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Java Assignment 6(Packages)

Write a program to perform 4 basic operations

1) Each operation should be a part of each class inside the package.

2) Main class should import all the packages and perform operations

Theory:

1) A **java package** is a group of similar types of classes, interfaces and sub-packages. Package in java can be categorized in two form, built-in package and user-defined package.
2) There are many built-in packages such as java, lang, awt, javax, swing, net, io, util, sql etc.

How packages work?

Package names and directory structure are closely related. For example if a package name is college.staff.cse, then there are three directories, college, staff and cse such that cse is present in staff and staff is present college. Also, the directory college is accessible through CLASSPATH variable, i.e., path of parent directory of college is present in CLASSPATH. The idea is to make sure that classes are easy to locate.

3) The **package keyword** is used to create a package in java.

For example, **package** mypack; **public class**

```
Simple{ public static void main(String
args[]){
        System.out.println("Welcome to package");
        }
}
```

Built-in Packages: These packages consist of a large number of classes which are a part of Java API.Some of the commonly used built-in packages are:

1) java.lang: Contains language support classes(e.g classed which defines primitive data types, math operations). This package is automatically imported.
2) java.io: Contains classed for supporting input / output operations.
3) java.util: Contains utility classes which implement data structures like Linked List, Dictionary and support ; for Date / Time operations.
4) java.applet: Contains classes for creating Applets.
5) java.awt: Contain classes for implementing the components for graphical user interfaces (like button , ;menus etc).
6) java.net: Contain classes for supporting networking operations.

User-defined packages: These are the packages that are defined by the user. First we create a directory myPackage (name should be same as the name of the package). Then

create the MyClass inside the directory with the first statement being the package names.

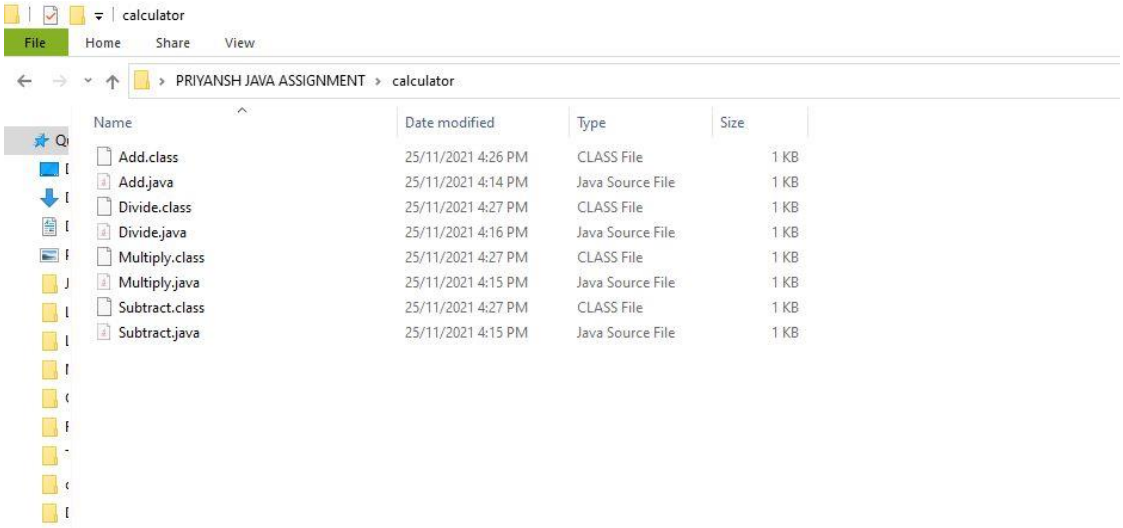
Advantage of Java Package:

1) Java package is used to categorize the classes and interfaces so that they can be easily maintained.

2) Java package provides access protection.

4) Java package removes naming collision.

