



CAIRO UNIVERSITY – Computers and Artificial Intelligence.

Department: software engineering.

Course: Software Maintenance and Evolution.

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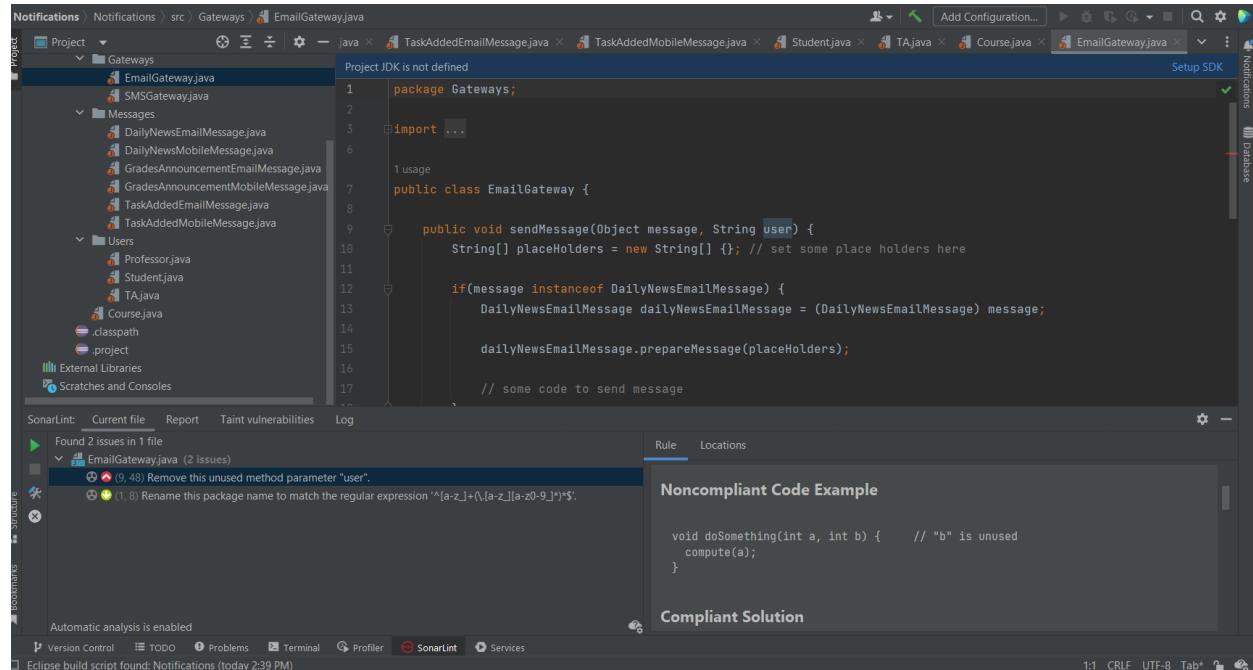
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1- Static Analysis Report for current code

The report below contains snapshots of the current code generated using the static analysis tool: Sonarlint.

1.1. Gateways Package

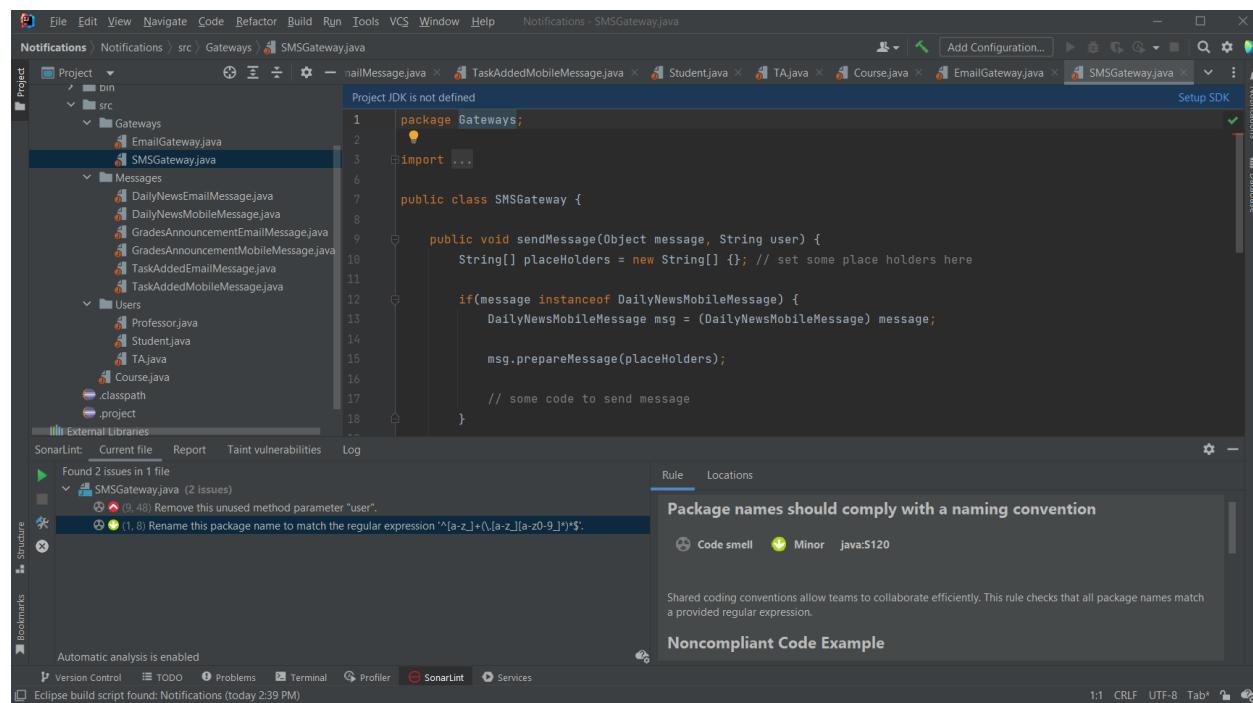


SonarLint analysis results for `EmailGateway.java`:

- Found 2 issues in 1 file
- `EmailGateway.java (2 Issues)`
 - Remove this unused method parameter "user".
 - Rename this package name to match the regular expression `^([a-z_]+([a-z_][a-z0-9_]+)*$)`.

Code snippet from `EmailGateway.java`:

```
1 package Gateways;
2 import ...
3
4 public class EmailGateway {
5
6     public void sendMessage(Object message, String user) {
7         String[] placeHolders = new String[]{}; // set some place holders here
8
9         if(message instanceof DailyNewsEmailMessage) {
10             DailyNewsEmailMessage dailyNewsEmailMessage = (DailyNewsEmailMessage) message;
11
12             dailyNewsEmailMessage.prepareMessage(placeHolders);
13
14             // some code to send message
15
16         }
17     }
18 }
```



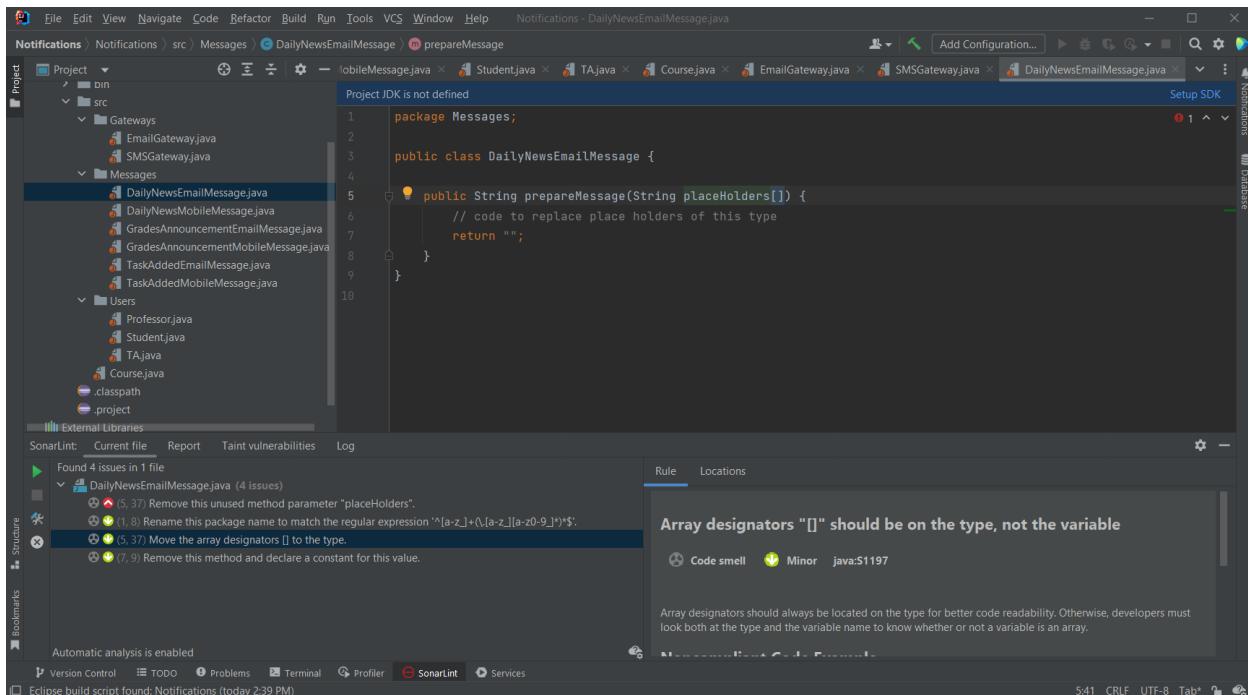
SonarLint analysis results for `SMSGateway.java`:

- Found 2 issues in 1 file
- `SMSGateway.java (2 Issues)`
 - Remove this unused method parameter "user".
 - Rename this package name to match the regular expression `^([a-z_]+([a-z_][a-z0-9_]+)*$)`.

Code snippet from `SMSGateway.java`:

```
1 package Gateways;
2 import ...
3
4 public class SMSGateway {
5
6     public void sendMessage(Object message, String user) {
7         String[] placeHolders = new String[]{}; // set some place holders here
8
9         if(message instanceof DailyNewsMobileMessage) {
10             DailyNewsMobileMessage msg = (DailyNewsMobileMessage) message;
11
12             msg.prepareMessage(placeHolders);
13
14             // some code to send message
15
16         }
17     }
18 }
```

1.2. Messages Package



```
package Messages;

public class DailyNewsEmailMessage {

    public String prepareMessage(String placeHolders[]) {
        // code to replace place holders of this type
        return "";
    }
}
```

Found 4 issues in 1 file

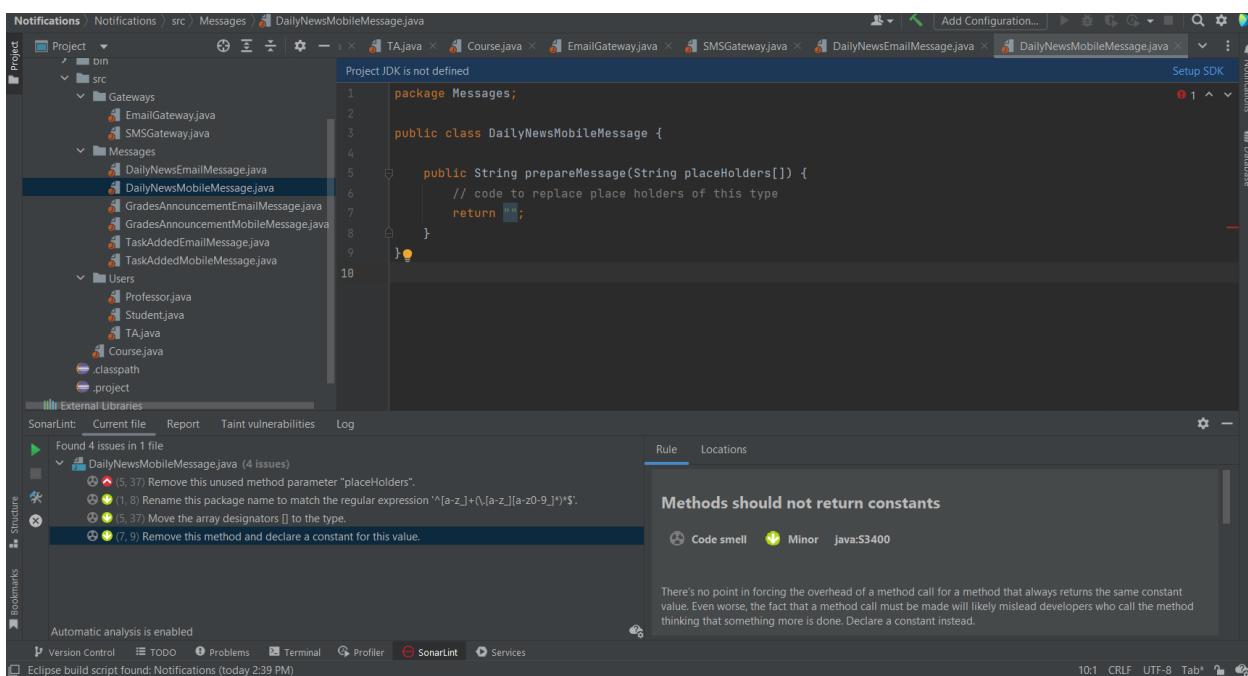
- Remove this unused method parameter "placeHolders".
- Rename this package name to match the regular expression "[a-zA-Z]+([a-zA-Z][a-zA-Z-0-9]+)*\$".
- Move the array designators [] to the type.
- Remove this method and declare a constant for this value.

Rule Locations

Array designators "[]" should be on the type, not the variable

Code smell Minor java:S1197

Array designators should always be located on the type for better code readability. Otherwise, developers must look both at the type and the variable name to know whether or not a variable is an array.



```
package Messages;

public class DailyNewsMobileMessage {

    public String prepareMessage(String placeHolders[]) {
        // code to replace place holders of this type
        return "";
    }
}
```

Found 4 issues in 1 file

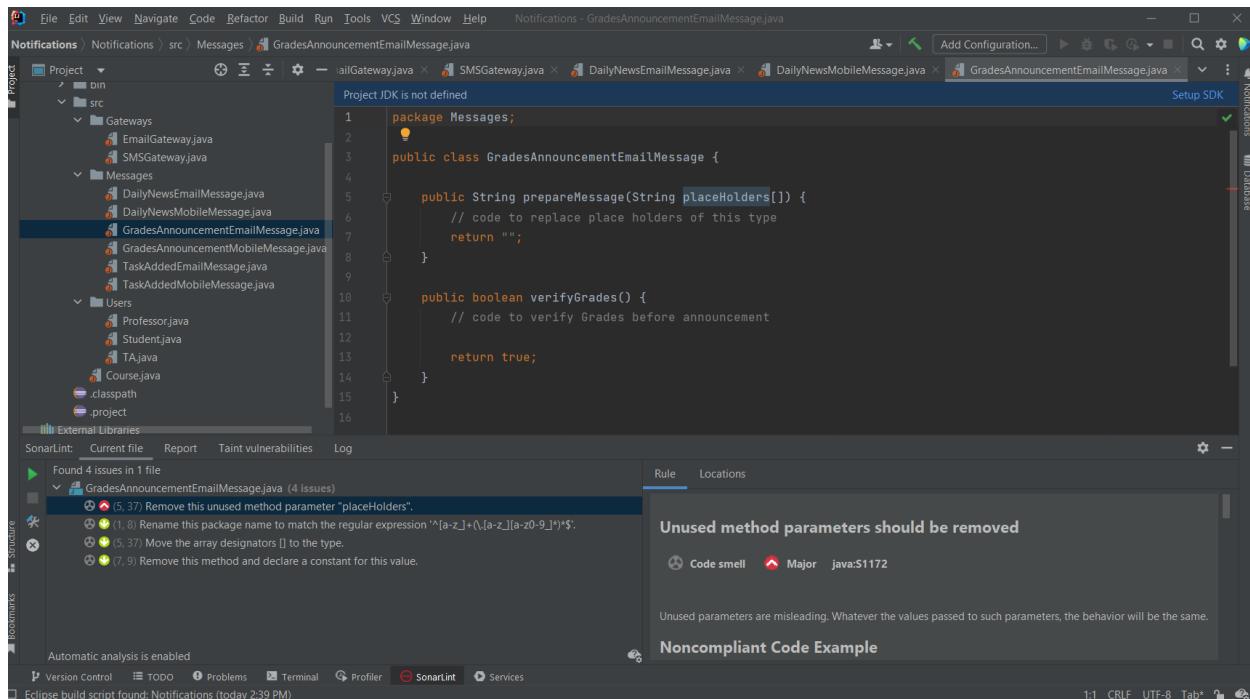
- Remove this unused method parameter "placeHolders".
- Rename this package name to match the regular expression "[a-zA-Z]+([a-zA-Z][a-zA-Z-0-9]+)*\$".
- Move the array designators [] to the type.
- Remove this method and declare a constant for this value.

