



SOMAIYA
VIDYAVIHAR UNIVERSITY

K J Somaiya College of Engineering

K. J. Somaiya College of Engineering, Mumbai-77

(A Constituent College of Somaiya Vidyavihar University)



Department of Computer Engineering

Batch No. _B2_ Roll No. _110_

Experiment / Assignment/ Tutorial No. 2

Grade : AA/AB/BB/BC/CC/CD/DD

Signature of the Staff In-charge with date

TITLE : Java Packages

Create a **Package Engineering** which has two classes as **Student and Marks**. Accept (n) student detail like roll_no, Subject_name, Student_name, calculate total marks in the class Student Write **display () method** to display details and **sort () method** to sort the students records as per increasing order of the total marks. The function **sort must be statically defined to invoke it without referring any object**. Both the functions write in the Marks class.

Create a main class which will use package display all the records of the student in the increasing order of the their total marks.

Expected OUTCOME of Experiment:

CO4: Explore the interface, exceptions, multithreading, packages.

Books/ Journals/ Websites referred:



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1. Ralph Bravaco , Shai Simoson , “Java Programing From the Group Up” Tata McGraw-Hill.
2. Grady Booch, Object Oriented Analysis and Design .

Pre Lab/ Prior Concepts:

Java Packages:

A package in Java is a group of similar types of classes, interfaces, and sub-packages. They can be categorized into two categories, the built-in package (java, lang, util, awt, javax, swing, net, io, sql et), and user-defined package.

They are used for the following tasks –

- To prevent the naming conflicts which can occur between the classes.
- Make the searching and locating of classes or enumerations or annotations much easier.
- Provide access control to the classes.
- Used for data encapsulation.

Advantages of Java Package:

- A Java package is mainly used for the categorization of classes and interfaces so that we can maintain them easily.
- They always provide access protection
- Used to bundle classes and interface.
- With the help of packages, we can reuse the existing code
- By using package, we can easily locate the classes related to it.
- Also, remove the naming collision.

Built-in Packages in Java

Built-in is a part of Java API and it offers a variety of packages are –

lang – Automatically imported and it contains language support classes.

io – Contains classes for input and output operations.

util – Contains utility classes for implementing data structures.

applet – This package contains classes that create applets.

awt – Contain classes that implement compounds for GUI.

net – This package contains classes that support networking operations.



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User-defined Packages in Java

```
1. package First;
2.
3. public class MyClass
4. {
5.     public void getNames(String name)
6.     {
7.         System.out.println(name);
8.     }
9.
10. }
```

```
1. package First;
2. import First.MyClass;
3. public class MyClass1 {
4.     public static void main(String args[])
5.     {
6.         // Initializing the String variable with a value
7.         String name = "Welcome";
8.         // Creating an instance of class MyClass in the package.
9.         MyClass obj = new MyClass();
10.     obj.getNames(name);
11. }
12. }
```

Class Diagram:

Class Marks contains the sort method.

Class student Contains int marks, String name and int id. All fields



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Are public. Class student implements comparable and overrides compareTo method.
These classes are in separate folder Engineering. Both classes are in package Engineering.

Implementation details:

/******

Create a Package Engineering which has two classes as Student and Marks. Accept (n) student detail like roll_no, Subject_name, Student_name, calculate total marks in the class Student. Write display () method to display details and sort () method to sort the students records as per increasing order of the total marks. The function sort must be statically defined to invoke it without referring any object. Both the functions write in the Marks class.

*****/

```
import Engineering.Student;
```

```
import Engineering.Marks;
```

```
public class Main
```

```
{
```

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

```
        System.out.println("Hello World");
```

```
        Student A= new Student();
```

```
        A.marks=20;
```



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```
A.display();  
  
Student B= new Student();  
  
B.marks=210;  
  
Student C= new Student();  
  
C.marks=10;  
  
Student listofstudents[]=new Student[3];  
  
listofstudents[0]=A;  
  
listofstudents[1]=B;  
  
listofstudents[2]=C;  
  
System.out.println("Before Sorting");  
  
System.out.println(listofstudents[0].marks);  
  
System.out.println(listofstudents[1].marks);  
  
System.out.println(listofstudents[2].marks);  
  
Marks.sort(listofstudents);  
  
System.out.println("After Sorting");  
  
System.out.println(listofstudents[0].marks);  
  
System.out.println(listofstudents[1].marks);  
  
System.out.println(listofstudents[2].marks);  
  
}
```



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}

```
package Engineering;

import java.util.Arrays;

public class Student implements Comparable{

    public int rollno;

    public String name;

    public int marks;

    public void display(){

        System.out.println(rollno);

        System.out.println(name);

        System.out.println(marks);

    }

    public int compareTo(Object A){

        Student B=(Student)A;

        if(B.marks==this.marks){

            return 0;

        }

    }

}
```



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```
        if(B.marks<this.marks){  
            return 1;  
        }  
        return -1;  
    }  
}
```

```
package Engineering;  
  
import java.util.Arrays;  
  
public class Marks{
```

```
    public static void sort(Student [] listofstudents){  
        Arrays.sort(listofstudents);  
    }  
}
```



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Output:

Hello World

0

null

20

Before Sorting

20

210

10

After Sorting

10

20

210

Conclusion:

Thus we have understood what packages are in Java. We implemented packages in Java. Using packages, we can organise code into logical divisions. By logically dividing the code segments and importing only what is required we make the program easier to debug.



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Date: 23 nov 22

Signature of faculty in-charge

Post Lab Descriptive Questions

Q.1 What are Java Packages? What's the significance of packages?

A package in Java is used to group related classes. Package in Java is a mechanism to encapsulate a group of classes, sub packages and interfaces. Packages are used for: **Preventing naming conflicts**. For example there can be two classes with name Employee in two packages, college

Q.2 Does Importing a package imports its sub-packages as well in Java?

No