Java Design Patterns – Example Tutorial

PANKAJ — 160 COMMENTS

Design Patterns are very popular among software developers. A design pattern is a well-described solution to a common software problem. I have written extensively on **java design patterns**. You can download PDF eBook (130+ pages) by subscribing to our newsletter.

Java Design Patterns

Some of the benefits of using design patter

1. Design Patterns are already defined a **industry standard approach** to solve problem, so it saves time if we sensibl design pattern. There are many java d patterns that we can use in our java b
2. Using design patterns promotes **reusa** leads to more **robust** and highly main code. It helps in reducing total cost of

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› Observer
› Strategy
› Command
› State
› Visitor
› Interpreter
› Iterator
› Memento

Miscellaneous Design Patterns

› Dependency Injection
› Thread Safety in Java Singleton

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(TCO) of the software product.
3. Since design patterns are already defined, it makes our code easy to understand and debug. It leads to faster development and new members of team understand it easily.

Java Design Patterns are divided into three categories – **creational**, **structural**, and **behavioral** design patterns. This post serves as an index for all the java design patterns articles I have written so far.

- Creational Design Patterns
  - Singleton Pattern
  - Factory Pattern
  - Abstract Factory Pattern
  - Builder Pattern
  - Prototype Pattern
- Structural Design Patterns
  - Adapter Pattern
  - Composite Pattern
  - Proxy Pattern
  - Flyweight Pattern
  - Facade Pattern
  - Bridge Pattern
  - Decorator Pattern
- Behavioral Design Patterns
  - Template Method Pattern
  - Mediator Pattern
  - Chain of Responsibility Pattern
  - Observer Pattern
  - Strategy Pattern
  - Command Pattern
  - State Pattern

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Design Patterns Video Tutorials

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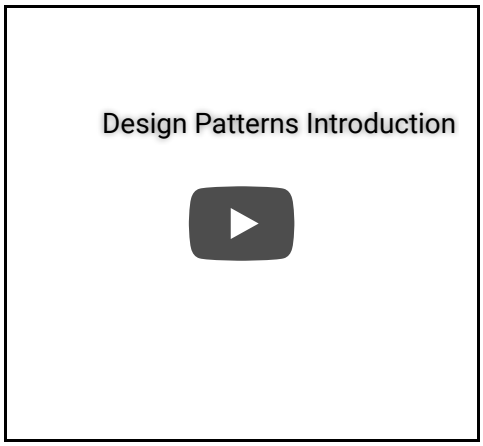

Creational Design Patterns

Creational design patterns provide solution to instantiate a object in the best possible way for specific situations.

1. ### Singleton Pattern

   Singleton pattern restricts the instanti
   class and ensures that only one instar
   class exists in the Java virtual machine
   be a very simple design pattern but w
   to implementation, it comes with a lot
   implementation concerns. The impler
   the Singleton pattern has always beer

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controversial topic among developers. Check out **Singleton Design Pattern** to learn about different ways to implement Singleton pattern and pros and cons of each of the method. This is one of the most discussed java design patterns.

2. ## Factory Pattern

Factory design pattern is used when we have a super class with multiple sub-classes and based on input, we need to return one of the sub-class. This pattern take out the responsibility of instantiation of a class from client program to the factory class. We can apply Singleton pattern on Factory class or make the factory method static. Check out **Factory Design Pattern** for example program and factory pattern benefits. This is one of the most widely used java design pattern.

3. ## Abstract Factory Pattern

Abstract Factory pattern is similar to Factory pattern and it's a factory of factories. If you are familiar with the factory design pattern in java, you will notice that we have a single Factory class that returns the different sub-classes based on the input provided and factory class uses if-else or switch statement to achieve this.

In Abstract Factory pattern, we get rid of if-else block and have a factory class for each sub-class and then an Abstract Factory class that will return the sub-class based on the input factory class. Check out **Abstract Factory Pattern** to know how to implement this pattern with examp

4. ## Builder Pattern

This pattern was introduced to solve s
problems with Factory and Abstract F
patterns when the Object contains a l
attributes. Builder pattern solves the i
large number of optional parameters
inconsistent state by providing a way

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object step-by-step and provide a method that will actually return the final Object. Check out **Builder Pattern** for example program and classes used in JDK.

5. ### Prototype Pattern

   Prototype pattern is used when the Object creation is a costly affair and requires a lot of time and resources and you have a similar object already existing. So this pattern provides a mechanism to copy the original object to a new object and then modify it according to our needs. This pattern uses java cloning to copy the object.

   Prototype design pattern mandates that the Object which you are copying should provide the copying feature. It should not be done by any other class. However whether to use the shallow or deep copy of the Object properties depends on the requirements and it's a design decision. Check out **Prototype Pattern** for sample program.

Structural Design Patterns

Structural patterns provide different ways to create a class structure, for example using inheritance and composition to create a large object from small objects.

1. ### Adapter Pattern

   The adapter design pattern is one of the structural design patterns and it's used so that two unrelated interfaces can work together. The object that joins these unrelated interfaces is called ar
   a real-life example, we can think of a
   charger as an adapter because the m
   needs 3 volts to charge but the norma
   produces either 120V (US) or 240V (In
   mobile charger works as an adapter b
   mobile charging socket and the wall s
   out **Adapter Pattern** for example prog
   usage in Java.

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2. Composite Pattern

Composite pattern is one of the Structural design patterns and is used when we have to represent a part-whole hierarchy. When we need to create a structure in a way that the objects in the structure have to be treated the same way, we can apply the composite design pattern.

