W2D1 Homework

1 What’s character of these Collection, Collections, List, Set and Map? ArrayList and LinkedList? HashMap and TreeMap?

**Answer:**

**Collection, Collections, List, Set and Map**

**Collection** is a Java Interface.

**Collections-** represent a group of objects, known as its elements.

**List** provides ordered and indexed collection which may contain duplicates.

**Set** provides an un-ordered collection of unique objects. Set doesn't allow duplicates.

**Map**provides a data structure based on key value pair and hashing.

**ArrayList and LinkedList**

**ArrayList** is an array having a collection of items. That can implements all optional list operations and permits of all elements including null value.

**LinkedList** is a linear collection data element that used to implement several other common [abstract data types](https://en.wikipedia.org/wiki/Abstract_data_type), including [lists](https://en.wikipedia.org/wiki/List_(abstract_data_type)) (the abstract data type), [stacks](https://en.wikipedia.org/wiki/Stack_(abstract_data_type)), [queues](https://en.wikipedia.org/wiki/Queue_(abstract_data_type)), [associative arrays](https://en.wikipedia.org/wiki/Associative_array), and [S-expressions](https://en.wikipedia.org/wiki/S-expression).

**HashMap and TreeMap**

**HashMap** is an implementation of Map Interface, which maps a key to value.Duplicate keys are not allowed in a map.

**TreeMap** maintains order of the objects.

2. （List）Read the codes

**import java.util.\*;**

**public class Test {**

**public static void main(String args[]) {**

**List list = new ArrayList();**

**list.add("Hello");**

**list.add("World");**

**list.add(1, "Learn");**

**list.add(1, "Java");**

**printList(list);**

**}**

**public static void printList(List list) {**

**// 1**

**for (int i = 0; i < list.size(); i++) {**

**System.out.println(list.get(i));**

**}**

**for (Object o : list) {**

**System.out.println(o);**

**}**

**Iterator itor = list.iterator();**

**while (itor.hasNext()) {**

**System.out.println(itor.next());**

**}**

**}**

**}**

Requirement:

1. Write the output of the code.

Hello

Java

Learn

World

Hello

Java

Learn

World

Hello

Java

Learn

World

1. Where and how to modify if change Arraylist with LinkedList? What’s the difference between ArrayList and LinkedList?

Answer:

List list = **new** ArrayList(); change to List list = **new** LinkedList();

1. Where and how to modify if change Arraylist with Vector? What’s the difference between ArrayList and Vector?

Answer:

List list = **new** ArrayList();change List list = **new** Vector();

ArratList is not synchronized while Vector is synchronized.

3. （List）Write the output of the program.

**import** java.util.\*;

**public** **class** TestList {

**public** **static** **void** main(String args[]) {

List list = **new** ArrayList();

list.add("Hello");

list.add("World");

list.add("Hello");

list.add("Learn");

list.remove("Hello");

list.remove(0);

**for**(**int** i = 0; i < list.size(); i++) {

System.***out***.println(list.get(i));

}

}

}

**Answer:**

Hello

Learn

4. Select the right one?

**import** java.util.\*;

**public** **class** TestListSet {

**public** **static** **void** main(String args[]) {

List list = **new** ArrayList();

list.add("Hello");

list.add("Learn");

list.add("Hello");

list.add("Welcome");

Set set = **new** HashSet();

set.addAll(list);

System.***out***.println(set.size());

}

}

1. Compile with error
2. Compile correctly, but throw exception when running.
3. Compile and run well, and output 3
4. Compile and run well, and output 4

5 (List, Map)

**Answer:**

3. Compile and run well, and output 3

**public** **class** Worker {

**private** **int** age;

**private** String name;

**private** **double** salary;

**public** Worker() {

}

**public** Worker (String name, **int** age, **double** salary) {

**this**.name = name;

**this**.age = age;

**this**.salary = salary;

}

**public** **int** getAge() {

**return** age;

}

**public** **void** setAge(**int** age) {

**this**.age = age;

}

**public** String getName() {

**return** name;

}

**public** **void** setName(String name) {

**this**.name = name;

}

**public** **double** getSalary() {

**return** salary;

}

**public** **void** setSalary(**double** salary) {

**this**.salary = salary;

}

**public** **void** work() {

System.***out***.println(name + "is working");

}

}

Please finish the requirement:

1. To create a List and add three workers, and their information shown like this:

|  |  |  |
| --- | --- | --- |
| Name | Age | Salary |
| Simon | 20 | 10000 |
| Jame | 25 | 13000 |
| Alex | 22 | 12000 |

1. Add one worker before Jame ( Steven, 24, 15000)
2. Remove the worker Alex’s information
3. Go through the list using for statement and print out all the worker’s information.
4. Go through the list using Iterator statement to call all the worker’s method work.
5. Over write the equals method for the class Worker. New equals method return true only if the workers’ name, age and salary are the same at the same time.
6. **Sort the all the workers from high to low by salary** and print out the all the workers information with the format “Name: “ + name + “ Salary: “ + salary.
7. Add a id to Worker class, and save the above data to workMap. Map<String, Worker > ( Worker ID, Worker) . **At least three ways t**o go through the workMap, to print out all the workder’s information with Worker id and all other information like “Worker Id: “ + “Name: “ + name + “Age: “ + age + “ Salary: “ + salary.