W2D1 Homework

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

**Collection**

**- Collection is an object that groups multiple elements and is used to store, retrieve, and manipulate data**

**List**

**- List is a kind of collection used in storing an ordered sequence of elements(similar to arrays)**

**Set**

**- Set is a kind of collection used in storing unique elements in no particular ordered**

**Map**

**- Map is a kind of collection used in storing element values with corresponding keys where keys are unique**

**ArrayList and LinkedList**

**- ArrayLists are better to use when retrieve data. LinkedLists are better to use for manipulating data such as adding or deleting. Technically they have the same functions. Only difference is their performance. It is faster for LinkedLists to manipulate data because it does not consume as much memory as an ArrayList**

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. Complete the codes at //1, and need to print out all the elements of the list.
2. Write the output of the code.

2.png

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

**You can modify it as List list = new LinkedList();**

**\*\*see Test.java\*\***

**Arraylists consumes more memory than Linkedlists. Also, it is better to use Arraylists for retrieving data and Linkedlists for manipulating data due to the memory consumption of each list.**

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

**You can modify it to List list = new LinkedList(); here:**

**\*\*see Test.java\*\***

**Vectors are synchronized while ArrayLists are not.**

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

**Answer: 3. Compile and run well, and output 3**

5 (List, Map)

**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.