Let's understand it with a real-life example – A diagram is a structure that consists of Objects such as Circle, Lines, Triangle etc and when we fill the drawing with color (say Red), the same color also gets applied to the Objects in the drawing. Here drawing is made up of different parts and they all have the same operations. Check out **Composite Pattern** article for different component of composite pattern and example program.

3. Proxy Pattern

Proxy pattern intent is to "Provide a surrogate or placeholder for another object to control access to it". The definition itself is very clear and proxy pattern is used when we want to provide controlled access of a functionality.

Let's say we have a class that can run some command on the system. Now if we are using it, it's fine but if we want to give this program to a client application, it can have severe issues because client program can issue a command to delete some system files or change some settings that you don't want. Check out **Proxy Pattern** post for the example program with implement

4. Flyweight Pattern

Flyweight design pattern is used whe
create a lot of Objects of a class. Sinc
consumes memory space that can be
low memory devices, such as mobile
embedded systems, flyweight design
be applied to reduce the load on mem

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sharing objects. String Pool implementation in java is one of the best example of Flyweight pattern implementation. Check out **Flyweight Pattern** article for sample program and implementation process.

5. ## Facade Pattern

Facade Pattern is used to help client applications to easily interact with the system. Suppose we have an application with a set of interfaces to use MySql/Oracle database and to generate different types of reports, such as HTML report, PDF report etc. So we will have a different set of interfaces to work with different types of database. Now a client application can use these interfaces to get the required database connection and generate reports. But when the complexity increases or the interface behavior names are confusing, the client application will find it difficult to manage it. So we can apply Facade pattern here and provide a wrapper interface on top of the existing interface to help client application. Check out **Facade Pattern** post for implementation details and sample program.

6. ## Bridge Pattern

When we have interface hierarchies in both interfaces as well as implementations, then bridge design pattern is used to decouple the interfaces from implementation and hiding the implementation details from the client programs. Like Adapter pattern, it's one of the Structural design pattern.

The implementation of bridge design
follows the notion to prefer Compositi
inheritance. Check out Bridge Pattern
implementation details and sample p

7. ## Decorator Pattern

The decorator design pattern is used

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functionality of an object at runtime. At the same time, other instances of the same class will not be affected by this, so individual object gets the modified behavior. The decorator design pattern is one of the structural design pattern (such as Adapter Pattern, Bridge Pattern, Composite Pattern) and uses abstract classes or interface with the composition to implement.

We use inheritance or composition to extend the behavior of an object but this is done at compile time and it's applicable to all the instances of the class. We can't add any new functionality to remove any existing behavior at runtime – this is when Decorator pattern comes into the picture. Check out **Decorator Pattern** post for sample program and implementation details.

Behavioral Design Patterns

Behavioral patterns provide solution for the better interaction between objects and how to provide lose coupling and flexibility to extend easily.

1. ## Template Method Pattern

   Template Method is a behavioral design pattern and it's used to create a method stub and deferring some of the steps of implementation to the subclasses. Template method defines the steps to execute an algorithm and it can provide a default implementation that might be common for all or some of the subclasses.

   Suppose we want to provide an algori
   a house. The steps need to be perforr
   house are – building a foundation, bui
   building walls, and windows. The imp
   that we can't change the order of exe
   because we can't build windows befo
   the foundation. So, in this case, we ca
   template method that will use differer
   build the house. Check out **Templat**
   Pattern post for implementation detai

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example program.

2. Mediator Pattern

The mediator design pattern is used to provide a centralized communication medium between different objects in a system. The mediator design pattern is very helpful in an enterprise application where multiple objects are interacting with each other. If the objects interact with each other directly, the system components are tightly coupled with each other that makes maintainability cost higher and not flexible to extend easily. Mediator pattern focuses on to provide a mediator between objects for communication and help in implementing lose-coupling between objects.

Air traffic controller is a great example of a mediator pattern where the airport control room works as a mediator for communication between different flights. The mediator works as a router between objects and it can have it's own logic to provide a way of communication. Check out **Mediator Pattern** post for implementation details with example program.

3. Chain of Responsibility Pattern

Chain of responsibility pattern is used to achieve loose coupling in software design where a request from the client is passed to a chain of objects to process them. Then the object in the chain will decide themselves who will be processing the request and whether the request is required to be sent to the next object in the chain or

We know that we can have multiple c
a try-catch block code. Here every ca
kind of a processor to process that pa
exception. So when an exception occu
block, it's sent to the first catch block
the catch block is not able to process
the request to next object in chain i.e
block. If even the last catch block is n

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process it, the exception is thrown outside of the chain to the calling program.

ATM dispense machine logic can be implemented using **Chain of Responsibility Pattern**, check out the linked post.

4. ## Observer Pattern

Observer design pattern is useful when you are interested in the state of an object and want to get notified whenever there is any change. In observer pattern, the object that watch on the state of another object are called **Observer** and the object that is being watched is called **Subject**.

Java provides an inbuilt platform for implementing Observer pattern through java.util.Observable class and java.util.Observer interface. However, it's not widely used because the implementation is really simple and most of the times we don't want to end up extending a class just for implementing Observer pattern as java doesn't provide multiple inheritances in classes.

Java Message Service (JMS) uses Observer pattern along with Mediator pattern to allow applications to subscribe and publish data to other applications. Check out **Observer Pattern** post for implementation details and example program.

5. ## Strategy Pattern

Strategy pattern is used when we have multiple algorithm for a specific task and client
actual implementation to be used at r

Strategy pattern is also known as Poli
We define multiple algorithms and let
application pass the algorithm to be u
parameter. One of the best examples
pattern is the Collections.sort() metho
the Comparator parameter. Based on
implementations of Comparator interf

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Objects are getting sorted in different ways.

