**Java Generics Assignments**

1.

**Employee.java**package com.GenericsAssignment;  
  
public class Employee {  
 private long id;  
 private String name, department;  
 private double salary;  
  
 public Employee(long id, String name, String department, double salary) {  
 this.id = id;  
 this.name = name;  
 this.department = department;  
 this.salary = salary;  
 }  
  
 public void displayDetails()  
 {  
 System.*out*.println("Emp\_id : " + id);  
 System.*out*.println("Name " + name);  
 System.*out*.println("Salary " + salary);  
 System.*out*.println("Department " + department);  
 }  
  
}

**GenericHashSet.java**package com.GenericsAssignment;  
import java.util.HashSet;  
  
public class GenericHashSet <T extends Employee> {  
 private HashSet<T> employeeHashSet = new HashSet<>();  
 public void setEmployeeHashSet(T e)  
 {  
 employeeHashSet.add(e);  
 System.*out*.println("New Employee is Added! ");  
 }  
 public void getEmployeeDetails()  
 {  
 if(employeeHashSet.isEmpty())  
 {  
 System.*out*.println("Employees Not Found");  
 }  
 else {  
 for (T itr : employeeHashSet) {  
 System.*out*.println("------------------------");  
 itr.displayDetails();  
 }}}}

**Main.java**

package com.GenericsAssignment;  
import java.util.Scanner;  
public class Main {  
 public static void main(String[] args) {  
 GenericHashSet<Employee> employeeGenericHashSet = new GenericHashSet<>();  
 Scanner input = new Scanner(System.*in*);  
 int choice;  
 do{  
 Menus.*displayMenu*();  
 choice = input.nextInt();  
 switch (choice) {  
 case 1 -> {  
 Menus newEmployee = new Menus();  
 employeeGenericHashSet.setEmployeeHashSet(newEmployee.addEmployee());  
 }  
 case 2 -> {  
 System.*out*.print("Employees List: ");  
 employeeGenericHashSet.getEmployeeDetails();  
 }  
 case 3 -> System.*out*.println("Bye");  
 default -> System.*out*.println("Invalid input");  
 }  
 }while(choice != 3);  
 }  
}

**Menus.java**

package com.GenericsAssignment;  
import java.util.Scanner;  
public class Menus {  
  
 Employee newEmployee;  
 Scanner input = new Scanner(System.*in*);  
 long id;  
 String name, department;  
 double salary;  
 public static void displayMenu()  
 {  
 System.*out*.println("\nChoose an option");  
 System.*out*.println("1. Enter a new Employee Details");  
 System.*out*.println("2. View all Employees");  
 System.*out*.println("3. Exit");  
 System.*out*.print("Enter your choice: ");  
 }  
 public Employee addEmployee()  
 {  
 System.*out*.print("\nEnter Details of Employee");  
 System.*out*.print("\nEnter Employee Id : ");  
 id = input.nextLong();  
 System.*out*.print("Enter Name : ");  
 name = input.next();  
 System.*out*.print("Enter Salary : ");  
 salary = input.nextDouble();  
 System.*out*.print("Enter Department : ");  
 department = input.next();  
 newEmployee = new Employee(id,name,department,salary);  
 return newEmployee;  
 }  
  
}

2.

**GenericKeyValue.java**package HashMapKeyValue;  
  
import java.util.HashMap;  
  
public class GenericKeyValue <T1 extends Integer , T2 extends Double> {  
 HashMap<T1,T2> keyValuePair = new HashMap<>();  
  
 public void setKeyValuePair(T1 key,T2 value) {  
 System.*out*.println("Added pair:- "+ "(" + key + "," + value + ")" );  
 keyValuePair.put(key,value);  
 }  
}

**Main.java**package HashMapKeyValue;  
  
public class Main {  
 public static void main(String[] args) {  
 GenericKeyValue keyValuePair = new GenericKeyValue();  
  
 keyValuePair.setKeyValuePair(1,68.12);  
 keyValuePair.setKeyValuePair(9,23.42);  
 keyValuePair.setKeyValuePair(8,66.98);  
 keyValuePair.setKeyValuePair(3,56.09);  
 keyValuePair.setKeyValuePair(4,132.0);  
 keyValuePair.setKeyValuePair(2,15.03);  
 keyValuePair.setKeyValuePair(17,12.76);  
 keyValuePair.setKeyValuePair(63,128.15);  
 keyValuePair.setKeyValuePair(102,69.78);  
 keyValuePair.setKeyValuePair(28,6.0);  
 }  
}

3.

**Main.java**

package ExchangeElementsPositions;  
import java.util.Arrays;  
  
public class Main {  
 public static void main(String[] args) {  
 Integer[] arr = {12 ,15,11, 3,16,2,4,8,0};  
 *exchangePositions*(arr,2,arr.length-1);  
  
 String[] str = {"how" , "Hello", "are" , "you" };  
 *exchangePositions*(str, 1, 0 );  
  
 }  
 public static <T> void exchangePositions(T[] arr, int idx1 , int idx2)  
 {  
 System.*out*.println("Before Exchange : " + Arrays.*toString*(arr));  
 T temp = arr[idx1];  
 arr[idx1] = arr[idx2];  
 arr[idx2] = temp;  
 System.*out*.println("After Exchange : " + Arrays.*toString*(arr));  
 }  
}

4.

**Main.java**

package StringAndDatePair;  
import java.util.Date;  
public class Main {  
 public static void main(String[] args) {  
  
 try {  
 Pair<String> obj1 = new Pair<>();  
 obj1.setKey("1");  
 obj1.setValue("Hello");  
 System.*out*.println("key: " + obj1.getKey()+ " , Value: " + obj1.getValue());  
  
 Pair<Date> obj2 = new Pair<>();  
 obj2.setKey("hello");  
 obj2.setValue(new java.util.Date());  
 System.*out*.println("Key: " + obj2.getKey()+ " , Value: " + obj2.getValue());  
   
 }  
 catch(Exception e)  
 {  
 System.*out*.println(e.getMessage());  
 }  
 }  
}

**Pair.java**  
package StringAndDatePair;  
  
import com.sun.jdi.InvalidTypeException;  
  
import java.util.Date;  
  
public class Pair <T extends Comparable<T>>{  
 String key;  
 T value;  
  
 public String getKey() {  
 return key;  
 }  
  
 public void setKey(String key) {  
 this.key = key;  
 }  
  
 public T getValue() {  
 return value;  
 }  
  
 public void setValue(T value) throws Exception {  
 if(value.getClass() == String.class || value.getClass() == java.util.Date.class)  
 {  
 this.value = value;  
 }  
 else{  
 throw new InvalidTypeException("Only accept String or Date");  
 }  
 }  
}