Rule Locations

Methods should not return constants

Code smell Minor java:S3400

There's no point in forcing the overhead of a method call for a method that always returns the same constant value. Even worse, the fact that a method call must be made will likely mislead developers who call the method thinking that something more is done. Declare a constant instead.



Notifications - GradesAnnouncementEmailMessage.java

```
1 package Messages;
2
3 public class GradesAnnouncementEmailMessage {
4
5     public String prepareMessage(String placeHolders[]) {
6         // code to replace place holders of this type
7         return "";
8     }
9
10    public boolean verifyGrades() {
11        // code to verify Grades before announcement
12
13        return true;
14    }
15
16 }
```

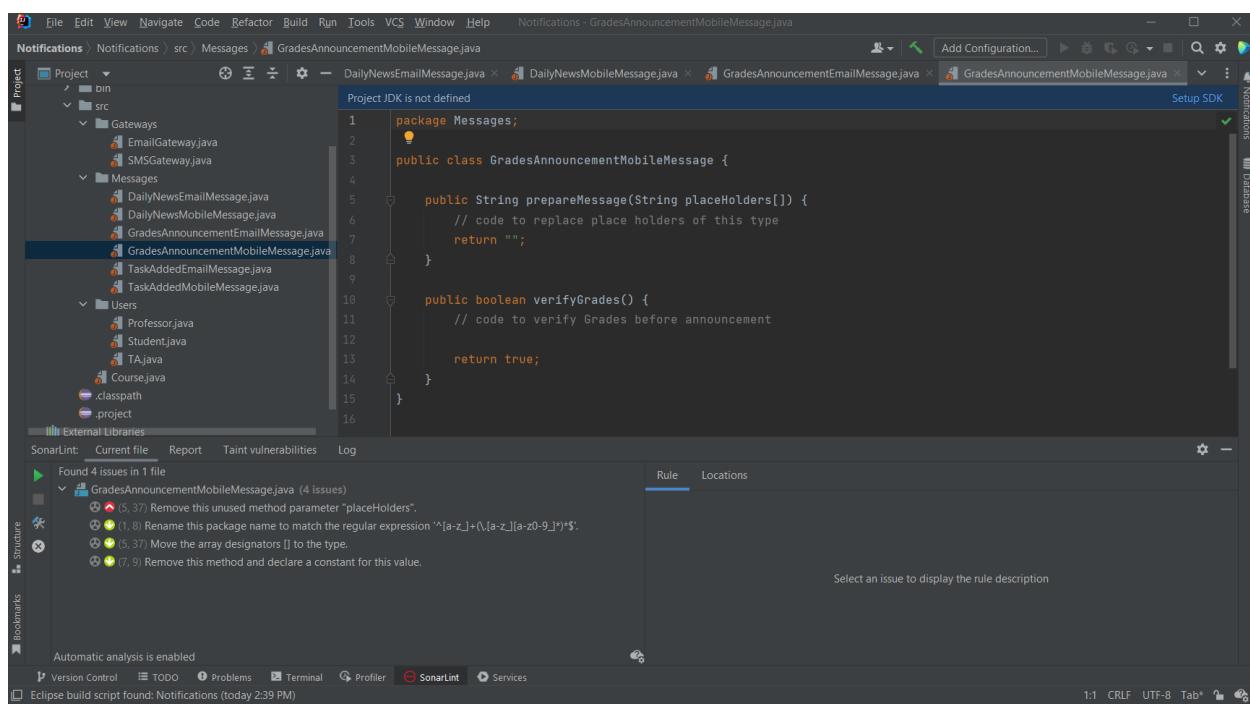
Found 4 issues in 1 file

GradesAnnouncementEmailMessage.java (4 issues)

- Remove this unused method parameter "placeHolders".
- Rename this package name to match the regular expression "^[a-z_]+([a-z_][a-z0-9_])*\$".
- Move the array designators [] to the type.
- Remove this method and declare a constant for this value.

Automatic analysis is enabled

1:1 CRLF UTF-8 Tab*



Notifications - GradesAnnouncementMobileMessage.java

```
1 package Messages;
2
3 public class GradesAnnouncementMobileMessage {
4
5     public String prepareMessage(String placeHolders[]) {
6         // code to replace place holders of this type
7         return "";
8     }
9
10    public boolean verifyGrades() {
11        // code to verify Grades before announcement
12
13        return true;
14    }
15
16 }
```

Found 4 issues in 1 file

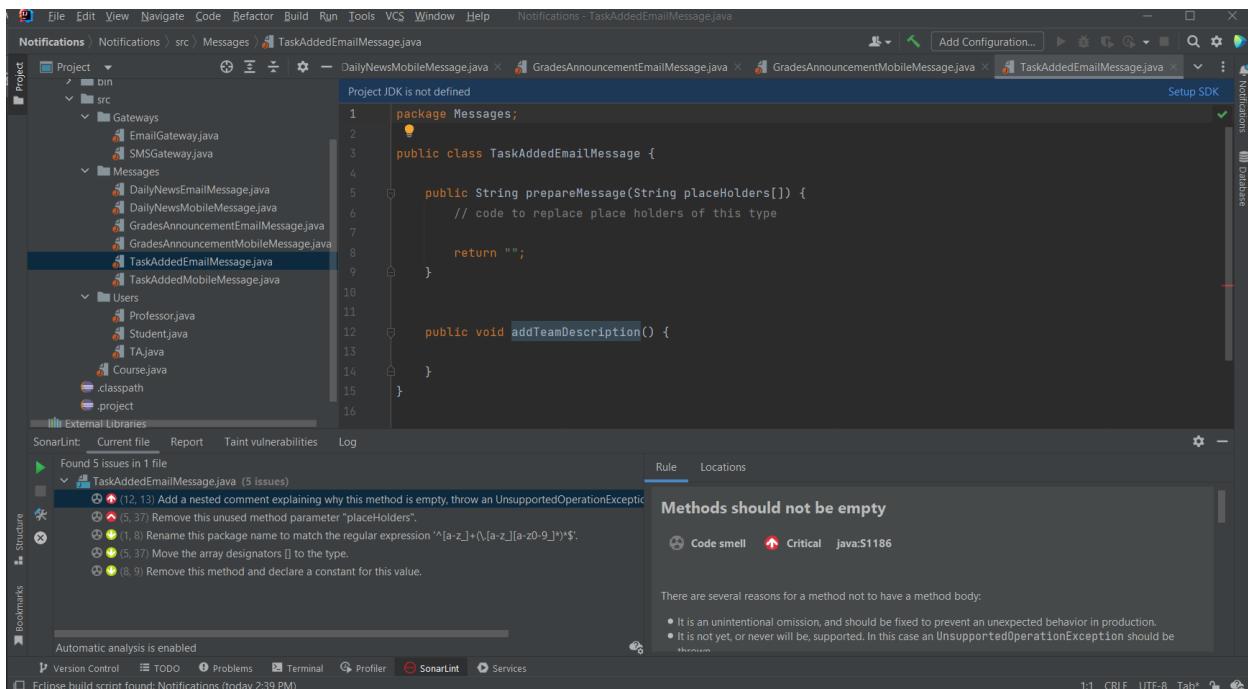
GradesAnnouncementMobileMessage.java (4 issues)

- Remove this unused method parameter "placeHolders".
- Rename this package name to match the regular expression "^[a-z_]+([a-z_][a-z0-9_])*\$".
- Move the array designators [] to the type.
- Remove this method and declare a constant for this value.

Select an issue to display the rule description

Automatic analysis is enabled

1:1 CRLF UTF-8 Tab*



Notifications - TaskAddedEmailMessage.java

```
1 package Messages;
2
3 public class TaskAddedEmailMessage {
4
5     public String prepareMessage(String placeHolders[]) {
6         // code to replace place holders of this type
7
8         return "";
9     }
10
11     public void addTeamDescription() {
12
13     }
14 }
```

Found 5 issues in 1 file

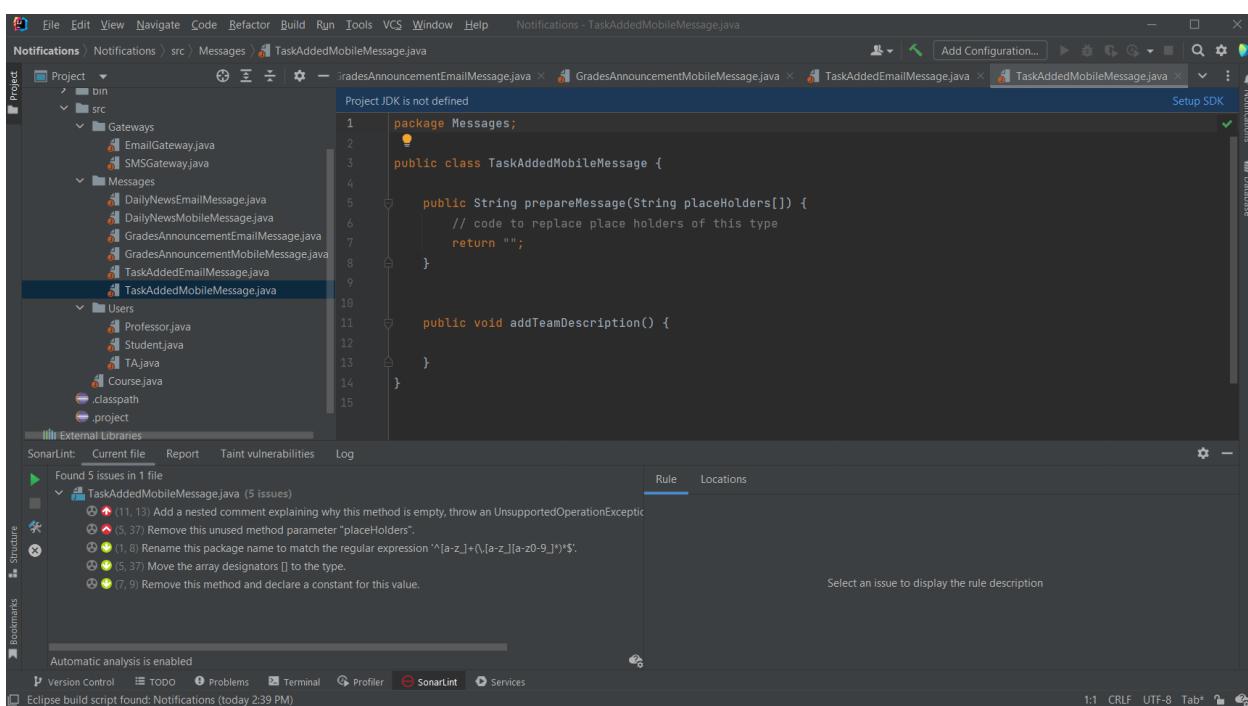
TaskAddedEmailMessage.java (5 issues)

- (12, 13) Add a nested comment explaining why this method is empty, throw an UnsupportedOperationException
- (5, 37) Remove this unused method parameter "placeHolders".
- (1, 8) Rename this package name to match the regular expression ^[a-z_]+([a-z_][a-z0-9_])*\$.
- (5, 37) Move the array designators [] to the type.
- (8, 9) Remove this method and declare a constant for this value.

Automatic analysis is enabled

Version Control TODO Problems Terminal Profiler SonarLint Services

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Notifications - TaskAddedMobileMessage.java

```
1 package Messages;
2
3 public class TaskAddedMobileMessage {
4
5     public String prepareMessage(String placeHolders[]) {
6         // code to replace place holders of this type
7
8         return "";
9     }
10
11     public void addTeamDescription() {
12
13     }
14 }
```

Found 5 issues in 1 file

TaskAddedMobileMessage.java (5 issues)

- (11, 13) Add a nested comment explaining why this method is empty, throw an UnsupportedOperationException
- (5, 37) Remove this unused method parameter "placeHolders".
- (1, 8) Rename this package name to match the regular expression ^[a-z_]+([a-z_][a-z0-9_])*\$.
- (5, 37) Move the array designators [] to the type.
- (7, 9) Remove this method and declare a constant for this value.

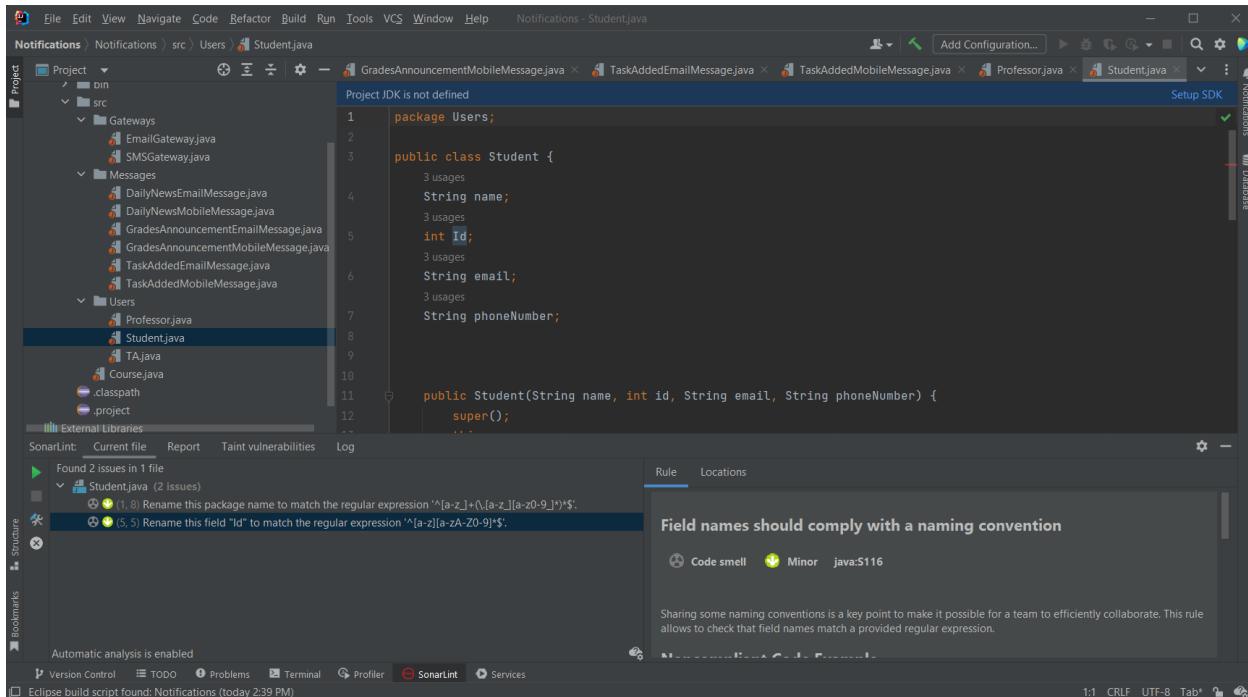
Select an issue to display the rule description

Automatic analysis is enabled

Version Control TODO Problems Terminal Profiler SonarLint Services

1:1 CRLF UTF-8 Tab*

1.3. Users Package



```
package Users;

public class Student {
    String name;
    int Id;
    String email;
    String phoneNumber;

    public Student(String name, int id, String email, String phoneNumber) {
        super();
    }
}
```