Check out **Strategy Pattern** post for implementation details and example program.

6. Command Pattern

Command Pattern is used to implement lose coupling in a request-response model. In command pattern, the request is send to the invoker and *invoker* pass it to the encapsulated *command* object. Command object passes the request to the appropriate method of *Receiver* to perform the specific action.

Let's say we want to provide a File System utility with methods to open, write and close the file and it should support multiple operating systems such as Windows and Unix.

To implement our File System utility, first of all, we need to create the receiver classes that will actually do all the work. Since we code in terms of Java interfaces, we can have FileSystemReceiver interface and it's implementation classes for different operating system flavors such as Windows, Unix, Solaris etc. Check out **Command Pattern** post for the implementation details with example program.

7. State Pattern

State design pattern is used when an Object change it's behavior based on it's internal state.

If we have to change the behavior of a based on its state, we can have a state the Object and use if-else condition b perform different actions based on the pattern is used to provide a systemati coupled way to achieve this through C State implementations.

Check out **State Pattern** post for impl

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details with example program.

8. ## Visitor Pattern

   Visitor pattern is used when we have to perform an operation on a group of similar kind of Objects. With the help of visitor pattern, we can move the operational logic from the objects to another class.

   For example, think of a Shopping cart where we can add a different type of items (Elements), when we click on the checkout button, it calculates the total amount to be paid. Now we can have the calculation logic in item classes or we can move out this logic to another class using visitor pattern. Let's implement this in our example of a visitor pattern. Check out **Visitor Pattern** post for implementation details.

9. ## Interpreter Pattern

   is used to defines a grammatical representation for a language and provides an interpreter to deal with this grammar.

   The best example of this pattern is java compiler that interprets the java source code into byte code that is understandable by JVM. Google Translator is also an example of an interpreter pattern where the input can be in any language and we can get the output interpreted in another language.

   Check out **Interpreter Pattern** post for example program.

10. ## Iterator Pattern

    Iterator pattern in one of the behavior
    it's used to provide a standard way to
    through a group of Objects. Iterator pa
    widely used in Java Collection Framev
    Iterator interface provides methods fo
    through a collection.

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Iterator pattern is not only about traversing through a collection, but we can also provide different kind of iterators based on our requirements. Iterator pattern hides the actual implementation of traversal through the collection and client programs just use iterator methods. Check out **Iterator Pattern** post for example program and implementation details.

11. ### Memento Pattern

    The memento design pattern is used when we want to save the state of an object so that we can restore later on. Memento pattern is used to implement this in such a way that the saved state data of the object is not accessible outside of the object, this protects the integrity of saved state data.

    Memento pattern is implemented with two objects – Originator and Caretaker. The originator is the object whose state needs to be saved and restored and it uses an inner class to save the state of Object. The inner class is called Memento and it's private so that it can't be accessed from other objects.

    Check out **Memento Pattern** for sample program and implementation details.

Miscellaneous Design Patterns

There are a lot of design patterns that does
under GoF design patterns. Let's look at so
popular design patterns.

1. ### DAO Design Pattern

   DAO design pattern is used to decoup
   persistence logic to a separate layer. D
   popular pattern when we design syste
   with databases. The idea is to keep th

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layer separate from the Data Access layer. This way we implement Separation of Logic in our application.

Checkout DAO Pattern for complete details and example program.

2. ## Dependency Injection Pattern

Dependency Injection allows us to remove the hard-coded dependencies and make our application loosely coupled, extendable, and maintainable. We can implement dependency injection in java to move the dependency resolution from compile-time to runtime. Spring framework is built on the principle of dependency injection.

Read more about Dependency Injection Pattern to understand how to implement it in our Java application.

3. ## MVC Pattern

MVC Pattern is one of the oldest architectural pattern for creating web applications. MVC stands for Model-View-Controller.

Checkout MVC Pattern for more details and complete example code.

That's all for different design patterns in Java, this post intent is to provide an index to browse all of them easily.

You can checkout Java Design Patte
example code from our GitHub Rep

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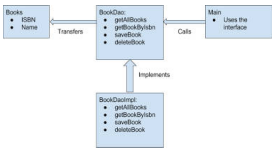

DAO Design Pattern

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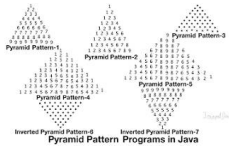

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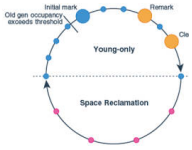

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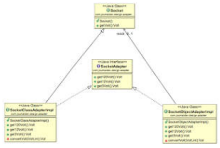

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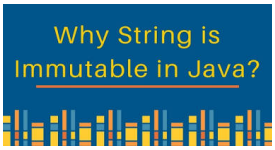

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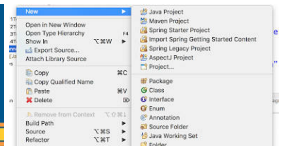

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hi pankaj kindly tell me the profiler design pattern……..
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Ganesh says
JULY 12, 2018 AT 4:12 AM
awesome bro. great article. I really appreciate your effort.
Reply

Rimpi says
JULY 4, 2018 AT 8:49 PM
B. B
LL. BL
UUU. BLU
EEEE. BLUE
JJJJJJ BLUEJ
How to print this pattern
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Anirban says
AUGUST 2, 2018 AT 11:35 PM

```
Scanner sc = new Scanner ( System.in );
//Input your String
String inputString = sc.nextLine();
int lengthOfString = inputString.length();
for(int i = 0; i < lengthOfString ; i ++ ) {
for ( int j = 0; j <= i ; j ++ ) {
System.out.print ( inputString.charAt (i ));
}
System.out.println ( inputString.substring ( 0, i + 1
). );
}
```