Package overview for the program:



Code for Add class in the package:

```
package calculator;
public class Add {

   public int add(int a, int b) {
      return a+b;
   }

}
```

Code for Subtract class in the package:

```
package calculator;
public class Subtract {

   public int subtract(int a, int b) {
      return a-b;
   }
```

```
}
```

Code for Multiply class in the package:

```
package calculator;
public class Multiply {

   public int multiply(int a, int b) {
      return a*b;
   }

}
```

Code for Divide class in the package:

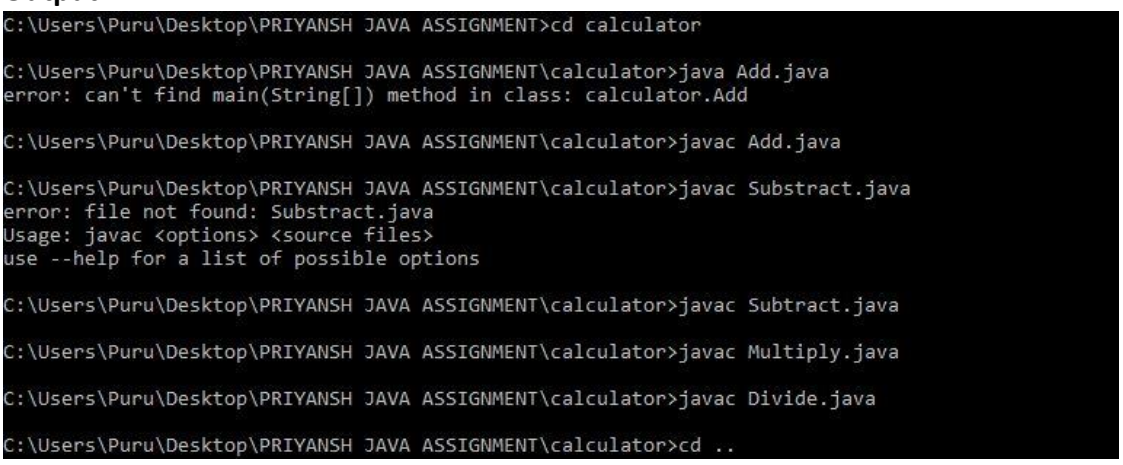
```
package calculator;
public class Divide {

   public int divide(int a, int b) {
      return a/b;
   }

}
```

Main program code:

```
import calculator.*;
import java.util.Scanner;



public class Main {

   public static void main(String[] args) {
      double a,b;
      Scanner in = new Scanner(System.in);
      System.out.println("Welcome to the calculator\n");

      while(true) {
         System.out.println("\n1.Add\n2.Subtract\n3.Multiply\n4.Divide\n5.Exit");
         System.out.println("Which operation would you like to perform?"); int n
         = in.nextInt(); if(n==5) {
            System.out.println("\nShutting down...");
            System.exit(0);
```

```
        }
        System.out.println("Enter two numbers");
        a = in.nextDouble(); b = in.nextDouble();
        switch (n) {
          case 1:
            Add ad = new Add();
            System.out.println("The addition is " + ad.add(a,b) + "\n\n");
            break;
          case 2:
            Subtract sub = new Subtract();
            System.out.println("The subtraction is " + sub.subtract(a,b) + "\n\n");
            break;
          case 3:
            Multiply mult = new Multiply();
            System.out.println("The multiplication is " + mult.multiply(a,b) + "\n\n");
            break;
          case 4:
            Divide div = new Divide();
            System.out.println("The division is " + div.divide(a,b) + "\n\n");
            break;
          default:
            System.out.println("Invalid input");
            break;
        }
      }

   }
}
```

Output:



```
C:\Users\Puru\Desktop\PRIYANSH JAVA ASSIGNMENT>javac Main.java

C:\Users\Puru\Desktop\PRIYANSH JAVA ASSIGNMENT>java Main
Welcome to the calculator


1.Add
2.Subtract
3.Multiply
4.Divide
5.Exit
Which operation would you like to perform?
1
Enter two numbers
3
6
The addition is 9



1.Add
2.Subtract
3.Multiply
4.Divide
5.Exit
Which operation would you like to perform?
4
Enter two numbers
8
2
The division is 4
```

```
1.Add
2.Subtract
3.Multiply
4.Divide
5.Exit
Which operation would you like to perform?
2
Enter two numbers
9
4
The subtraction is 5



1.Add
2.Subtract
3.Multiply
4.Divide
5.Exit
Which operation would you like to perform?
4
Enter two numbers
6
3
The division is 2



1.Add
2.Subtract
3.Multiply
4.Divide
5.Exit
Which operation would you like to perform?
3
Enter two numbers
7
8
The multiplication is 56
```

```
1.Add
2.Subtract
3.Multiply
4.Divide
5.Exit
Which operation would you like to perform?
3
Enter two numbers
7
8
The multiplication is 56



1.Add
2.Subtract
3.Multiply
4.Divide
5.Exit
Which operation would you like to perform?
```