Found 2 issues in 1 file

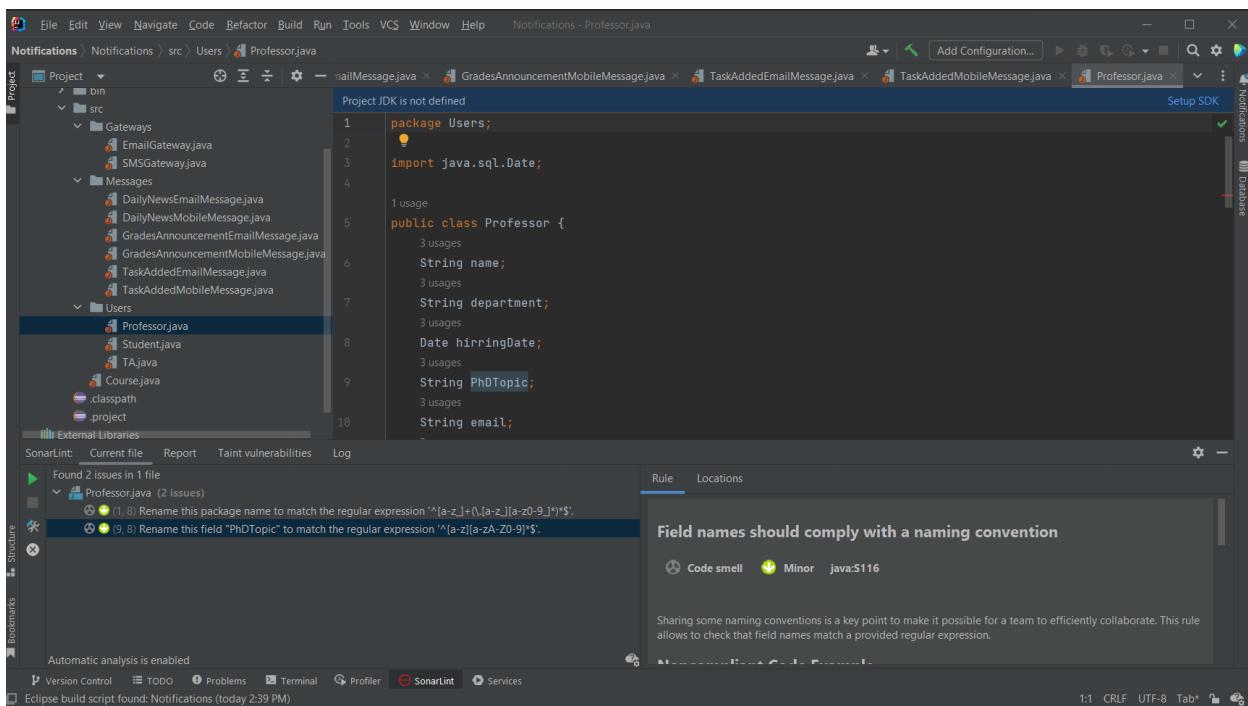
- Student.java (2 issues)
 - (1, 8) Rename this package name to match the regular expression `^([a-zA-Z]+([a-zA-Z][a-zA-Z0-9])*)\$`.
 - (5, 5) Rename this field "Id" to match the regular expression `^([a-zA-Z][a-zA-Z0-9])*\$`.

Rule Locations

Field names should comply with a naming convention

Code smell Minor java:S116

Sharing some naming conventions is a key point to make it possible for a team to efficiently collaborate. This rule allows to check that field names match a provided regular expression.



```
package Users;

import java.sql.Date;

public class Professor {
    String name;
    String department;
    Date hiringDate;
    String PhDTopic;
    String email;
}
```

Found 2 issues in 1 file

- Professor.java (2 issues)
 - (1, 8) Rename this package name to match the regular expression `^([a-zA-Z]+([a-zA-Z][a-zA-Z0-9])*)\$`.
 - (9, 8) Rename this field "PhDTopic" to match the regular expression `^([a-zA-Z][a-zA-Z0-9])*\$`.

Rule Locations

Field names should comply with a naming convention

Code smell Minor java:S116

Sharing some naming conventions is a key point to make it possible for a team to efficiently collaborate. This rule allows to check that field names match a provided regular expression.

```

1 package Users;
2
3 public class TA {
4     String name;
5     String department;
6     String email;
7     String phoneNumber;
8
9     public TA(String name, String department, String email, String phoneNumber) {
10        super();
11    }
12 }

```

1.4. Course

```

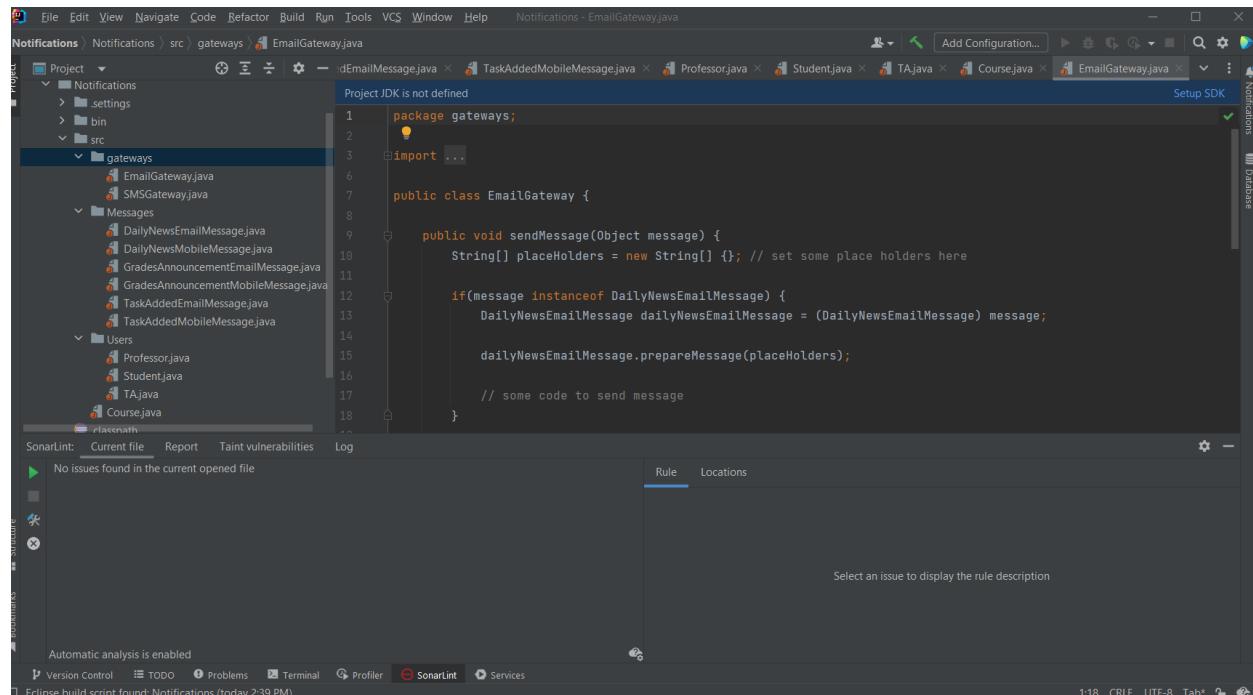
1 import java.util.ArrayList;
2
3 import Gateways.EmailGateway;
4 import Messages.TaskAddedEmailMessage;
5 import Users.TA;
6 import Users.Student;
7 import Users.TA;
8
9 public class Course {
10     String name;
11     String code;
12     ArrayList<String> announcements;
13     ArrayList<String> exams;
14     ArrayList<String> grades;
15 }

```

2- Initial fixation of the generated sonarLint issues

2.1. gateways Package

- Fixed the unused method (user) parameter by removing it.
- Fixed the package name by making the first letter small (gateways).



```
package gateways;
import ...

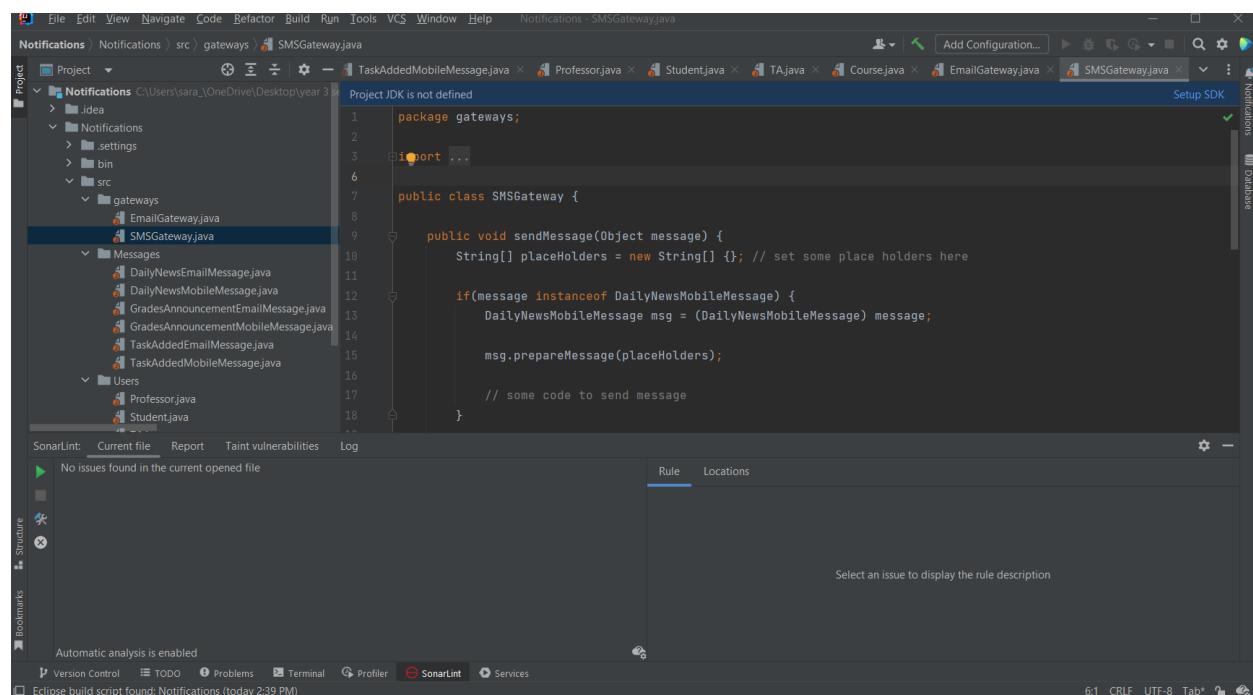
public class EmailGateway {

    public void sendMessage(Object message) {
        String[] placeHolders = new String[]{}; // set some place holders here

        if(message instanceof DailyNewsEmailMessage) {
            DailyNewsEmailMessage dailyNewsEmailMessage = (DailyNewsEmailMessage) message;

            dailyNewsEmailMessage.prepareMessage(placeHolders);

        } // some code to send message
    }
}
```



```
package gateways;
import ...

public class SMSGateway {

    public void sendMessage(Object message) {
        String[] placeHolders = new String[]{}; // set some place holders here

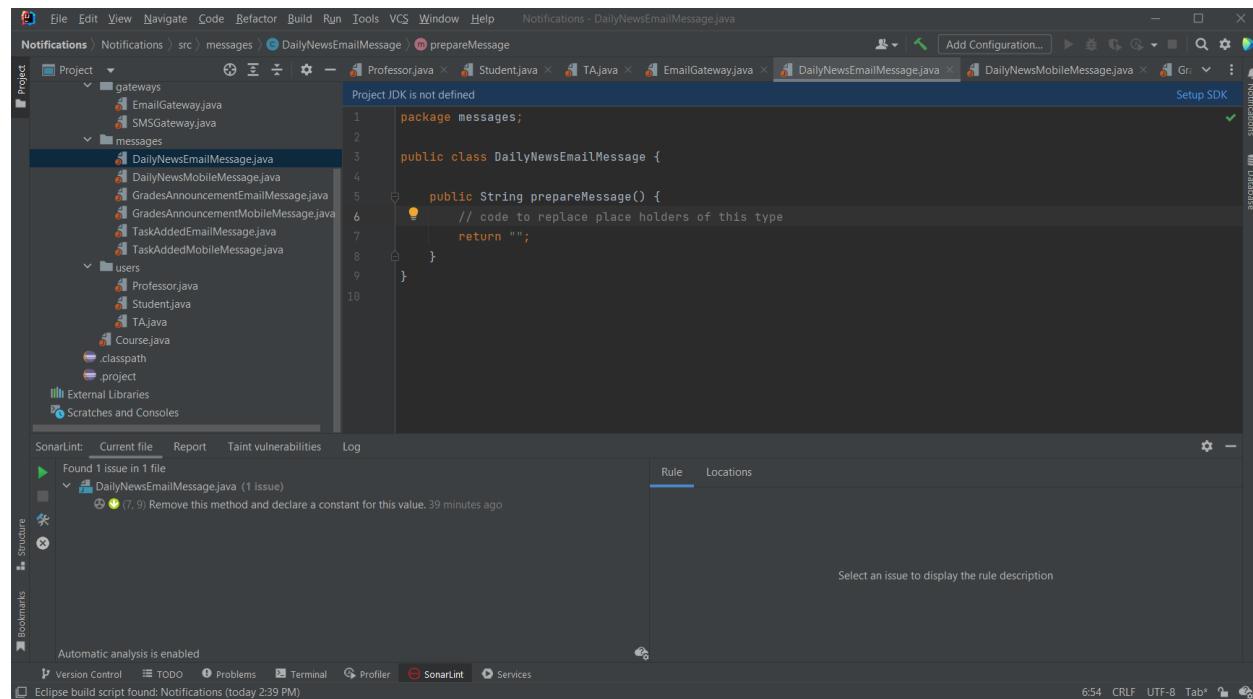
        if(message instanceof DailyNewsMobileMessage) {
            DailyNewsMobileMessage msg = (DailyNewsMobileMessage) message;

            msg.prepareMessage(placeHolders);

        } // some code to send message
    }
}
```

2.2. messages Package

- Unused parameter method (PlaceHolders) has not been resolved yet (might be resolved later after applying design patterns).
- Fixed the package name by making the first letter small (messages).
- Fixed the array designator issue by moving it forward before the parameter name.
- Removing a method to declare a constant has not been resolved yet (since we are dealing with a skeletal code, certain methods are yet to be fixed in later steps).



```
package messages;

public class DailyNewsEmailMessage {

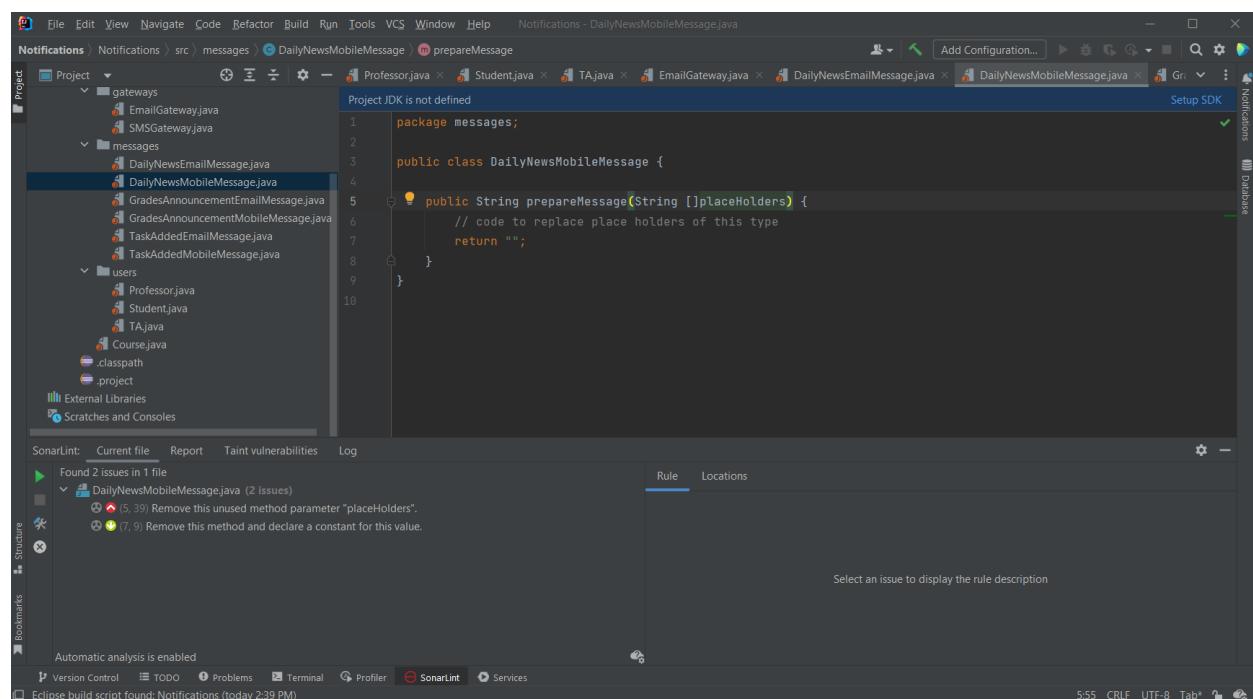
    public String prepareMessage() {
        // code to replace place holders of this type
        return "";
    }
}
```