Reply

mahesh says
AUGUST 24, 2018 AT 1:30 AM

```
String s="BLUEJ";
StringBuffer sb;
StringBuffer sb2;
char [] c = s.toCharArray();
for(int i=1; i<=c.length; i++){
sb=new StringBuffer();
sb2=new StringBuffer();
for(int j=1; j<=i; j++){
sb.append(c[i-1]);
sb2.append(c[j-1]);
}
sb.append(".").append(sb2);
System.out.println(sb.toString());
}
```

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raksha says
OCTOBER 5, 2018 AT 3:14 AM

```
System.out.println("B. B");
System.out.println("LL. BL");
System.out.println("UUU. BLU");
```

System.out.println("EEEE. BLUE");
System.out.println("JJJJJJ BLUEJ");
System.out.println("How to print this pattern");
ez af.
Reply

Sr says
DECEMBER 21, 2018 AT 12:10 PM
It's just funny answer.. Haha
Reply

Abbin Varghese says
MAY 15, 2018 AT 3:13 AM
Very nice article. Thanks for all the information.
One thing i missed in these is that, the explanations are according to the package structure. I think first we should think about the use case, and then the pattern.
For eg. "Mediator design pattern is very helpful in an enterprise application where multiple objects are interacting with each other." But when do we decide objects should interact with each other and why not Observer Pattern or Visitor Pattern? What we should or shouldn't use this patterns from a real life scenario ?
If these informations are added, this will be a perfect article.. 🙂
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Alphabetically(just like the in GOF bool
be easier to follow them and memorize
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How do we adapt the version changes of common library like Apache in our existing code ?
For example , if I am using method of some common library in multiple classes and method signature get changed in upgrade version ?
what is the best solution not to make changes in all classes rather then in single point ?
My guess : Creat a separate class and use the common method inside the class and use this class reference everywhere .
Reply

Nishant says
JUNE 1, 2018 AT 3:57 AM
Adapter patter serves best here , the client program would adapt to the changes via the adapter class.
Reply

Nishant says
JUNE 1, 2018 AT 3:59 AM
An adapter pattern would server b
a bit surprised as the Apache libs
backward compatible.
Reply

X
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novapattern.com says
NOVEMBER 9, 2017 AT 1:11 PM
This is by far the most comprehensive tutorial / guide I've come across.
Reply

Emanuel says
AUGUST 9, 2017 AT 6:09 PM
How to do this please is very important
W I N D H O E K
W I N D H O E
W I N D H O
W I N D H
W I N D
W I N
W I
W
L
L I
L I N
L I N G
L I N G U
L I N G U A
Reply

X
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S U R A J says
SEPTEMBER 5, 2017 AT 1:50 AM

```
s="WINDHOEK"
t="LINGUA"
for i in range(0,len(s)):
for j in range(0,len(s)-i):
print(s[j],end=" ")
if i!=len(s)-1:
print()
for i in range(0,len(t)+1):
for j in range(0,i):
print(t[j],end=" ")
print()
```

Reply

Roy El Asmar says
OCTOBER 5, 2017 AT 2:39 AM

```
public class MyClass {
public static void main(String args[]) {
String s1="WINDHOEK";
String s2="LINGUA";
for(int i=s1.length()-1;i>=0;i--){
System.out.println(s1.substring(0,i+1));
}
for(int j=0;j<=s2.length()-1;j++){
System.out.println(s2.substring(0,j+1));
}
}
}
```

Reply

Abhishek says
MAY 31, 2018 AT 7:50 PM

```
String a="WINDHOEK";
String b="LINGUA";
String s="";
int temp=a.length();
for(int i=a.length()-1;i>=0;i--)
```

X
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```
{
for(int j=0;j<=i;j++)
{
s=s+a.charAt(j);
}
System.out.println(s);
s="";
}
s="";
for(int i=0;i=0;j–)
{
s=b.charAt(j)+s;
}
System.out.println(s);
s="";
}
```

Reply

Geethu says
JUNE 27, 2017 AT 11:09 PM
Hi Pankaj,
Consider a situation where our management has decided to integrate a new jar instead of old one. The new jar provides the same set of operations which was used by old jar, but the number of arguments or the datatype of the argument (header parameter of the function) is different from the existing. It will be very difficult to change the method parameters across the application.
Which design pattern suits well in this case with minimum number of modification in th
Thanks,
Geethu
Reply

X
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Amit Bhatia says
AUGUST 10, 2017 AT 4:34 AM
Adapter
Reply

Stefan says
MAY 9, 2017 AT 7:17 AM
Slight typo on the section for Bridge Pattern it says " When we have interface hierarchies in both interfaces as well as implementations, then builder design pattern "..... but we are talking about the Bridget Pattern and Structural Patterns
Reply

Pankaj says
MAY 9, 2017 AT 9:03 AM
Thanks for the tip, corrected the typo error.
Reply

Arsallmam says
FEBRUARY 10, 2017 AT 2:44 PM
Great blog
Reply

Luke Fan says
FEBRUARY 7, 2017 AT 9:20 PM
It's good for me. Thank you for these.
Reply

X
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tathagata bhattacharya says
DECEMBER 28, 2016 AT 2:23 AM
I need help.Can you help me in this:
15 14 13 12 11
10 9 8 7
6 5 4
3 2
1
Reply

Anonymous says
JANUARY 23, 2017 AT 3:39 AM
void main()
{
int i,j,a=15;
for(i =1;i=I;j–)
{
printf(“%d”,a);
a–;
}
printf(“\n”);
}
Reply

Maruthi says
JUNE 20, 2017 AT 10:19 PM
void main()
{
int i,j,a=15;
for(i =5;i<1;i–)
{
for(j =1;j<i;j++)
{
printf(“%d”,a);
a–;
}
printf(“\n”);
}
}

X
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Reply

Srikanth says
DECEMBER 5, 2017 AT 1:37 AM

