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# PACKAGE



# JAVA API Packages – Classes & Interfaces

- `java.applet` – for web browser
- `java.awt` – Abstract Window Toolkit (GUI) – replaced by Swing GUI now
- `java.awt.event` – Event for both awt & Swing
- `java.awt.geom` – 2D graphical
- `java.io` – Input/Output data
- `java.lang` – Language – imported by compiler to all java program
- `java.net` – Networking
- `java.sql` – JDBC – databse
- `java.util` – date, time, random, processing large size data, etc
- `java.util.concurrent` – parallel processing

# Importing Packages

- Implicit Import
  - System
  - String
  - Array
  - Default
- Explicit Import
  - Scanner
  - Random
  - “import” - Explicit Statement

# Package

- default package
- **fully qualified class name** - *full package name*  
+ *class name*

```
java.util.Scanner input = new java.util.Scanner( System.in );
```

```

import java.util.Random;

public class Ran
{
    public static void main(String [] argv)
    {
        Random MyRan = new Random();
        int face;

        for(int c=1 ; c<=20; c++)
        {
            face = MyRan.nextInt(6) + 1;
            System.out.print(face);

            if(c%5 == 0)
                System.out.println();
        }
    }
}

```

Output :

51624122414112351535

Output:

31216

46266

66163

65326

```
import java.util.Scanner;
public class Pack
{
    int n;
    double d;
    String s;
    Boolean c;

    public String toString()
    {
        return String.format("Integer:%d\n Double:%f\n String:%s\n
        Boolean:%b\n",n,d,s,c);
    }

    public static void main(String[] argv)
    {
        Pack obj = new Pack();
        Scanner A = new Scanner(System.in);
        System.out.println(obj);
        obj.n = A.nextInt();
        obj.d = A.nextDouble();
        obj.s = A.next();
        obj.c = A.nextBoolean()
        System.out.println(obj);
    }
}
```

# Output

Integer:0

Double:0.000000

String:null

Boolean:false

21

34.574132864234

OOPS

true

Integer:21

Double:34.574133

String:OOPS

Boolean:true

```
import java.util.Scanner;
public class Pack
{
    int n;
    double d;
    String s;
    Boolean c;

    public String toString()
    {
        return String.format("Integer:%d\n Double:%f\n String:%s\n
        Boolean:%b\n",n,d,s,c);
    }

    public static void main(String[] argv)
    {
        Pack obj = new Pack();
        java.util.Scanner A = new java.util.Scanner(System.in);
        System.out.println(obj);
        obj.n = A.nextInt();
        obj.d = A.nextDouble();
        obj.s = A.next();
        obj.c = A.nextBoolean()
        System.out.println(obj);
    }
}
```



# Default Package - Test3.java

```
class test3
{
    int val;

    public String toString()
    {
        return String.format("Test Value:%d \n ",val);
    }

    public void testCall()
    {
        System.out.println("TestCal.....\n");
    }
}
```

# Default Package - Pack.java

```
public class Pack
{
    public static void main(String[] argv)
    {
        test3 newObj = new test3();

        System.out.println("Value: " +newObj.val);

        newObj.testCall();

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

# Package Creation – Time1.java

```
package E.MyPackage.sample;

public class Time1
{
    private int h;

    public void set(int h1)
    {
        h = h1;
    }

    public String toString()
    {
        return String.format("Hour: %d\n",h);
    }
}
```

## Source File – PackTest.java

```
import E.MyPackage.sample;
```

Hour: 22

```
public class PackTest
```

22.360679774997898

```
{
```

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

```
{
```

```
        Time1 A = new Time1();
```

```
        A.set(22);
```

```
        System.out.println(A.toString());
```

```
    }
```

```
}
```

# Static Import – Time1.java

```
package E.MyPackage.sample;
```

```
public class Time1
```

```
{
```

```
    private int h;
```

```
    public void set(int h1)
```

```
    {
```

```
        h = h1;
```

```
    }
```

```
    static public void disp()
```

```
    {
```

```
        System.out.println("Static test.....\n");
```

```
    }
```

```
    public String toString()
```

```
    {
```

```
        return String.format("Hour: %d\n",h);
```

```
    }
```

```
}
```

# Static Import – PackTest.java

```
import static E.MyPackage.sample.Time1.*;
```

```
import static E.MyPackage.sample.Time1.disp;
```

```
public class PackTest
```

```
{
```

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

```
    {
```

```
        //    Time1 A = new Time1();
```

```
        //    A.set(22);
```

```
            disp();
```

```
        //    System.out.println(A.toString());
```

```
        System.out.println(Math.abs(500));
```

```
    }
```

```
}
```

Static test.....

22.360679774997898

# Compilation & Execution

```
E:\>javac -d . Time1.java
```

```
E:\>javac PackTest.java
```

```
E:\>java PackTest
```

```
Static test.....
```

```
22.360679774997898
```

# Access Control

	Private	No Modifier	Protected	Public
Same class	Yes	Yes	Yes	Yes
Same package subclass	No	Yes	Yes	Yes
Same package non-subclass	No	Yes	Yes	Yes
Different package subclass	No	No	Yes	Yes
Different package non-subclass	No	No	No	Yes



Package Explorer

- New
- Go Into
- Open in New Window
- Open Type Hierarchy F4
- Show In Alt+Shift+W
- Copy Ctrl+C
- Copy Qualified Name
- Paste Ctrl+V
- Delete Delete
- Remove from Context Ctrl+Alt+Shift+Down
- Build Path
- Source Alt+Shift+S
- Refactor Alt+Shift+T
- Import...
- Export...
- Refresh F5
- Close Project
- Close Unrelated Projects
- Assign Working Sets...
- Coverage As
- Run As
- Debug As
- Restore from Local History...
- Team
- Compare With
- Configure
- Validate
- Properties Alt+Enter

lab5.java MyTest1.java MyTest.java pgm1.java pgm2.java ankit.java Time1.java PackTest.java ex12.java

1 package Test:

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Package Explorer

- gift
- LabTest
- Module2
  - Test
    - testj
    - testJar
    - Trail