SonarLint: Current file Report Taint vulnerabilities Log

Found 1 issue in 1 file

- DailyNewsEmailMessage.java (1 issue)
 - (7, 9) Remove this method and declare a constant for this value, 39 minutes ago

Select an issue to display the rule description



```
package messages;

public class DailyNewsMobileMessage {

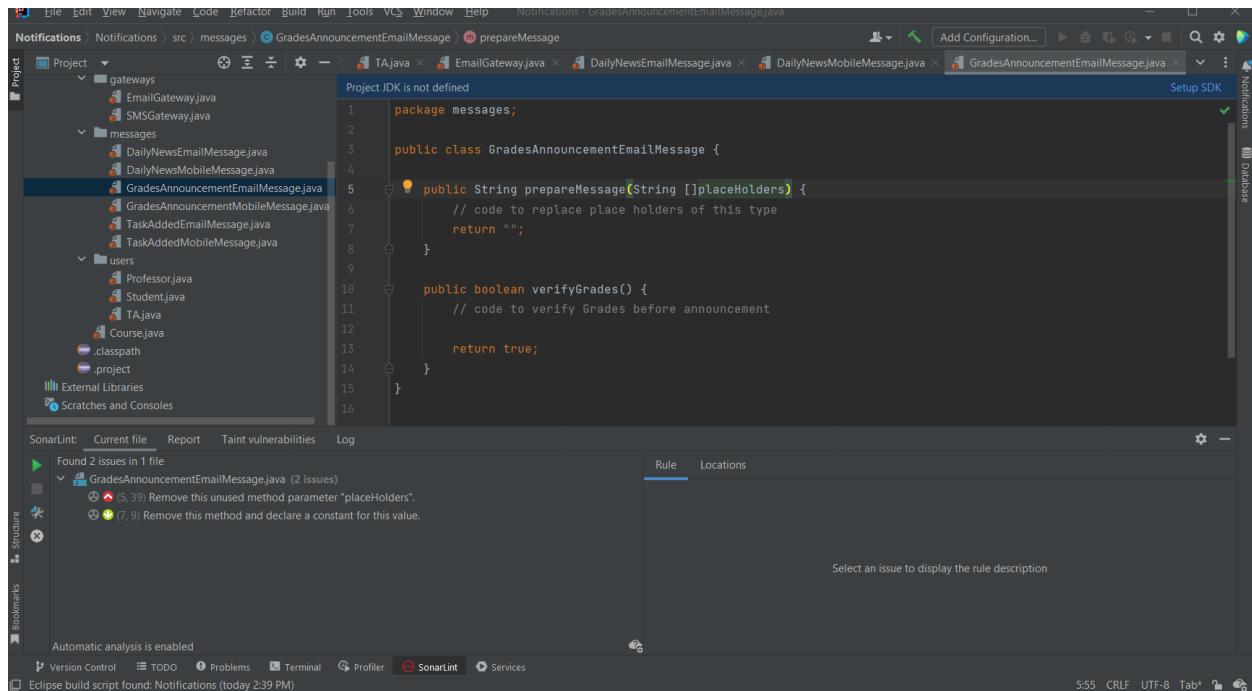
    public String prepareMessage(String []placeHolders) {
        // code to replace place holders of this type
        return "";
    }
}
```

SonarLint: Current file Report Taint vulnerabilities Log

Found 2 issues in 1 file

- DailyNewsMobileMessage.java (2 issues)
 - (5, 39) Remove this unused method parameter "placeHolders".
 - (7, 9) Remove this method and declare a constant for this value.

Select an issue to display the rule description



Notifications > Notifications > src > messages > GradesAnnouncementEmailMessage > prepareMessage

Project JDK is not defined

```
package messages;

public class GradesAnnouncementEmailMessage {

    public String prepareMessage(String []placeHolders) {
        // code to replace place holders of this type
        return "";
    }

    public boolean verifyGrades() {
        // code to verify Grades before announcement

        return true;
    }
}
```

SonarLint: Current file Report Taint vulnerabilities Log

Found 2 issues in 1 file

- GradesAnnouncementEmailMessage.java (2 issues)
 - Remove this unused method parameter "placeHolders".
 - Remove this method and declare a constant for this value.

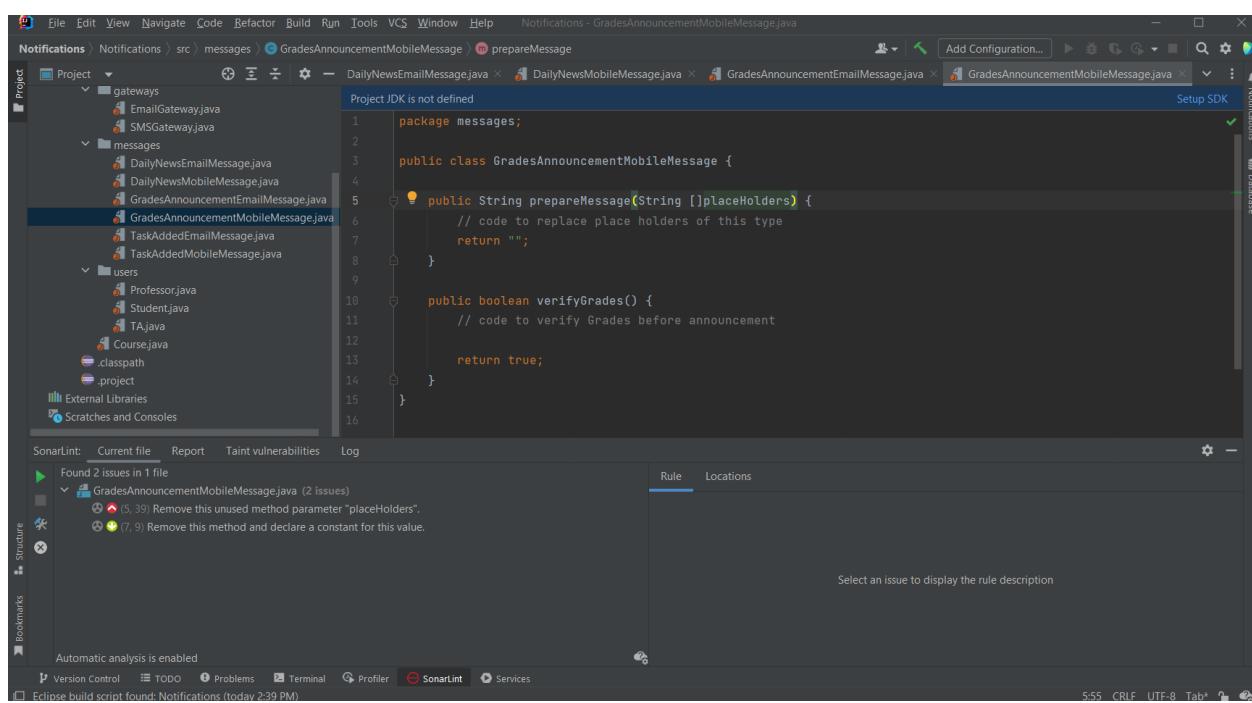
Select an issue to display the rule description

Automatic analysis is enabled

Version Control TODO Problems Terminal Profiler SonarLint Services

Eclipse build script found: Notifications (today 2:39 PM)

5:55 CRLF UTF-8 Tab*



Notifications > Notifications > src > messages > GradesAnnouncementMobileMessage > prepareMessage

Project JDK is not defined

```
package messages;

public class GradesAnnouncementMobileMessage {

    public String prepareMessage(String []placeHolders) {
        // code to replace place holders of this type
        return "";
    }

    public boolean verifyGrades() {
        // code to verify Grades before announcement

        return true;
    }
}
```

SonarLint: Current file Report Taint vulnerabilities Log

Found 2 issues in 1 file

- GradesAnnouncementMobileMessage.java (2 issues)
 - Remove this unused method parameter "placeHolders".
 - Remove this method and declare a constant for this value.

Select an issue to display the rule description

Automatic analysis is enabled

Version Control TODO Problems Terminal Profiler SonarLint Services

Eclipse build script found: Notifications (today 2:39 PM)

5:55 CRLF UTF-8 Tab*

SonarLint: Current file Report Taint vulnerabilities Log

Found 2 issues in 1 file

- TaskAddedEmailMessage.java (2 issues)
 - (5, 39) Remove this unused method parameter "placeHolders".
 - (8, 9) Remove this method and declare a constant for this value.

Select an issue to display the rule description

Automatic analysis is enabled

Version Control TODO Problems Terminal Profiler SonarLint Services

Eclipse build script found: Notifications (today 2:39 PM)

13:51 CRLF UTF-8 Tab*

```
package messages;

public class TaskAddedEmailMessage {
    public String prepareMessage(String []placeHolders) {
        // code to replace place holders of this type
        return "";
    }

    public void addTeamDescription() {
        //DO NOTHING BECAUSE THIS CODE IS SKELETAL
    }
}
```

SonarLint: Current file Report Taint vulnerabilities Log

Found 2 issues in 1 file

- TaskAddedMobileMessage.java (2 issues)
 - (5, 39) Remove this unused method parameter "placeHolders".
 - (7, 9) Remove this method and declare a constant for this value.

Select an issue to display the rule description

Automatic analysis is enabled

Version Control TODO Problems Terminal Profiler SonarLint Services

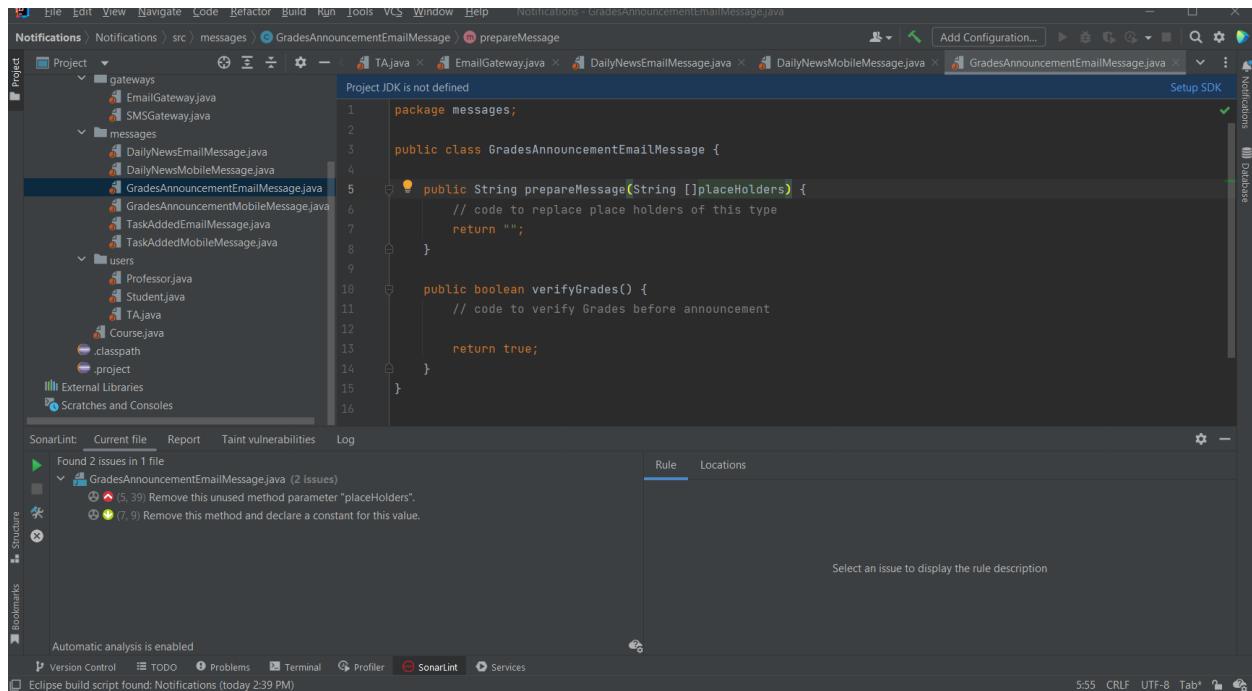
Eclipse build script found: Notifications (today 2:39 PM)

12:51 CRLF UTF-8 Tab*

```
package messages;

public class TaskAddedMobileMessage {
    public String prepareMessage(String []placeHolders) {
        // code to replace place holders of this type
        return "";
    }

    public void addTeamDescription() {
        //DO NOTHING BECAUSE THIS CODE IS SKELETAL
    }
}
```



```
package messages;

public class GradesAnnouncementEmailMessage {

    public String prepareMessage(String []placeHolders) {
        // code to replace place holders of this type
        return "";
    }

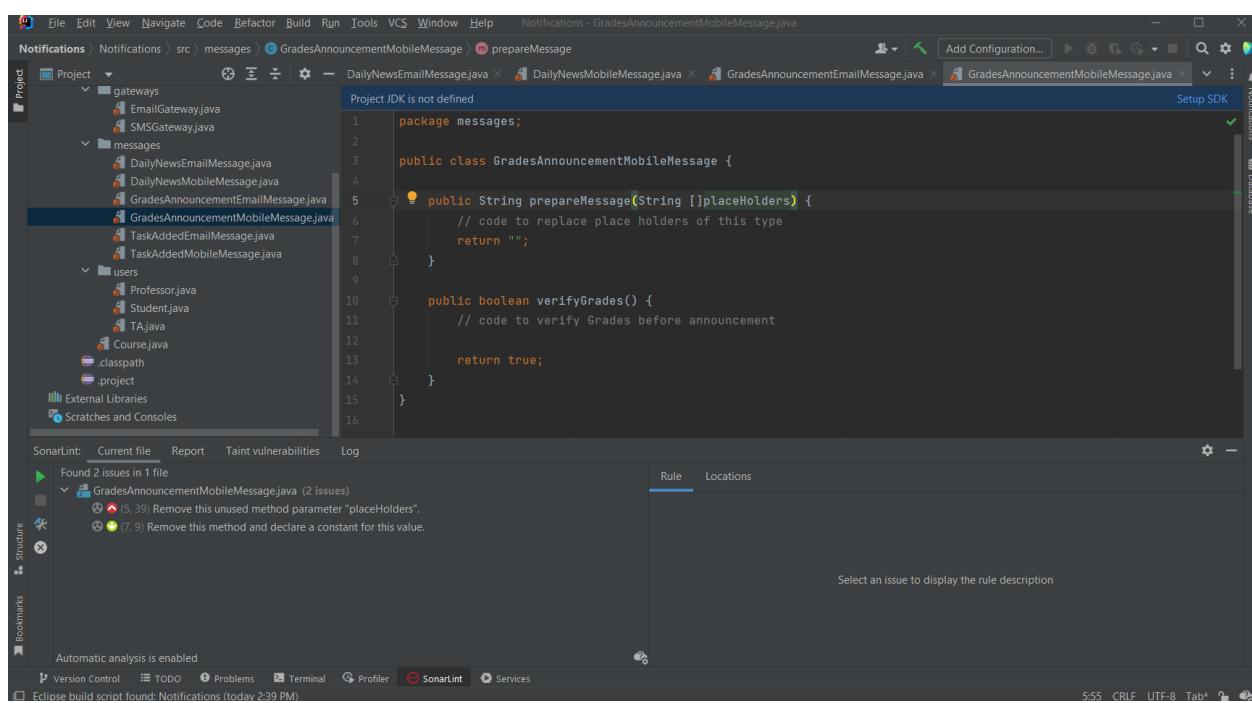
    public boolean verifyGrades() {
        // code to verify Grades before announcement

        return true;
    }
}
```

Found 2 issues in 1 file

- GradesAnnouncementEmailMessage.java (2 issues)
 - Remove this unused method parameter "placeHolders".
 - Remove this method and declare a constant for this value.