```
public static void main(String[] args) {
Scanner s = new Scanner(System.in);
System.out.println("Enter the number");
int value = Integer.parseInt(s.next());
int numberOfNumbers =0;
int count=1;
int row =1;
for(int i = 1;i<=value;i++){
row =i;
if(i%2!=0){
numberOfNumbers = i * count;
} else {
numberOfNumbers = (i*count)+count;
count++;
}
if(numberOfNumbers == value){
break;
} else if (numberOfNumbers value){
value=numberOfNumbers;
break;
}
}
System.out.println("all "+numberOfNumbers+"
numbers to be displayed in number of rows is
"+row);
for(int i=row; i>=1;i–){
for(int rows=1;rows<=i;rows++){
System.out.print(numberOfNumbe
}
System.out.println();
}
}
```

Reply

X
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anjali says
NOVEMBER 16, 2016 AT 9:29 PM
Hi i need the ebook
java design patterns
Reply

Nikhil Aggarwal says
DECEMBER 31, 2016 AT 3:52 AM
Download Head first design patterns book.
Reply

Ranga Kalyan says
SEPTEMBER 7, 2016 AT 5:38 PM
This blog post on design patterns is great! I particularly like your links that show examples. Very helpful.
I use a lot of design patterns in my Java work. I come to your blog often, to clarify their differences.
Thank you for posting it.
Ranga
Reply

Ranga says
AUGUST 28, 2016 AT 1:43 PM
Great post.. Thanks!
Reply

Balaji says
AUGUST 23, 2016 AT 6:45 AM
Hi Pankaj,
I just want to thank you. The work you
great, it's making developers life easie
Thank a lot for your great work again.

X
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One query i have that might be wrong but just to clarify:
1. In Decorator Pattern – We are using inheritance or aggregation to extend the behavior of an object…..and not the "Composition", I think Aggregation is correct to say here than Composition.
what you say?
Reply

a says
AUGUST 10, 2016 AT 7:00 AM
how to print
1
1 2 1
1 2 3 2 1
1 2 3 4 3 2 1
1 2 3 2 1
1 2 1
1
Reply

Lalit Sharma says
AUGUST 11, 2016 AT 5:29 AM

```
public void printStars(int num, int limit)
{
if (num > limit)
return;
else
{
for (int q = 1; q <= num; q++){
System.out.print(q);
}
System.out.print("\n");
printStars(num +1, limit);
for (int q = 1; q <= num; q++){
System.out.print(q);
}
System.out.print("\n");
}
}
```

X
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Reply

Veera says
JANUARY 18, 2017 AT 5:03 AM

