Map and Generics

Assignment Questions

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1. **What is a Map in Java?**

   Ans :

- **The Map is the interface which is present in the java for storing the key and value in the single unit.**
- **There is the Hierarchy of the Map which consists of different classes & interfaces.**
- **The Map is used to store the value with the specific key which should be unique.**

2. **What are the commonly used implementations of Map in Java?**

   Ans :

- **The Commonly used implementations of the Map are the HashMap, LinkedHashMap and TreeMap.**
- **These are the classes present inside the Hierarchy of the Map interface which are used to store the data in the form of the key and the value.**

3. **What is the difference between HashMap and TreeMap?**

   Ans :

HashMap	TreeMap
1. It is the class present in the Map Hierarchy. 2. The HashMap implements the Map interface. 3. The HashMap is used to store the data in the form of key and value. 4. The HashMap does not preserve the order of insertion at the time of	1. It is the class which is also present in the Map Hierarchy. 2. The TreeMap implements the navigable interface. 3. The TreeMap is also used to store the data in key value pair. 4. The TreeMap is used to sort the key and value pair in ascending order.

printing.

5. Example :-

```
import java.util.*;
public class HashMapClass{
    public static void main
(String[]args){
        HashMap hm = new
HashMap();
        hm.put (1, "varshab");
        hm.put (2, "chandel");
        hm.put(3, "java");
        hm.put(4,"om");

        System.out.println(hm);
    }
}
```

Output :-

{1=varshab, 2=chandel, 3=java, 4=om}

5. Example :-

```
import java.util.*;
public class TreeMapConcept{
    public static void main
(String[]args){
        TreeMap tm = new
TreeMap();
        tm.put (1,"varshab");
        tm.put (3,"java");
        tm.put (2,"chandel");
        tm.put(4,"om");

        System.out.println
(tm);
    }
}
```

Output :-

{1=varshab, 2=chandel, 3=java, 4=om}

4. How do you check if a key exists in a Map in Java?

Ans :

- We can check by the key name we can find the key is referring to any value if it rafters any value then the key exists.
- The key must be unique for one value.

5. What are Generics in Java?

- The Generics is used to define the working type for the classes present in the collection or any other class.
- The Generics is already defined as the type of the data which the object of the class will work with.
- The Generics is used to achieve type safety.
- The type is defined inside the angular brackets< > in the Generics

- **The Example of the generics is given below :-**

```
import java.util.*;
public class GenericsConcept {
    public static void main (String[]args){
        ArrayList<String> al = new ArrayList<String>();
        al.add("varshab");
        al.add("chandel");
        al.add("java");
        al.add("om");

        System.out.println (al);
    }
}
```

Output :-

[varshab, chandel, java, om]

6. What are the benefits of using Generics in Java?

Ans :

- **The Generics is beneficial to achieve type safety in the classes of collection or any class.**
- **By the help of Generics we don't get the runtime error due to the type of the data.**
- **By this we can get to know about the type mistake in compile time.**
- **It is beneficial at the time of fetching the data. We don't need to downcast the object at the time of calling.**

7. What is a Generic Class in Java?

Ans :

- **The Generics class is used to achieve the type safety at the class.**
- **We can built the class with the <T> type and we can give the type at the time of object creation with the help of the concept of Generics.**
- **The Example of Generics class :-**

```
import java.util.*;
class Demo<T>{
    T obj;
    public Demo(T obj){
        this.obj = obj;
```

```
        }
        public void disp(){
            System.out.println ("The type of the class is : " +
obj.getClass().getName());
        }
        public T getObj() {
            return obj;
        }
    }
    public class GenericsInJava {
        public static void main (String[]args){
            Demo<String> d = new Demo<String>("varshab");
            d.disp();
            System.out.println(d.getObj());
        }
    }
```

Output :-

```
    The type of the class is : java.lang.String
    varshab
```

8. What is a Type Parameter in Java Generics?

Ans :

- **The type parameter in java is denoted by <T> which gives the temporary type to the Generics class.**
- **We can give the temporary type T as the string or any other type of data at the time of object creation.**

9. What is a Generic Method in Java?

Ans :

- **The Generics method is used to get the object which has the type parameter T.**
- **The Generics method returns the object with the return type of parameter T.**
- **The type T is defined at the time of object creation.**

10. What is the difference between ArrayList and ArrayList<T>?

Ans :

- **The ArrayList is accepting all the types of data to store in the form of ArrayList.**
- **The ArrayList<T> will store only the type of data which it provides to work with like <String> then it works with only the string type of data.**