Select an issue to display the rule description



```
package messages;

public class GradesAnnouncementMobileMessage {

    public String prepareMessage(String []placeHolders) {
        // code to replace place holders of this type
        return "";
    }

    public boolean verifyGrades() {
        // code to verify Grades before announcement

        return true;
    }
}
```

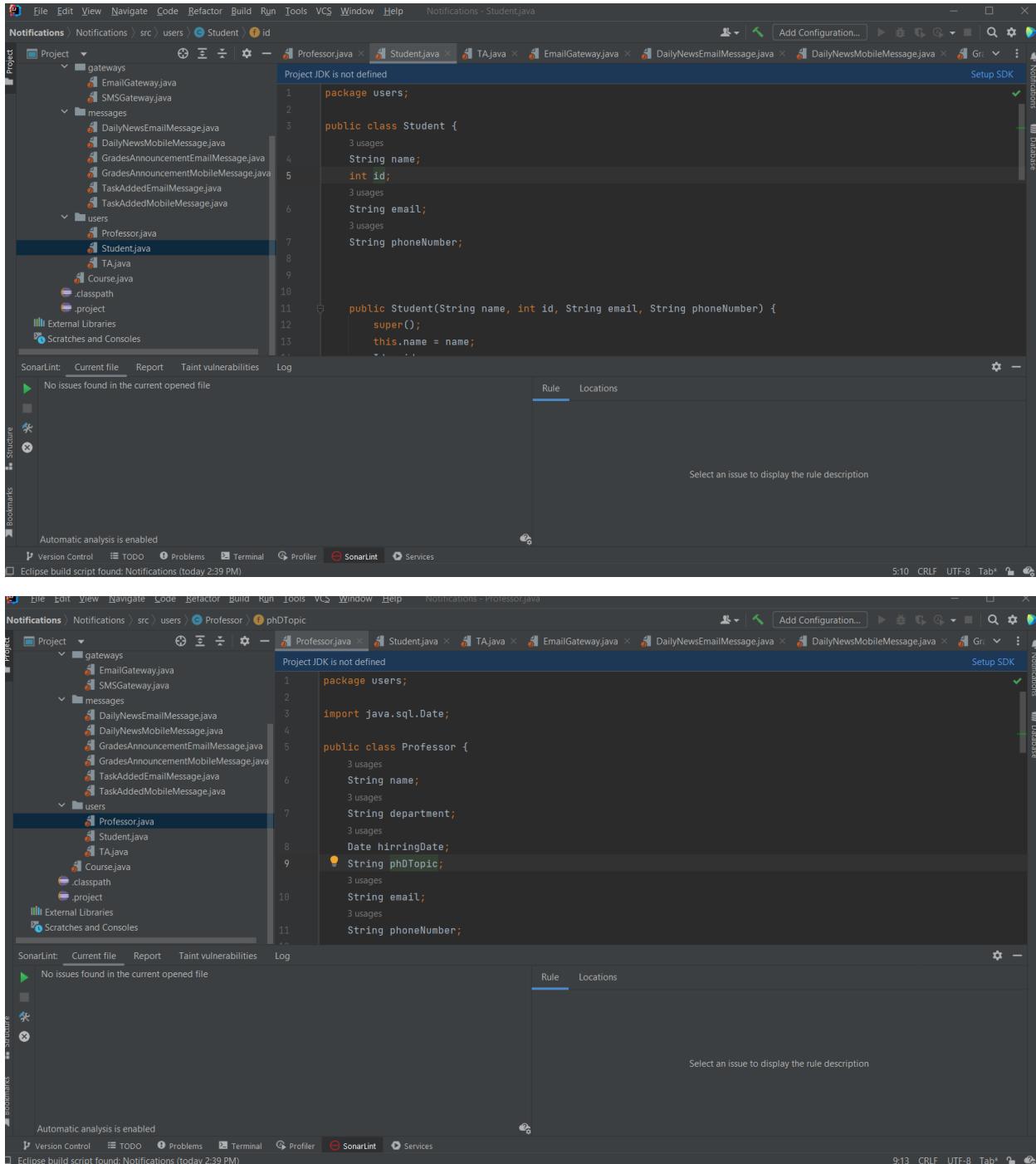
Found 2 issues in 1 file

- GradesAnnouncementMobileMessage.java (2 issues)
 - Remove this unused method parameter "placeHolders".
 - Remove this method and declare a constant for this value.

Select an issue to display the rule description

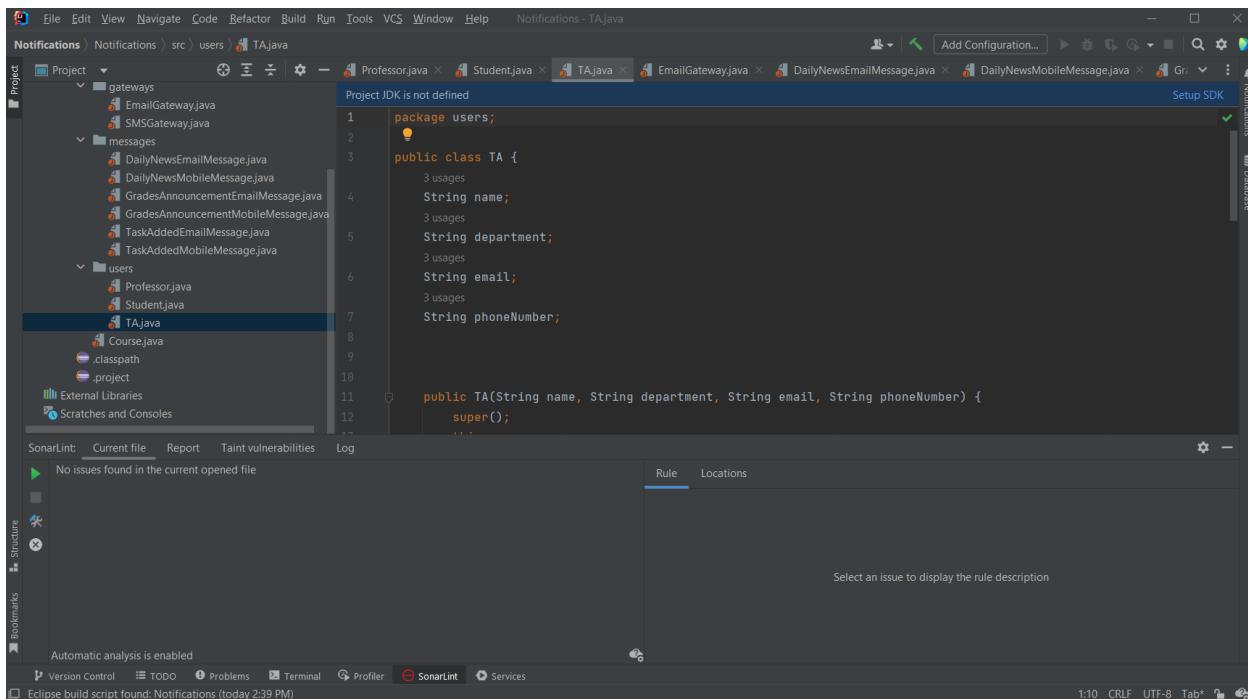
2.3. users Package

- Fixed the package name by making the first letter small (users).
- Fixed the renaming field issue by making the first letter small (id, phDTTopic, setDepartment).



The screenshot shows two Java code editors in an IDE. The top editor displays `Student.java` with the following code:package users;
public class Student {
 3 usages
 String name;
 int id;
 3 usages
 String email;
 3 usages
 String phoneNumber;

 public Student(String name, int id, String email, String phoneNumber) {
 super();
 this.name = name;
 }
}The bottom editor displays `Professor.java` with the following code:package users;
import java.sql.Date;
public class Professor {
 3 usages
 String name;
 3 usages
 String department;
 3 usages
 Date hiringDate;
 String phDTTopic;
 3 usages
 String email;
 3 usages
 String phoneNumber;Both code editors show a warning message: "Project JDK is not defined". The IDE interface includes a navigation bar, toolbars, and various project and file management panels.



```

package users;

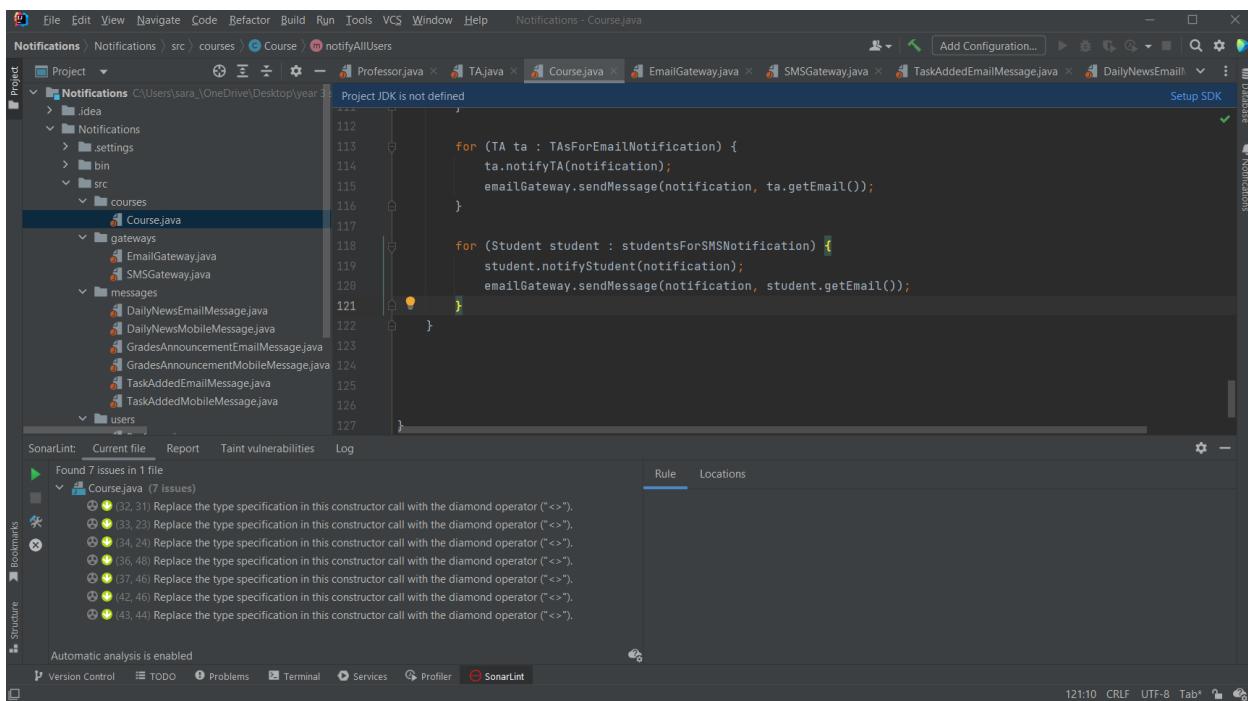
public class TA {
    String name;
    String department;
    String email;
    String phoneNumber;

    public TA(String name, String department, String email, String phoneNumber) {
        super();
    }
}

```

2.4. courses Package

- Fixed the package issue by creating a new package (courses) and moving the .java related file (course) inside it.
- Fixed the imports issue by renaming the imported packages as their directories.
- Replace the type specification issue has not been resolved yet.



```

for (TA ta : TAsForEmailNotification) {
    ta.notifyTA(notification);
    emailGateway.sendMessage(notification, ta.getEmail());
}

for (Student student : studentsForSMSNotification) {
    student.notifyStudent(notification);
    emailGateway.sendMessage(notification, student.getEmail());
}

```

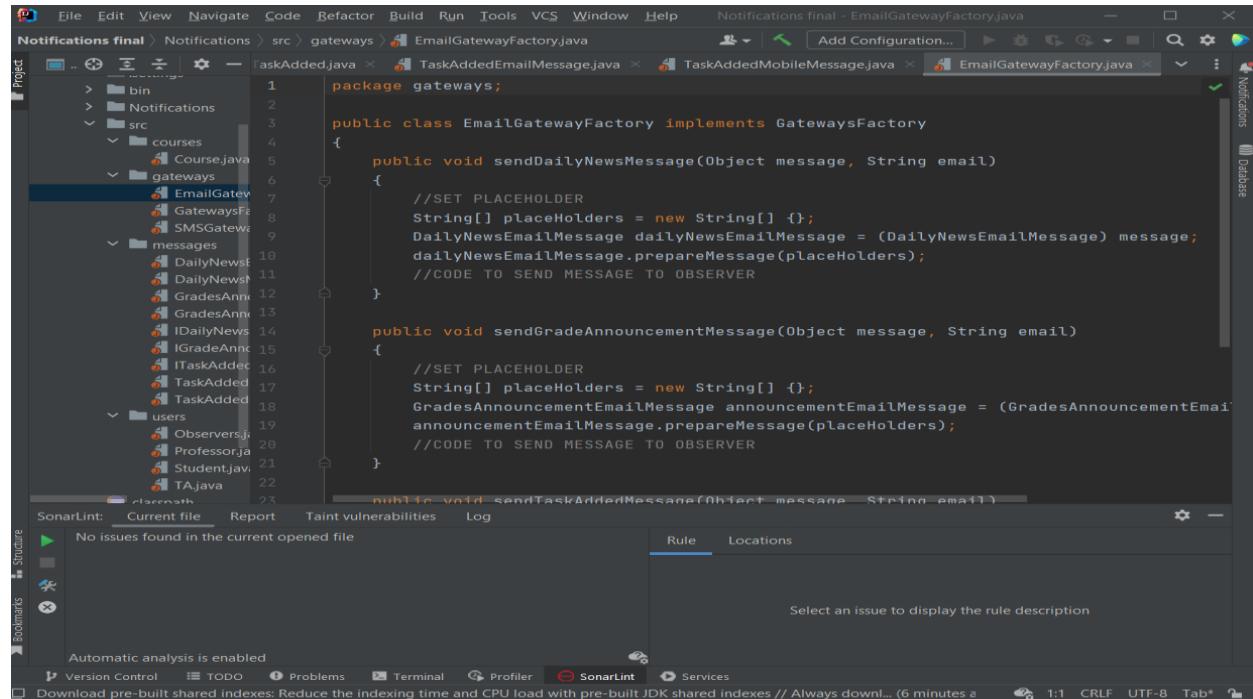
Found 7 issues in 1 file

- (32, 31) Replace the type specification in this constructor call with the diamond operator ("<>").
- (33, 23) Replace the type specification in this constructor call with the diamond operator ("<>").
- (34, 24) Replace the type specification in this constructor call with the diamond operator ("<>").
- (36, 48) Replace the type specification in this constructor call with the diamond operator ("<>").
- (37, 46) Replace the type specification in this constructor call with the diamond operator ("<>").
- (42, 46) Replace the type specification in this constructor call with the diamond operator ("<>").
- (43, 44) Replace the type specification in this constructor call with the diamond operator ("<>").

3- Static Analysis Report after applying Design Patterns

3.1- gateways Package

- Added factory pattern since we have 2 types of gateways (Email and SMS) that are later used in the messages package.