```
public void printStars(int num, int limit)
{
int count =0;
if (num > limit)
return;
else
{
for (int q = 1; q 1;q–)
{
System.out.print(q-1);
count++;
}
if(count==(limit-1)){
}
else{
System.out.print("\n");
}
printStars(num +1, limit);
for (int q = 1; q 1;q–)
{
if(count==(limit-1)){
}
else{
System.out.print((q-1));
}
}
if(count==(limit-1)){
System.out.print("\n");
}
else{
System.out.print("\n");
}
}
}
```

Reply

X
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Veera says
JANUARY 18, 2017 AT 5:04 AM
Please use the above code to display the required format
Reply

vinay says
SEPTEMBER 25, 2017 AT 9:23 PM
still i am getting errors in program
Reply

Padam Dhariwal says
AUGUST 9, 2016 AT 7:45 AM
Very nice articles.
Reply

Prashanth says
JULY 18, 2016 AT 12:46 AM
Brother, add examples or link it in another page. It would be quite helpful.
Reply

Prashanth says
JULY 18, 2016 AT 12:48 AM
Nice examples and easily underst
Seems links are not working only f
Reply

Pankaj says
JULY 18, 2016 AT 1:38 AM
can you tell me which link is r

X
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Reply

Vikram says
JULY 16, 2016 AT 10:32 AM
Very Nice article and well written with very good examples
Reply

Atul says
JULY 7, 2016 AT 2:54 AM
Pankaj,
Write a program to print this series.
129876
245335
483728
092872
387763
Reply

Hayawan says
NOVEMBER 24, 2016 AT 12:07 PM
public class numbers () {
system.out.println (129876 "+" 245335 "+" 483728 "+" 092872 "+" 387763);
return null;
}
Reply

Hayawan says
NOVEMBER 24, 2016 AT 12:41 PM
public class Numbers {
public static void main(String[] arg
System.out.println(129876);

X
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System.out.println(245335);
System.out.println(483728);
System.out.println(992872);
}
};
this is the right way, i was rushing before, sorry.
Reply

chetan says
JUNE 14, 2016 AT 3:09 AM
Hi Pankaj,
Singleton Design Pattern hyperlink not working.
Reply

Pankaj says
JUNE 14, 2016 AT 5:29 AM
Thanks Chetan for noticing and pointing out, I was doing some post update and mistakenly removed the link. I have corrected it. Thanks again.
Reply

Shailendra says
JULY 2, 2016 AT 2:22 PM
0 1 2 3
0 1 2
0 1
0
0 1
0 1 2
0 1 2 3
Reply

Shailendra says
JULY 2, 2016 AT 2:31 PM
4

X
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3 4
2 3 4
1 2 3 4
0 1 2 3 4
1 2 3 4
2 3 4
3 4
4
Reply

Boovaragan says
JUNE 10, 2016 AT 6:58 AM
Hi Sir,
what about Service Locator patter?
under which category will it come?
Reply

Vijay Kumar says
MAY 20, 2016 AT 3:56 AM
Awesome articles on Design patterns so far I have read.
Reply

Pankaj says
MAY 28, 2016 AT 10:46 AM
Thanks Vijay, make sure to get the
subscribing to the newsletter.
Reply

X
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Java Learner says
APRIL 26, 2016 AT 5:43 AM
Guru,

This is great, no words the way you wrote the article.
Love it, Love it, Love it.
Thanks
Reply

Pankaj says
MAY 28, 2016 AT 10:46 AM
You made my day brother.
Reply

Don says
APRIL 4, 2016 AT 11:24 PM
Help full
Reply

Pankaj says
MAY 28, 2016 AT 10:46 AM
Thanks Don, appreciate the nice words.
Reply

ejakhan says
MARCH 27, 2016 AT 12:48 AM
1 2 3 4 5
10 9 8 7 6
11 12 13 14 15
20 19 18 17 16
Reply

X
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Pankaj says
MAY 28, 2016 AT 10:47 AM
I don't understand what you are asking, and how it's anywhere related to java design patterns.
Reply

shreya says
MARCH 26, 2016 AT 8:26 AM
1 3 5 7 9
3 5 7 9 1
5 7 9 1 3
7 9 1 3 5
9 1 3 5 7
help please!!!!!
Reply

Suyash says
MAY 23, 2016 AT 12:37 AM
int[] arr = new int[]{1, 3, 5, 7, 9};
for (int i = 0; i < 5; i++) {
for (int j = 0; j < arr.length; j++) {
System.out.print(arr[j] % 10 + " ");
arr[j] = arr[j] + 2;
}
System.out.println("\n");
}
Reply

Pankaj says
MAY 28, 2016 AT 10:48 AM
Thanks Suyash for respondin
Shreya.
Reply

X
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mahesh says
MARCH 16, 2016 AT 11:36 PM
wow Super Pankaj ,very easy to understand
Reply

Pankaj says
MAY 28, 2016 AT 10:48 AM
Thanks Mahesh, get the eBook too. 🙂
Reply

Santeepa says
FEBRUARY 29, 2016 AT 6:40 AM
plzz tell me how to do this
NO Data Pattern
1 5
3 5 10
5 5 10 15
Reply

Vishnu says
MARCH 13, 2016 AT 11:27 PM

```
public class Pattern {
static int c = 1;
static int p = 5;
static int x = 2;
public static void main(String[] args) {
for (int i = 2; i < 5; i++) {
for (int j = 0; j < x; j++) {
if (j == 0)
System.out.print(c);
else {
System.out.print(p);
p += 5;
}
System.out.print('\t');
}
c += 2;
```

X
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```
System.out.print('\n');
x++;
p = 5;
}
}
}
```

Reply

Pankaj says
MAY 28, 2016 AT 10:49 AM
Thanks Vishnu for responding and quick solution, I hope it helps Santeepa.
Reply

khushi says
APRIL 19, 2017 AT 8:45 PM
plz solve it anybody
if user gives(3,2)as an input then the output should be
7 9 11
3 5
1
1
3 5
plz solve this question in and share thiis code.
Reply

Kush says
JANUARY 15, 2016 AT 11:50 AM
Very simple examples and nicely expla
not have been possible to learn desig
without your book. Thanks a ton for yo
Reply

X
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Pankaj says
MAY 28, 2016 AT 10:50 AM
Wow, one of the nicest comment I have got recently.
Reply

Chirag Sharma says
DECEMBER 27, 2015 AT 9:54 PM
There should be some real time problem also as a example to complete this tutorial.
Reply

Pankaj says
MAY 28, 2016 AT 10:52 AM
If I will provide real life problem, it will become too specific and too lengthy. Also there are many ways to solve a real life problem, it depends on your project specific situation. You should learn these design patterns and use them wisely. You should not use a design pattern just because you know it.
Always remember, simple code is the best code.
Reply

Vidita Daga says
OCTOBER 19, 2015 AT 9:33 AM
Thank you so much...This is really helpf
Reply

X
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Pankaj says
MAY 28, 2016 AT 10:52 AM
Appreciate your lovely words, Vidita. 🙂
Reply

suresh atta says
SEPTEMBER 4, 2015 AT 7:28 PM
Simply awsome. I llike your write ups and examples.
Reply

Pankaj says
MAY 28, 2016 AT 10:53 AM
Thanks Suresh, I hope you will like my eBook for design patterns too. It's absolutely free for my email subscribers.
Reply

Himalaya says
APRIL 30, 2015 AT 8:03 AM
Hi, Blog information is really nice. Please provide a "Scroll to Top" option in your website. Many thanks 🙂
Reply

Pankaj says
MAY 28, 2016 AT 10:54 AM
Hmm, nice suggestion. I want to d
will add some more resources and
page speed. I have kept bare mini
make sure page load fast for every
Reply

X
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Ranga says
MARCH 23, 2015 AT 10:16 PM
Great work. I'm a great believer that understanding the context where a Design Pattern is applicable is more important than the actual implementation details. This article gives a good overview. I think this video will also be a good guide. Video
Reply

Pankaj says
MAY 28, 2016 AT 10:57 AM
Thanks for the nice words Ranga.
Reply

Aryan says
JANUARY 12, 2015 AT 12:46 PM
Nice article, good examples, easy to follow. I am using it to prepare for Software Engineering exam which is in two days. Thank you.
Reply

Pankaj says
MAY 28, 2016 AT 10:57 AM
I am replying late but I wish you did well.
Reply

sree says
JANUARY 12, 2015 AT 12:32 AM
is MVC pattern belongs to which categ
Reply

Pankaj says

X
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MAY 28, 2016 AT 10:58 AM

It belongs to Java EE patterns.

