IT23024

1. Demonstrate how a child class can access a protected member of its parent class within the same package. Explain with example what happens when the child class is in a different package

Answer: In Java a protected member is variable, method or constructor. And these member can be accessed by-

i) within same package any class can access protected member

ii) In different package only subclass can access protected members, and only through inheritance.

Lets look at both the scenarios →

Case1: child class in same package

File: Parent.java

```
package mypackage;
public class Parent {
    protected String message = "Hellow from parent";
```

IT23024

File: child.java

```
package mypackage;
public void showMessage() {
    system.out.printIn(message);
}
public static void main(String[] args){
    child c = new chid();
    e.show message();
}
}
```

Output:

Hello from parent

case2: child class in a diffenent package

File: parent.java

```
package mypackage;
public class parent{
    protected string msg = "Hellow I am Mim
}
```

File: Child.java [In another package]

```
package child package;
import mypackage.Parent;
public class child extends Parent {
    public void message(){
        System.out.println(msg);
    }
public static void main(String[] args){
    child c = new child();
    c.message();
}
}
```

Output:

Hellow I am mini.

So, from the example it is seen that protected member can be accessed both from the same package subclasses and from different package's subclasses.

IT23024

4. Write Program to -

i) Find the kth smallest element in an ArrayList

ii) Create a TreeMap to store the Mappings of words to their frequency in a given text.

iii) Implement a Queue and stack using the priority Queue class with custom comparator

iv) Create a TreeMap to store the mappings of student IDs to their departments

Answer:

Array list of kth element

```
import java.util.*;
public class KthSmallest {
    public static void main(String[] args) {
    ArrayList<Integer> list = new ArrayList<>();
    List.add(7);
    list.add(2);
    list.add(9);
    list.add(1);
    int k=3;
```