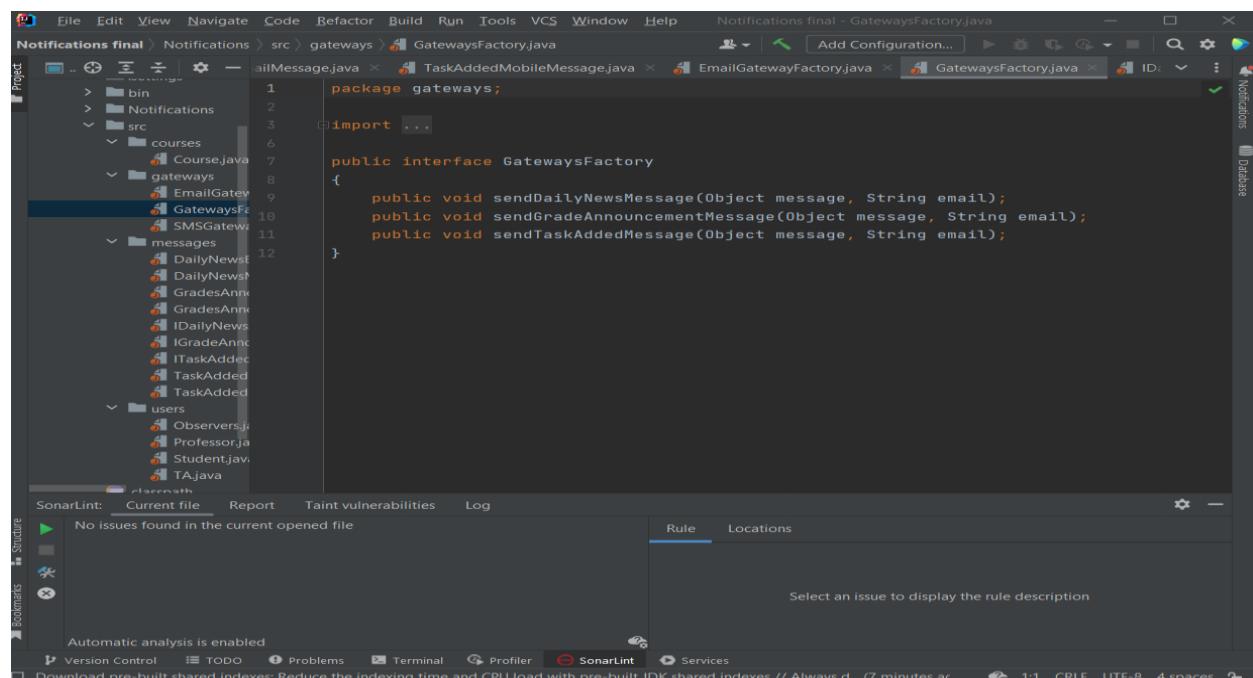


```
package gateways;

public class EmailGatewayFactory implements GatewaysFactory
{
    public void sendDailyNewsMessage(Object message, String email)
    {
        //SET PLACEHOLDER
        String[] placeHolders = new String[] {};
        DailyNewsEmailMessage dailyNewsEmailMessage = (DailyNewsEmailMessage) message;
        dailyNewsEmailMessage.prepareMessage(placeHolders);
        //CODE TO SEND MESSAGE TO OBSERVER
    }

    public void sendGradeAnnouncementMessage(Object message, String email)
    {
        //SET PLACEHOLDER
        String[] placeHolders = new String[] {};
        GradesAnnouncementEmailMessage announcementEmailMessage = (GradesAnnouncementEmailMessage) message;
        announcementEmailMessage.prepareMessage(placeHolders);
        //CODE TO SEND MESSAGE TO OBSERVER
    }

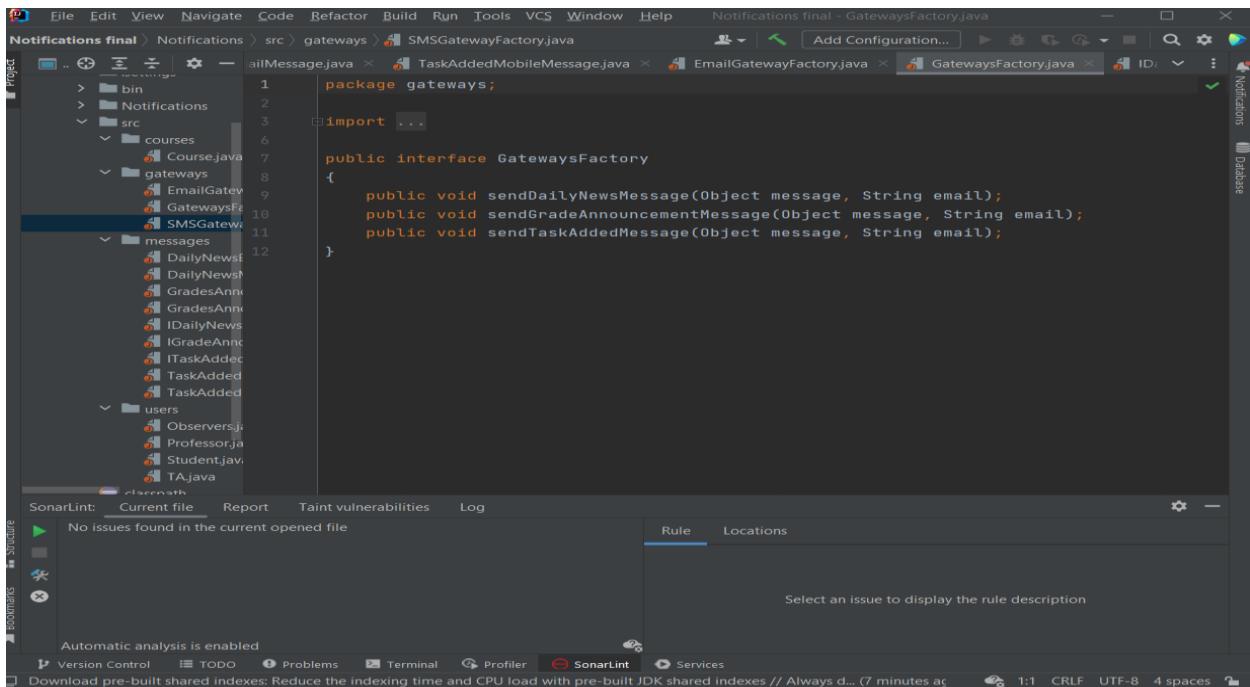
    public void sendTaskAddedMessage(Object message, String email)
    {
    }
}
```



```
package gateways;

import ...

public interface GatewaysFactory
{
    public void sendDailyNewsMessage(Object message, String email);
    public void sendGradeAnnouncementMessage(Object message, String email);
    public void sendTaskAddedMessage(Object message, String email);
}
```



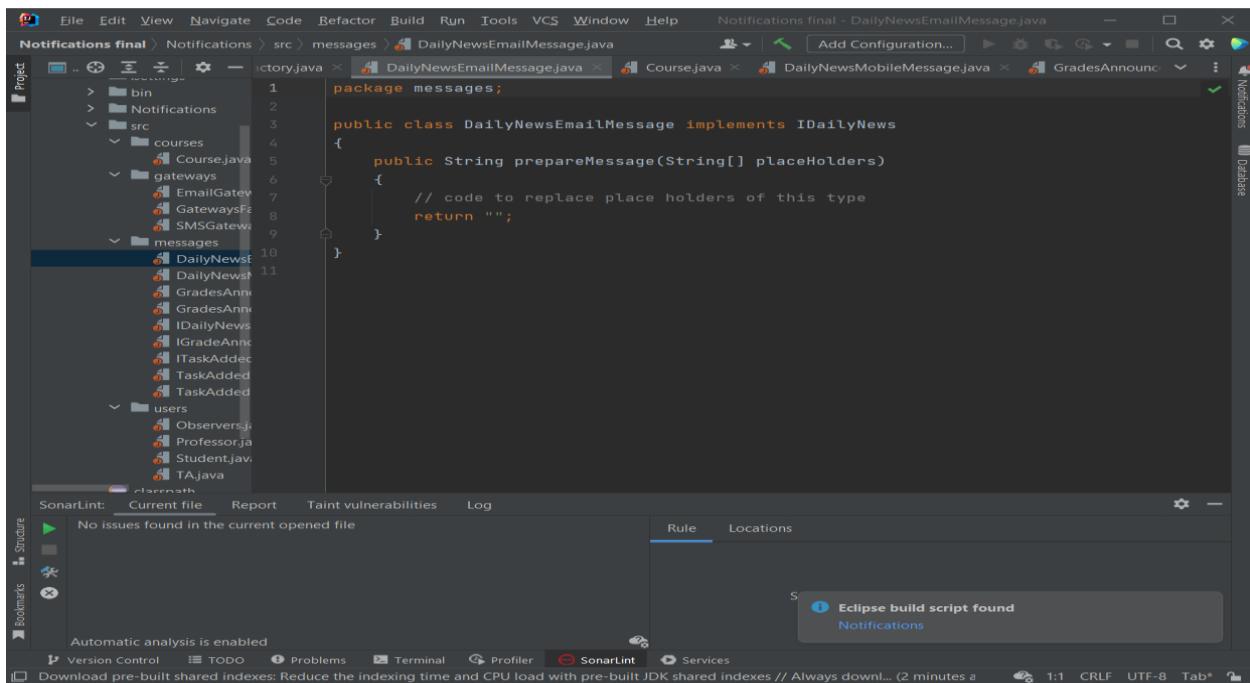
```

1 package gateways;
2
3 import ...
4
5 public interface GatewayFactory
6 {
7     public void sendDailyNewsMessage(Object message, String email);
8     public void sendGradeAnnouncementMessage(Object message, String email);
9     public void sendTaskAddedMessage(Object message, String email);
10}
11
12

```

3.2- messages Package

- Added a IDailyNews Interface where the DailyNewsSMSmessages and DailyNewsEmailMessage classes extend it
- Added a ITaskAdded Interface where the TaskAddedEmailMessage and TaskAddedMobileMessage classes extend it.
- Added a IDailyAnnouncement Interface where the DailyAnnouncementMobileMessage and DailyAnnouncementEmailMessage classes extend it.



```

1 package messages;
2
3 public class DailyNewsEmailMessage implements IDailyNews
4 {
5     public String prepareMessage(String[] placeHolders)
6     {
7         // code to replace place holders of this type
8         return "";
9     }
10}
11
12

```

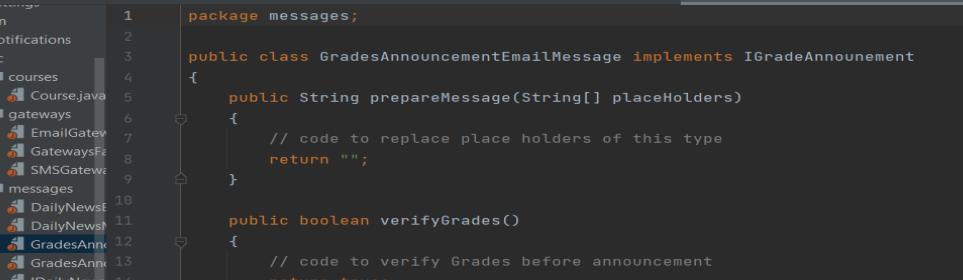
A tooltip message 'Eclipse build script found' is visible in the bottom right corner of the IDE interface.

The screenshot shows the Android Studio interface with the following details:

- Project Tree:** The project is named "Notifications final". The "src" directory contains packages for "courses", "gateways", "messages", and "users". The "messages" package contains classes for "DailyNewsEmailMessage", "Course", "DailyNewsMobileMessage", "GradesAnnouncement", "GradeAnnouncement", "IDailyNews", "IGradeAnnouncement", "ITaskAdded", "TaskAdded", and "Task".
- Code Editor:** The file "DailyNewsMobileMessage.java" is open, showing the following code:

```
package messages;

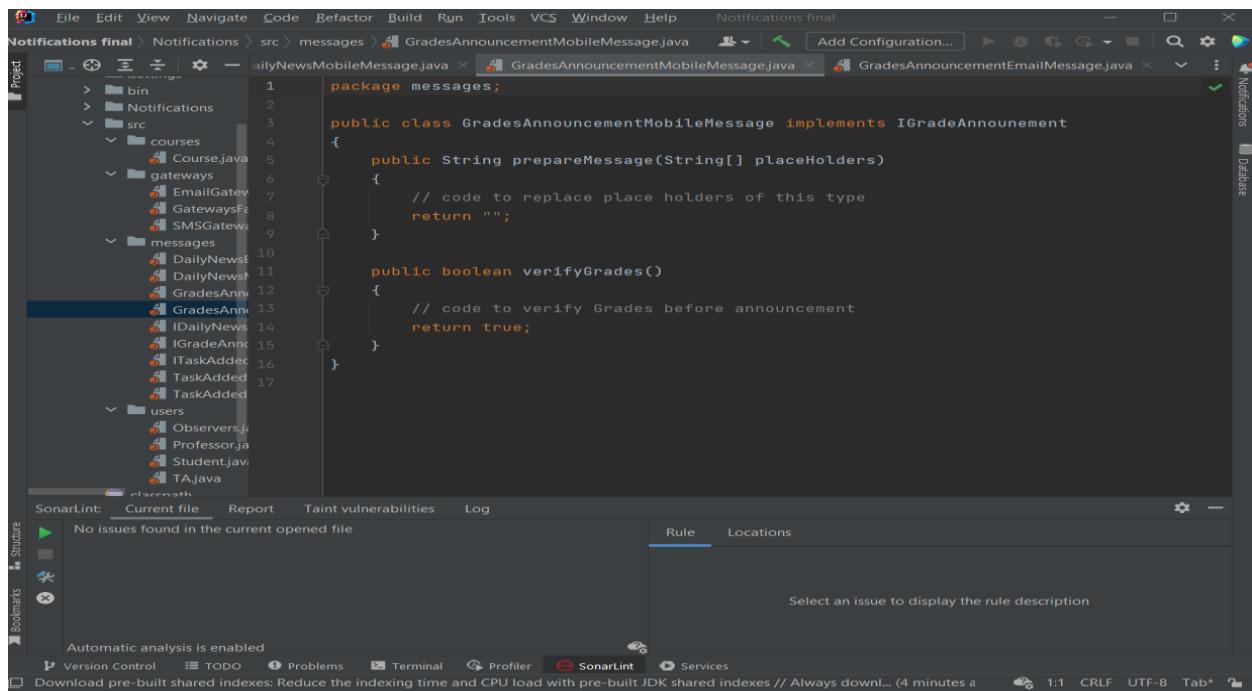
public class DailyNewsMobileMessage implements IDailyNews
{
    public String prepareMessage(String[] placeHolders)
    {
        // code to replace place holders of this type
        return "";
    }
}
```



```
package messages;

public class GradesAnnouncementEmailMessage implements IGradeAnnouncement
{
    public String prepareMessage(String[] placeHolders)
    {
        // code to replace place holders of this type
        return "";
    }

    public boolean verifyGrades()
    {
        // code to verify Grades before announcement
        return true;
    }
}
```



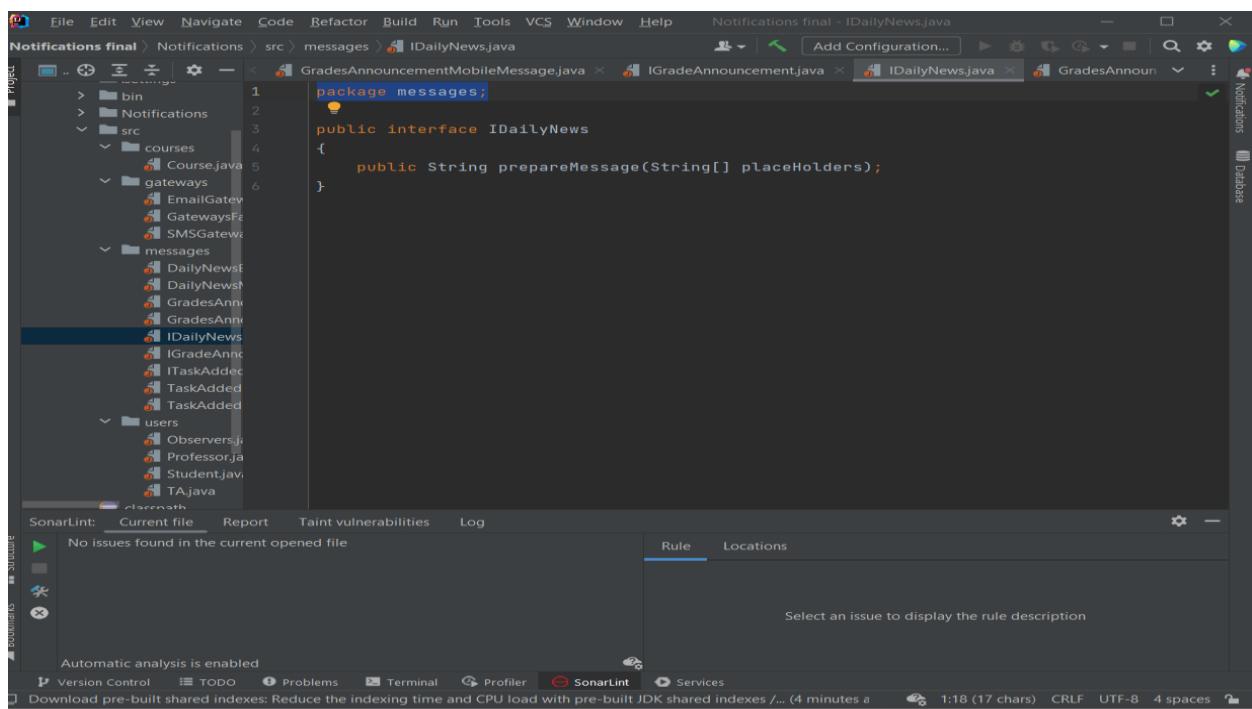
```
package messages;

public class GradesAnnouncementMobileMessage implements IGradeAnnouncement
{
    public String prepareMessage(String[] placeHolders)
    {
        // code to replace place holders of this type
        return "";
    }

    public boolean verifyGrades()
    {
        // code to verify Grades before announcement
        return true;
    }
}
```