Reply

Neeraj says

JANUARY 8, 2015 AT 3:05 AM

In One For Loop

```
public class Test {
public static void main(String arg[]){
int c =1;
int d =1;
int till =15;
for(int b=till;b>0;b–){
System.out.print(b+" “);
if(d==c){
System.out.println(“”);
c++;
d=0;
}
d++;
}
}
}
```

Reply

Pankaj says

JANUARY 8, 2015 AT 5:00 AM

What is your query here?

Reply

Atmprakash Sharma says

NOVEMBER 20, 2014 AT 10:07 PM

nice ..well manged data…i read most of

get confident in java….keep it up….

Reply

X

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Pankaj says
MAY 28, 2016 AT 10:59 AM
Thanks Atmprakash, good to hear from a regular read.
Reply

Oleg says
OCTOBER 28, 2014 AT 5:11 AM
It would be creat to see tutotials about DAO and MVC patterns and how to use them with JDBC.
Reply

Pankaj says
MAY 28, 2016 AT 11:01 AM
Added to my TODO list, will publish it soon.
Reply

abhinav says
SEPTEMBER 28, 2016 AT 7:44 AM
still waiting for the same.
Reply

j says
OCTOBER 23, 2014 AT 5:46 PM
Simple explanations on common desig
Thanks!
Reply

Pankaj says
MAY 28, 2016 AT 11:01 AM
You are welcome 'J'. 🙂

X
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Reply

Tanmoy says
OCTOBER 21, 2014 AT 11:25 PM
how to do this program
1 2 3 4 5
6 7 8 9
10 11 12
13 14
15
Reply

rao arsalan says
DECEMBER 22, 2014 AT 3:53 AM
here is your program!!!!!!
class Pattern{
public static void main(String a[]){
int k=5;
int i,j;
int z;
for(i=1;i<=15;i=z){
for(j=i;j<=k;j++){
System.out.print(j);}
System.out.println();
k=(k+j)-i-1;
z=j;
}
}
}
Reply

Ganesh Ahiwale says
DECEMBER 23, 2014 AT 4:11 AM
cnt=1;
for(i=n;i<0;n–)
{
for(j=0;j<i;j++)
{

X
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System.out.print(cnt);
}
System.out.println();
cnt=cnt+1;
}
Reply

Pankaj says
MAY 28, 2016 AT 11:02 AM
Thanks guys for pitching in and helping Tanmoy.
Reply

jayesh says
OCTOBER 15, 2014 AT 3:32 AM
how to do
1
24
369
481216
Reply

Vijay Bharwani says
JANUARY 5, 2015 AT 2:47 AM
I am not sure whether you solved it or not. But it is pretty simple. Below is the prog
pattern
public static void main(String args
int lines = 4;
for (int i = 1; i <= lines; i++) {
for (int j = 1; j <= i; j++) {
System.out.print(i*j);
}
System.out.println();
}

X
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}

Reply

Pankaj says

MAY 28, 2016 AT 11:02 AM

i hope your program helped Jayesh.

Reply

Ashakant says

OCTOBER 6, 2014 AT 11:00 AM

This is also very nice simple explanation :

```
public interface Duck
{
public void quack() ;
public void fly() ;
}
public interface Turkey
{
public void gobble() ;
public void fly() ;
}
public class TurkeyAdapter implements Duck
{
private Turkey mTurkey;
public void quack() {
// TODO Auto-generated method stub
mTurkey.gobble() ;
}
public void fly() {
// TODO Auto-generated method stub
for(int i=0;i<5;i++)
mTurkey.fly() ;
}
}
```

TurkeyAdapter link between Duck and

Reply

X

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Pankaj says
MAY 28, 2016 AT 11:06 AM
You need implementation of Turkey interface and then inject it to TurkeyAdapter private variable mTurkey by setter method or through constructor. My 2 cents, however I am not sure if there was a query here. ☺
Reply

Chidambar Dorairaj says
SEPTEMBER 8, 2014 AT 12:11 AM
Awesome tutorials Pankaj. Keep up the good work.
Reply

Pankaj says
MAY 28, 2016 AT 11:06 AM
Thanks Chidambar, appreciate nice words.
Reply

groovy says
AUGUST 19, 2014 AT 10:02 PM
Some developers becomes so obsessed with design patterns that they over-engineer.
Reply

vijay says
SEPTEMBER 16, 2014 AT 8:39 AM
But for most, it is a good learning.
Reply

Pankaj says
MAY 28, 2016 AT 11:07 AM

X
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Design patterns are good to know, but don't use it just because you know it. See your requirement and if there is a benefit in using design pattern, then only apply it.
Simple code is the Best Code. 🙂
Reply

Rama says
AUGUST 4, 2014 AT 1:57 AM
Really good for refreshing the concepts. Thanks a lot 🙂
Reply

