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Design Principles and Patterns

Exercise 2: Implementing the Factory Method Pattern

The Factory Method Pattern is a **creational design pattern** that defines an interface for creating objects, but lets subclasses alter the type of objects that will be created.
It is useful when the exact type of object needs to be determined at runtime.

Code:

NotificationFactory.java

```
interface Notification {
    void notifyUser();
}
class EmailNotification implements Notification {
    public void notifyUser() {
        System.out.println("Sending an Email Notification");
    }
}
class SMSNotification implements Notification {
    public void notifyUser() {
        System.out.println("Sending an SMS Notification");
    }
}
class PushNotification implements Notification {
    public void notifyUser() {
        System.out.println("Sending a Push Notification");
    }
```

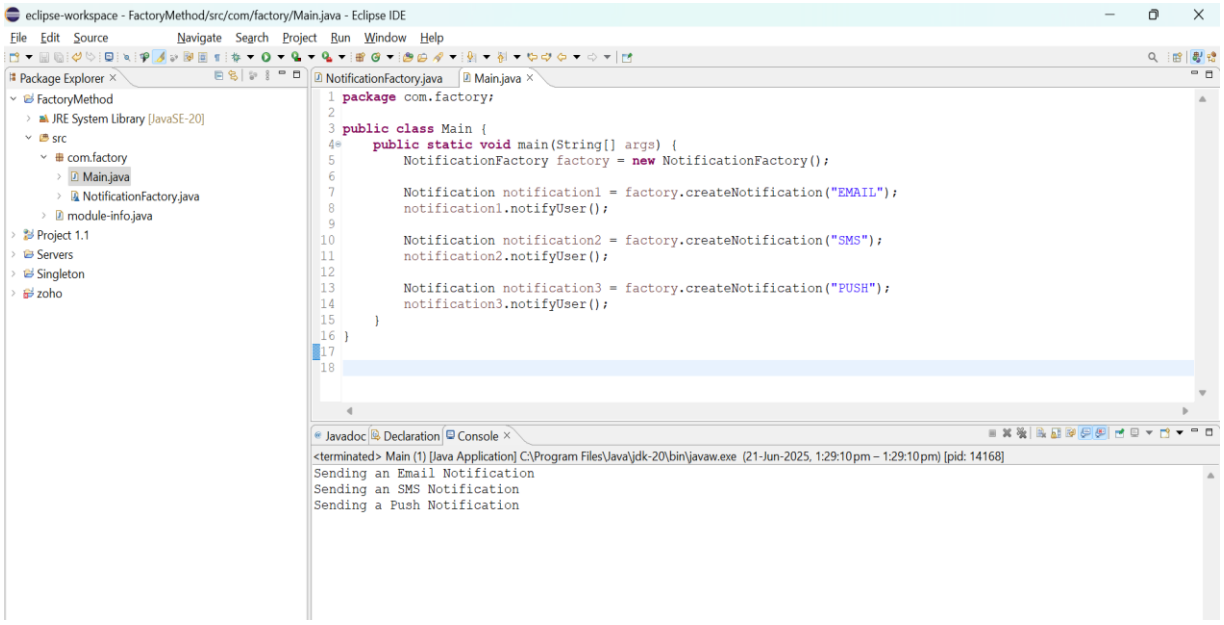
```
}
class NotificationFactory {
    public Notification createNotification(String channel) {
        if (channel == null || channel.isEmpty()) return null;

        switch (channel.toUpperCase()) {
            case "EMAIL": return new EmailNotification();
            case "SMS": return new SMSNotification();
            case "PUSH": return new PushNotification();
            default: return null;
        }
    }
}
```

Main.java

```
public class Main {
    public static void main(String[] args) {
        NotificationFactory factory = new NotificationFactory();
        Notification notification1 = factory.createNotification("EMAIL");
        notification1.notifyUser();
        Notification notification2 = factory.createNotification("SMS");
        notification2.notifyUser();
        Notification notification3 = factory.createNotification("PUSH");
        notification3.notifyUser();
    }
}
```

Output:


eclipse-workspace - FactoryMethod/src/com/factory/Main.java - Eclipse IDE
File Edit Source Navigate Search Project Run Window Help
Package Explorer
FactoryMethod
JRE System Library [JavaSE-20]
src
com.factory
Main.java
NotificationFactory.java
module-info.java
Project 1.1
Servers
Singleton
zoho
NotificationFactory.java
Main.java
1 package com.factory;
2
3 public class Main {
4 public static void main(String[] args) {
5 NotificationFactory factory = new NotificationFactory();
6
7 Notification notification1 = factory.createNotification("EMAIL");
8 notification1.notifyUser();
9
10 Notification notification2 = factory.createNotification("SMS");
11 notification2.notifyUser();
12
13 Notification notification3 = factory.createNotification("PUSH");
14 notification3.notifyUser();
15 }
16 }
17
18
Javadoc Declaration Console
<terminated> Main (1) [Java Application] C:\Program Files\Java\jdk-20\bin\javaw.exe (21-Jun-2025, 1:29:10 pm – 1:29:10 pm) [pid: 14168]
Sending an Email Notification
Sending an SMS Notification
Sending a Push Notification