Automatic analysis is enabled

Download pre-built shared indexes: Reduce the indexing time and CPU load with pre-built JDK shared indexes // Always down... (4 minutes a

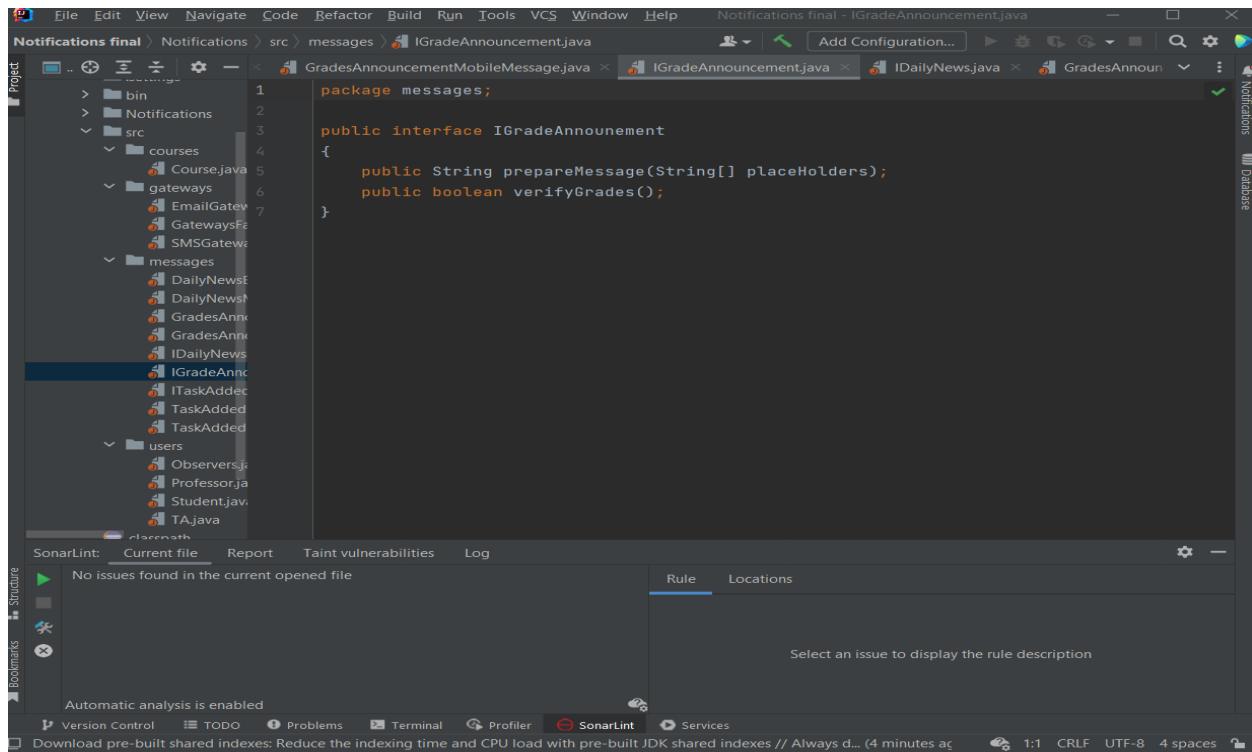


```
package messages;

public interface IDailyNews
{
    public String prepareMessage(String[] placeHolders);
}
```

Automatic analysis is enabled

Download pre-built shared indexes: Reduce the indexing time and CPU load with pre-built JDK shared indexes /... (4 minutes a



File Edit View Navigate Code Refactor Build Run Tools VCS Window Help Notifications final - IGradeAnnouncement.java

Notifications final > Notifications > src > messages > IGradeAnnouncement.java

Project

```
1 package messages;
2
3 public interface IGradeAnnouncement
4 {
5     public String prepareMessage(String[] placeHolders);
6     public boolean verifyGrades();
7 }
```

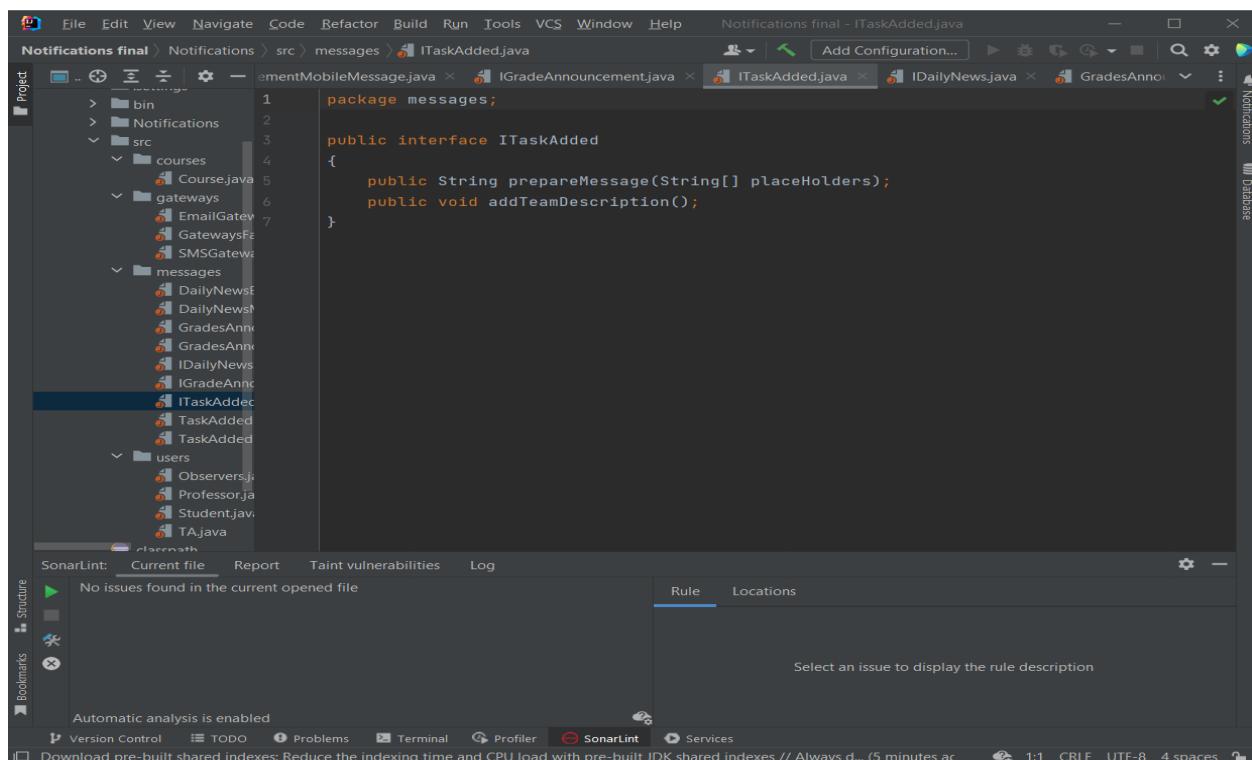
SonarLint: Current file Report Taint vulnerabilities Log

Automatic analysis is enabled

Download pre-built shared indexes: Reduce the indexing time and CPU load with pre-built JDK shared indexes // Always d... (4 minutes ago)

1:1 CRLF UTF-8 4 spaces

This screenshot shows the IntelliJ IDEA interface for the 'Notifications final' project. The 'messages' package is selected in the project tree. The 'IGradeAnnouncement.java' file is open in the editor, displaying its code. The SonarLint tool is active, showing no issues found in the current file. The status bar at the bottom indicates an automatic analysis is enabled and provides download instructions for shared indexes.



File Edit View Navigate Code Refactor Build Run Tools VCS Window Help Notifications final - ITaskAdded.java

Notifications final > Notifications > src > messages > ITaskAdded.java

Project

```
1 package messages;
2
3 public interface ITaskAdded
4 {
5     public String prepareMessage(String[] placeHolders);
6     public void addTeamDescription();
7 }
```

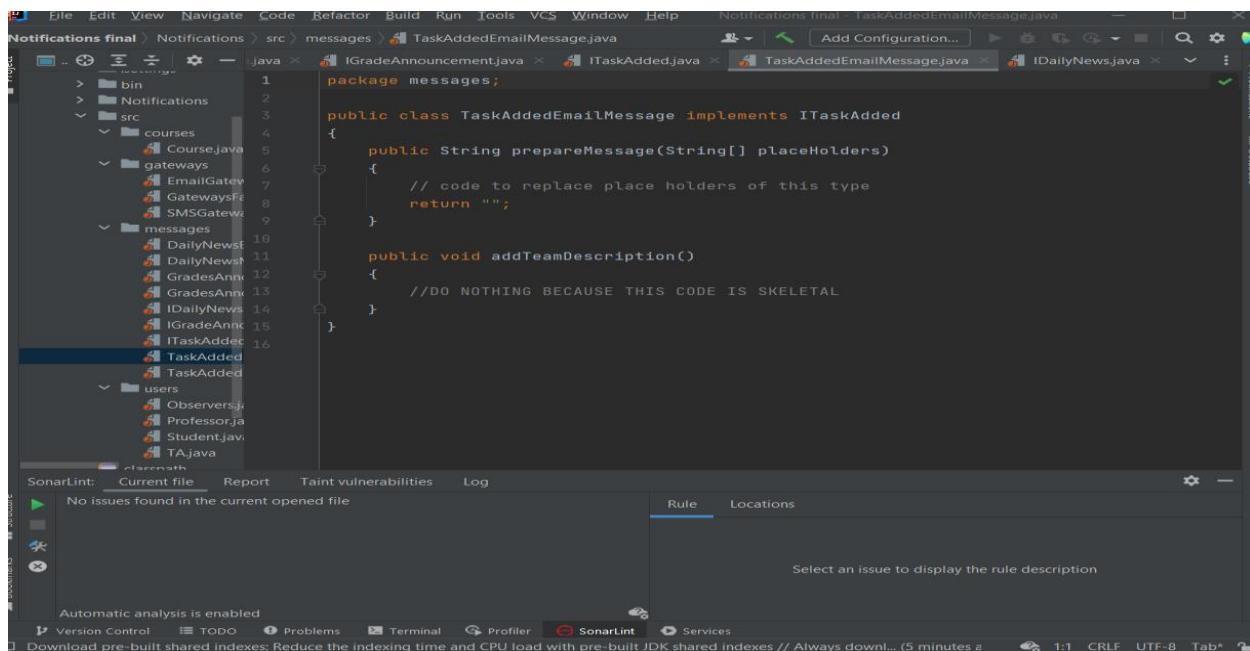
SonarLint: Current file Report Taint vulnerabilities Log

Automatic analysis is enabled

Download pre-built shared indexes: Reduce the indexing time and CPU load with pre-built JDK shared indexes // Always d... (5 minutes ago)

1:1 CRLF UTF-8 4 spaces

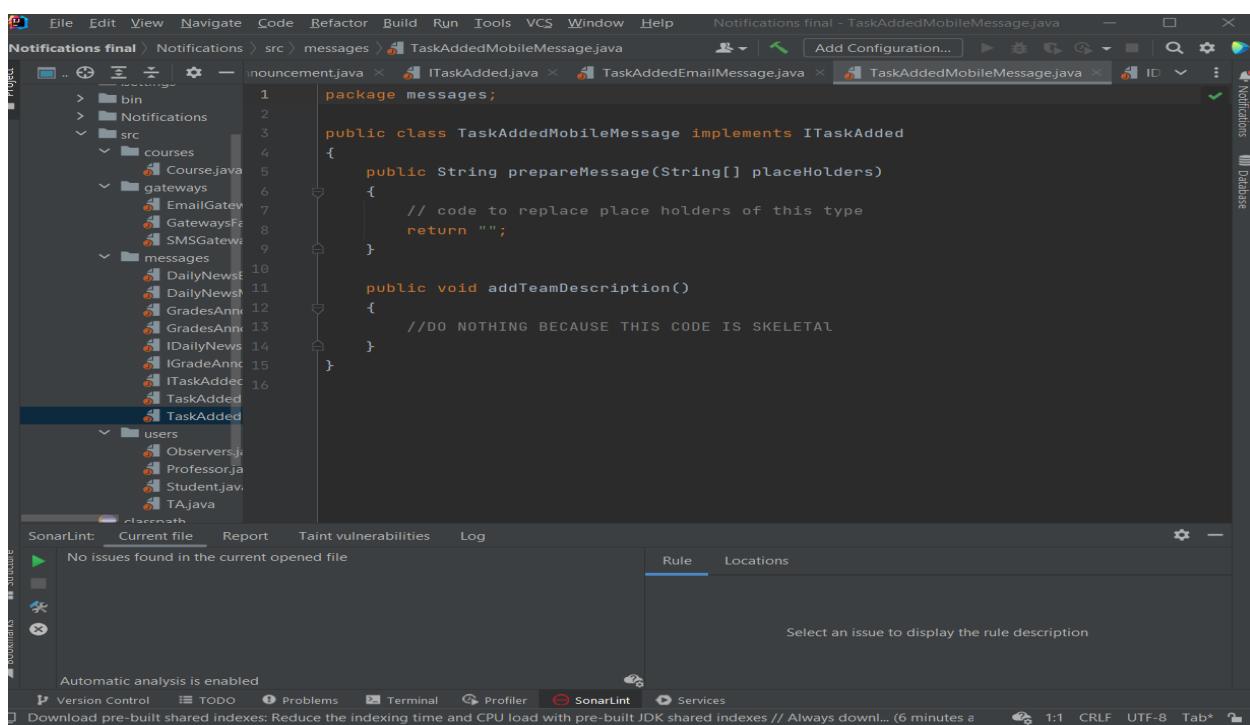
This screenshot shows the IntelliJ IDEA interface for the 'Notifications final' project. The 'messages' package is selected in the project tree. The 'ITaskAdded.java' file is open in the editor, displaying its code. The SonarLint tool is active, showing no issues found in the current file. The status bar at the bottom indicates an automatic analysis is enabled and provides download instructions for shared indexes.



```
package messages;

public class TaskAddedEmailMessage implements ITaskAdded
{
    public String prepareMessage(String[] placeHolders)
    {
        // code to replace place holders of this type
        return "";
    }

    public void addTeamDescription()
    {
        //DO NOTHING BECAUSE THIS CODE IS SKELETAL
    }
}
```



```
package messages;

public class TaskAddedMobileMessage implements ITaskAdded
{
    public String prepareMessage(String[] placeHolders)
    {
        // code to replace place holders of this type
        return "";
    }

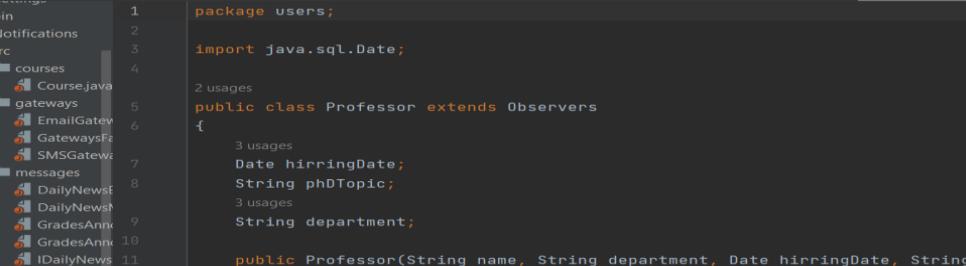
    public void addTeamDescription()
    {
        //DO NOTHING BECAUSE THIS CODE IS SKELETAL
    }
}
```