Pankaj says
MAY 28, 2016 AT 11:08 AM
Yeah I know, I also come by this once in a while to refresh my learning too. 🙂
Reply

Marquis says
JULY 14, 2014 AT 8:31 AM
2 words Thank you!
Reply

Pankaj says
MAY 28, 2016 AT 11:08 AM
2 words – "Appreciate it" 🙂
Reply

X
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Cristian Manoliu says
JUNE 24, 2014 AT 3:32 AM
Hello
I've been struggling with design patterns, but this document explains them so well.
Thank you for the lesson.
Best regards,
Cristian
Reply

Pankaj says
MAY 28, 2016 AT 11:09 AM
Hey Cristian, thanks for nice words. You can get my Design Pattern PDF eBook too by subscribing to my email newsletter.
Reply

Hossein Moradi says
JUNE 17, 2014 AT 11:52 PM
Thanks a lot for the instructive tutorial...
Reply

Pankaj says
MAY 28, 2016 AT 11:09 AM
You are welcome brother.
Reply

jitendra says
JUNE 17, 2014 AT 9:42 AM
This is excellent tutorial with best & sin
examples, compared to other tutorials
pattern its easy to understand with gre
The description given about each patte

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to decide which pattern should be used where. I read it like a story book.
Reply

Pankaj says
MAY 28, 2016 AT 11:10 AM
Thanks Jitendra, you just made me smile. 🙂
Reply

jerry says
MAY 29, 2014 AT 9:04 PM
very useful. thanks a lot.
Reply

Pankaj says
MAY 28, 2016 AT 11:11 AM
Thanks Jerry, I hope Tom is not giving you a lot of trouble these days. 😀
Reply

Pranay says
APRIL 29, 2014 AT 6:21 AM
great work...
Reply

Pankaj says
MAY 28, 2016 AT 11:11 AM
Thanks Pranay.
Reply

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Delli Babs says
APRIL 25, 2014 AT 7:07 PM
This is excellent work sir !!! really helpful
Reply

Pankaj says
MAY 28, 2016 AT 11:11 AM
You are welcome Delli.
Reply

chandrani says
APRIL 20, 2014 AT 7:13 AM
Great work!
Thanks.
Reply

Pankaj says
MAY 28, 2016 AT 11:11 AM
You are welcome Chandrani.
Reply

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SRK says
APRIL 9, 2014 AT 10:34 AM
Excellent site to know about all design patterns.
Reply

Pankaj says
MAY 28, 2016 AT 11:12 AM
I tried to cover as much as possible, to the best of my knowledge. 🙂
Reply

job@basware.com says
MARCH 12, 2014 AT 12:45 PM
This is a really good blog, and I always follow your blog whenever I need any clearance.
Reply

Pankaj says
MAY 28, 2016 AT 11:12 AM
Thanks for appreciation.
Reply

Ravikumar says
MARCH 5, 2014 AT 1:48 PM
Excellent Explanation, Wonderful exan
understood easily... Thanks
Reply

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Pankaj says
MAY 28, 2016 AT 11:13 AM
You are welcome Ravikumar.
Reply

Usha says
MARCH 4, 2014 AT 6:35 AM
One of the best article on Design pattern, Thanks.
Reply

Pankaj says
MAY 28, 2016 AT 11:13 AM
Thanks Usha for kind words.
Reply

Varun says
JANUARY 22, 2014 AT 7:25 AM
This tutorial was very helpful ; thanks Pankaj ...waiting for J2EE Design Patterns tutorial
Reply

Pankaj says
MAY 28, 2016 AT 11:13 AM
I have added it on my TODO list, h
soon on them.
Reply

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Naveen says
AUGUST 28, 2013 AT 4:17 AM
Hi your blog is really good, I request yo

more on struts2 from basics to advance.
Reply

Pankaj says
MAY 28, 2016 AT 11:14 AM
Struts2 tutorials are posted, i hope you find them useful.
Reply

Syam says
AUGUST 27, 2013 AT 1:16 AM
Hi Pankaj,
Thanks a lot for the tutorial.
Could you please also include J2EE Design Patterns also. (MVC, Business Delegates..)
Reply

Pankaj says
AUGUST 27, 2013 AT 7:17 PM
They are coming next, mostly in next month.
Reply

Nestor says
AUGUST 17, 2013 AT 4:35 AM
Hey your blog is really good. congratul
Reply

Deepika Gurav says
SEPTEMBER 22, 2015 AT 11:41 PM
how to print
1
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Reply

jay says

NOVEMBER 4, 2015 AT 9:09 PM

```
public class Pattern {
public static void main(String[] args) {
for(int i=1;i<6;i++){
for(int j=1;j<i;j++){
if((i+j)%2==0){
System.out.print("0");
}
else
{
System.out.print("1");
}
}
System.out.println();
}
}
}
```

Reply

Pankaj says

MAY 28, 2016 AT 11:14 AM

Thanks for the help buddy.

Reply

parth says

AUGUST 10, 2017 AT 10:26 PM

thanks

Reply

X

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Ymg says

MARCH 2, 2017 AT 9:56 AM

You can refer this code

```
class demo
{
public static void main(String args[])
{
int i,j,zero=0,one=1;
for(i=1;i0;j–)
{
if(j==1 || j==3 || j==5)
{
System.out.print(one+ “\t”);
}
else if(j==2 || j==4)
{
System.out.print(zero+ “\t”);
}
}
System.out.print(“\n”);
}
}
}
```

Reply

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If you want to post XML content, then please escape < with < and > with > otherwise they will not be shown properly.

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