 {

	public static <E> void outputSorted(Person[] arr, Comparator<? super Person>
comparator) {

		// create a heap
		Heap<Person> heap = new Heap<Person>(comparator);

		// insert data into heap
		for(int i = 0; i < arr.length; i++) {
			heap.insert(arr[i]);
		}

		// print the sorted array
		while(!heap.isEmpty()) {
			System.out.print(heap.extract().name);
			System.out.print(" ");
		}

		System.out.println();
	}

	public static void main(String[] args) {

		// Create test cases
		Person[] persons = {
				new Person("David", 35, 170),
				new Person("Amelia", 20, 197),
				new Person("Olivia", 80, 154),
				new Person("Elwood", 66, 187),
				new Person("Bruce", 17, 198),
				new Person("Simon", 45, 179),

		};

		// test the results
		outputSorted(persons, new CompareByName());
		outputSorted(persons, new CompareByAge());
		outputSorted(persons, new CompareByHeight());
	}
```

```java
// Person.java

package com;

public class Person {
	String name;
	int age;
	double height;

	public Person(String name, int age, int height) {
		this.name = name;
		this.age = age;
		this.height = height;
	}
}
```

```java
// CompareByName.java

package com;

import java.util.Comparator;

public class CompareByName implements Comparator<Person>{
	public int compare(Person p1, Person p2) {
		return -p1.name.compareTo(p2.name);
	}
}
```

```java
// CompareByAge.java

package com;

import java.util.Comparator;

public class CompareByAge implements Comparator<Person>{
	public int compare(Person p1, Person p2) {
		if(p1.age > p2.age) {
			return 1;
		}
		if(p1.age < p2.age) {
			return -1;
		}
		return 0;
	}
}
```

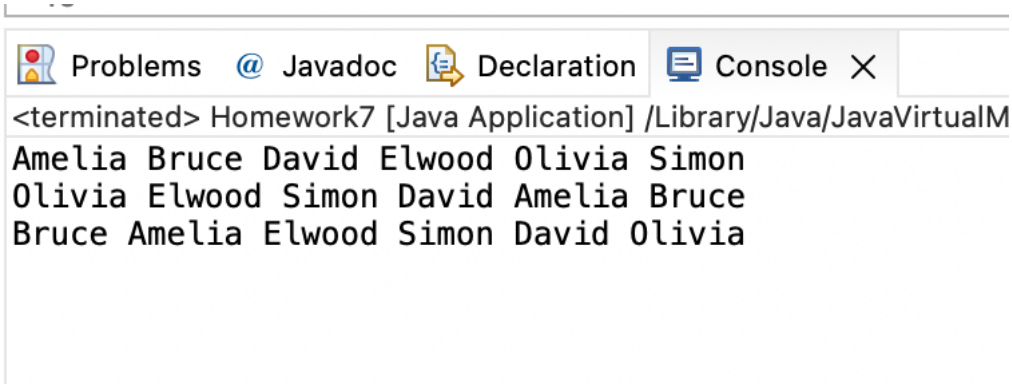
```java
// CompareByHeight.java

package com;

import java.util.Comparator;

public class CompareByHeight implements Comparator<Person>{
	public int compare(Person p1, Person p2) {
		if(p1.height > p2.height) {
			return 1;
		}
		if(p1.height < p2.height) {
			return -1;
		}
		return 0;
	}
}
```

Output:



By Name:

Amelia Bruce David Elwood Olivia Simon

By Age:

Olivia Elwood Simon David Amelia Bruce

By Height:

Bruce Amelia Elwood Simon David Olivia