```
1 package Test;
2 import static
3
4 public class
5
6 public sta
7 // TO
8 //Time
9 //A.d
10 disp()
11 }
12
13 }
14
```

New Java Package

Java Package

⚠ Discouraged package name. By convention, package names usually start with a lowercase letter

Creates folders corresponding to packages.

Source folder: Trail/src Browse...

Name: SamplePackage

☐ Create package-info.java


☐ Generate comments (configure templates and default value [here](#))


Finish Cancel

Problems Javadoc Declaration Console Coverage Debug


<terminated> ex12 [Java Application] C:\Program Files\Java\jre1.8.0\_231\bin\javaw.exe (21-Aug-2020, 1:30:11 pm – 1:30:14 pm)

Static test.....

▼  Trail

>  JRE System Library [JavaSE-1

▼  src

 SamplePackage

Package Explorer

- gift
- LabTest
- Module2
- Test
- testj
- testJar
- Trail
- JRE System
- src
  - SamplePackage - Test

lab5.java MyTest1.java MyTest.java pgm1.java pgm2.java ankit.java Time1.java PackTest.java ex12.java

```
1 package Test;
2 import static MyPack.Time1.*;
3
4 public class ex12 {
5
```

New

- Open in New Window
- Open Type Hierarchy F4
- Show In Alt+Shift+W
- Copy Ctrl+C
- Copy Qualified Name
- Paste Ctrl+V
- Delete Delete
- Remove from Context Ctrl+Alt+Shift+Down
- Build Path
- Source Alt+Shift+S
- Refactor Alt+Shift+T
- Import...
- Export...
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- Assign Working Sets...
- Coverage As
- Run As
- Debug As
- Restore from Local History...
- Team
- Compare With
- Validate
- Properties Alt+Enter

Java Project

Project...

Package

Class

Interface

Enum

Annotation

Source Folder

Java Working Set

Folder

File

Untitled Text File

Task

JUnit Test Case

Example...

Other... Ctrl+N

Create a Java class

Console

Coverage

Debug

gram Files\Java\jre1.8.0\_231\bin\javaw.exe (21-Aug-2020, 1:30:11 pm – 1:30:14 pm)

## Java Class

⚠ This package name is discouraged. By convention, package names usually start with a lowercase letter

Source folder:

Package:

☐ Enclosing type:

Name:

Modifiers: ☒ public ☐ package ☐ private ☐ protected  
☐ abstract ☐ final ☐ static

Superclass:

Interfaces:

Which method stubs would you like to create?

- ☒ public static void main(String[] args)
- ☐ Constructors from superclass
- ☒ Inherited abstract methods

Do you want to add comments? (Configure templates and default value [here](#))

- ☐ Generate comments



```
1 package SamplePackage;
2
3 public class MyPackages {
4     |
5     public void welcome()
6     {
7         System.out.println("Good Afternoon");
8         System.out.println(Math.PI);
9     }
10
11 }
12
```

Package Explorer

lab5.java MyTest1.java MyTest.java pgm2.java ankit.java Time1.java PackTest.java ex12.java \*MyPackages.... »

1 package SamplePackage;

New

- Go Into
- Open in New Window
- Open Type Hierarchy F4
- Show In Alt+Shift+W
- Copy Ctrl+C
- Copy Qualified Name
- Paste Ctrl+V
- Delete Delete
- Remove from Context Ctrl+Alt+Shift+Down
- Build Path
- Source Alt+Shift+S
- Refactor Alt+Shift+T
- Import...
- Export...
- Refresh F5
- Close Project
- Close Unrelated Projects
- Assign Working Sets...
- Coverage As
- Run As
- Debug As
- Restore from Local History...
- Team
- Compare With
- Configure
- Validate
- Properties Alt+Enter

Java Project

Project...

Package

Create a Java package

Class

Interface

Enum

Annotation

Source Folder

Java Working Set

Folder

File

Untitled Text File

Task

JUnit Test Case

Example...

Other... Ctrl+N

Task List

Find All A...

Outline








SamplePackage

MyPackages

welcome() ;

Console

C:\Program Files\Java\jre1.8.0\_231\bin\javaw.exe (21-Aug-2020, 1:30:11 pm – 1:30:14 pm)

- ▼  Trail
  - >  JRE System Library [JavaSE
  - ▼  src
    - ▼  SamplePackage
      - >  MyPackages.java
    - ▼  User
      - >  testpck.java



# Import Package

```
package User;

import SamplePackage.MyPackages;

public class testpck {

    public static void main(String[] args) {
        // TODO Auto-generated method stub
        MyPackages A = new MyPackages();
        A.welcome();
    }

}
```

# Output

Good Afternoon

3.141592653589793

# Static method in Package-class

```
package SamplePackage;

public class MyPackages {

    static public void welcome()
    {
        System.out.println("Good Afternoon");
        System.out.println(Math.PI);
    }
}
```

# Test Package program

```
package User;

import static SamplePackage.MyPackages.*;

public class testpck {

    public static void main(String[] args) {
        // TODO Auto-generated method stub
        //MyPackages A = new MyPackages();
        //A.welcome();
        welcome();|
    }

}
```

# Output

Good Afternoon

3.141592653589793