3.3- users Package

- Created an observer pattern where the users are the observers and the course is the subject.
 - Classes Professor, Student, and TA extend the Observers interface.

```
File Edit View Navigate Code Refactor Build Run Tools VCS Window Help Notifications final - Observers.java
Notifications final > Notifications > src > users > Observers > Observers.java
Notifications.java EmailGatewayFactory.java GatewaysFactory.java Observers.java IDailyNews.java
Project: Notifications final
src
  - bin
  - Notifications
  - courses
    - Course.java
  - gateways
    - EmailGateway.java
    - EmailGatewayFactory.java
    - GatewaysFactory.java
    - SMSGateway.java
  - messages
    - DailyNews.java
    - DailyNewsEvent.java
    - GradesAnnouncement.java
    - GradesAnnouncement.java
    - IDailyNews.java
    - IGradeAnnouncement.java
    - ITaskAdded.java
    - TaskAdded.java
    - TaskAddedEvent.java
  - users
    - Observers.java
    - Professor.java
    - Student.java
    - TA.java
  - classpath
  - SonarLint
  - Current file
  - Report
  - Taint vulnerabilities
  - Log
  - Version Control
  - TODO
  - Problems
  - Terminal
  - Profiler
  - SonarLint
  - Services
  - Database

Notifications.java (31 lines)
1 package notifications;
2
3 import java.util.ArrayList;
4 import java.util.List;
5
6 public class Observers {
7
8     private String name;
9     private String email;
10    private String phoneNumber;
11
12    protected Observers(String name, String email, String phoneNumber) {
13
14        this.name = name;
15        this.email = email;
16        this.phoneNumber = phoneNumber;
17
18    }
19
20    public String getEmail() { return email; }
21
22    public void setEmail(String email) { this.email = email; }
23
24    public String getPhoneNumber() { return phoneNumber; }
25
26    public void setPhoneNumber(String phoneNumber) { this.phoneNumber = phoneNumber; }
27
28
29
30
31 }
```



```
package users;

import java.sql.Date;

public class Professor extends Observers
{
    Date hirringDate;
    String phDTopic;
    String department;

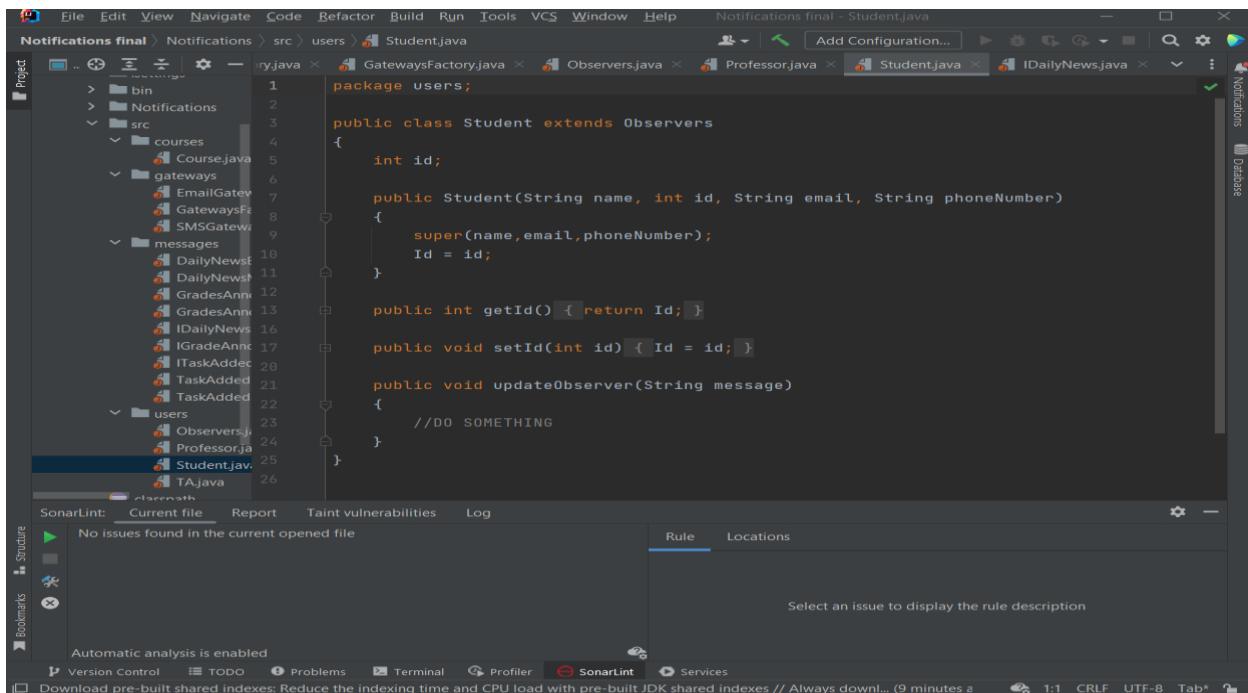
    public Professor(String name, String department, Date hirringDate, String phDTopic, String email, String phoneNumber)
    {
        super(name, email, phoneNumber);
        this.department = department;
        this.hirringDate = hirringDate;
        PhDTopic = phDTopic;
    }

    public String getDepartment() { return department; }
}
```

SonarLint: Current file Report Taint vulnerabilities Log

No issues found in the current opened file

Select an issue to display the rule description



Notifications final - Student.java

```
1 package users;
2
3 public class Student extends Observers
4 {
5     int id;
6
7     public Student(String name, int id, String email, String phoneNumber)
8     {
9         super(name,email,phoneNumber);
10        Id = id;
11    }
12
13    public int getId() { return Id; }
14
15    public void setId(int id) { Id = id; }
16
17    public void updateObserver(String message)
18    {
19        //DO SOMETHING
20    }
21
22 }
23
24
25
26
```

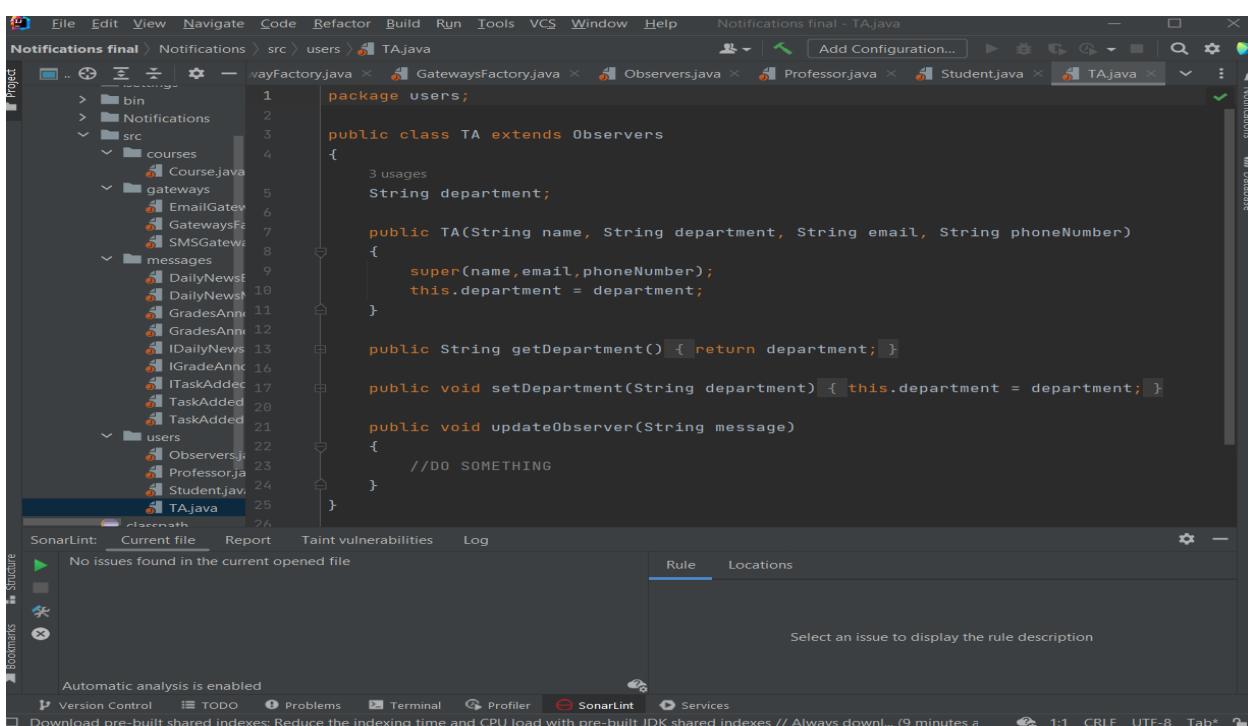
Automatic analysis is enabled

SonarLint Current file Report Taint vulnerabilities Log

Select an issue to display the rule description

Version Control TODO Problems Terminal Profiler SonarLint Services

Download pre-built shared indexes: Reduce the indexing time and CPU load with pre-built JDK shared indexes // Always download (9 minutes a 1:1 CRLF UTF-8 Tab*



Notifications final - TA.java

```
1 package users;
2
3 public class TA extends Observers
4 {
5     String department;
6
7     public TA(String name, String department, String email, String phoneNumber)
8     {
9         super(name,email,phoneNumber);
10        this.department = department;
11    }
12
13    public String getDepartment() { return department; }
14
15    public void setDepartment(String department) { this.department = department; }
16
17    public void updateObserver(String message)
18    {
19        //DO SOMETHING
20    }
21
22 }
23
24
25
26
```

Automatic analysis is enabled

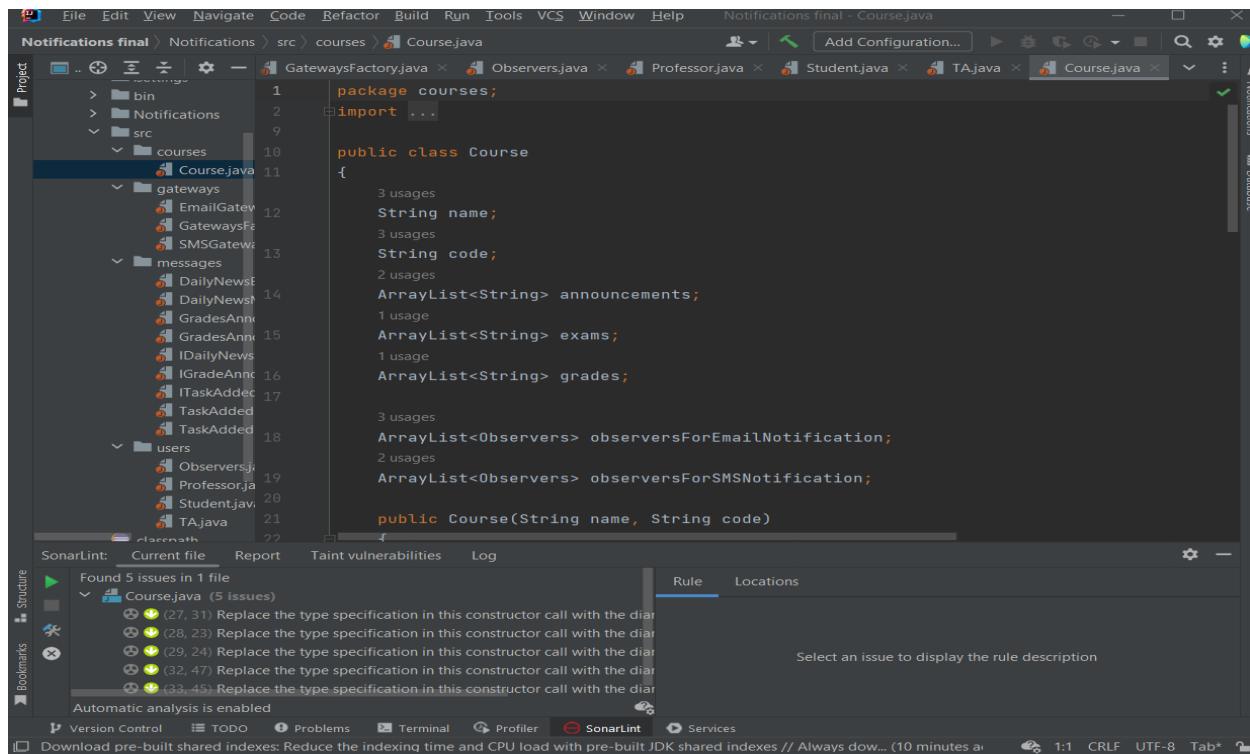
SonarLint Current file Report Taint vulnerabilities Log

Select an issue to display the rule description

Version Control TODO Problems Terminal Profiler SonarLint Services

Download pre-built shared indexes: Reduce the indexing time and CPU load with pre-built JDK shared indexes // Always download (9 minutes a 1:1 CRLF UTF-8 Tab*

3.4- course Package



```
package courses;
import ...

public class Course
{
    String name;
    String code;
    ArrayList<String> announcements;
    ArrayList<String> exams;
    ArrayList<String> grades;

    ArrayList<Observers> observersForEmailNotification;
    ArrayList<Observers> observersForSMSNotification;

    public Course(String name, String code)
    {
    }
}
```

SonarLint: Current file Report Taint vulnerabilities Log

Found 5 issues in 1 file

Course.java (5 issues)

- (27, 31) Replace the type specification in this constructor call with the diamond operator
- (28, 23) Replace the type specification in this constructor call with the diamond operator
- (29, 24) Replace the type specification in this constructor call with the diamond operator
- (32, 47) Replace the type specification in this constructor call with the diamond operator
- (33, 45) Replace the type specification in this constructor call with the diamond operator

Select an issue to display the rule description

4- Static Analysis Report snapshots using SonarQube

Initial version



src/Course.java

1 / 51 issues 0h 32min effort

Move this file to a named package. Why is this an issue? 9 minutes ago ▾ L1 % T-
Code Smell Minor Open Not assigned 10min effort Comment convention

Rename this field "TAsForEmailNotification" to match the regular expression "[a-zA-Z0-9]". Why is this an issue? 9 minutes ago ▾ L20 % T-
Code Smell Minor Open Not assigned 2min effort Comment convention

Rename this field "TAsForSMSNotification" to match the regular expression "[a-zA-Z0-9]". Why is this an issue? 9 minutes ago ▾ L21 % T-
Code Smell Minor Open Not assigned 2min effort Comment convention

Replace the type specification in this constructor call with the diamond operator ("<>"). Why is this an issue? 9 minutes ago ▾ L31 % T-
(sonar.java.source not set. Assuming 7 or greater.) Code Smell Minor Open Not assigned 1min effort Comment clumsy

Replace the type specification in this constructor call with the diamond operator ("<>"). Why is this an issue? 9 minutes ago ▾ L32 % T-
(sonar.java.source not set. Assuming 7 or greater.) Code Smell Minor Open Not assigned 1min effort Comment clumsy

Replace the type specification in this constructor call with the diamond operator ("<>"). Why is this an issue? 9 minutes ago ▾ L33 % T-
(sonar.java.source not set. Assuming 7 or greater.) Code Smell Minor Open Not assigned 1min effort Comment clumsy

Replace the type specification in this constructor call with the diamond operator ("<>"). Why is this an issue? 9 minutes ago ▾ L35 % T-
(sonar.java.source not set. Assuming 7 or greater.) Code Smell Minor Open Not assigned 1min effort Comment clumsy

Replace the type specification in this constructor call with the diamond operator ("<>"). Why is this an issue? 9 minutes ago ▾ L36 % T-
(sonar.java.source not set. Assuming 7 or greater.) Code Smell Minor Open Not assigned 1min effort Comment clumsy

Replace the type specification in this constructor call with the diamond operator ("<>"). Why is this an issue? 9 minutes ago ▾ L38 % T-
(sonar.java.source not set. Assuming 7 or greater.) Code Smell Minor Open Not assigned 1min effort Comment clumsy

Replace the type specification in this constructor call with the diamond operator ("<>"). Why is this an issue? 9 minutes ago ▾ L39 % T-
(sonar.java.source not set. Assuming 7 or greater.) Code Smell Minor Open Not assigned 1min effort Comment clumsy

Replace the type specification in this constructor call with the diamond operator ("<>"). Why is this an issue? 9 minutes ago ▾ L41 % T-
(sonar.java.source not set. Assuming 7 or greater.) Code Smell Minor Open Not assigned 1min effort Comment clumsy

Replace the type specification in this constructor call with the diamond operator ("<>"). Why is this an issue? 9 minutes ago ▾ L42 % T-
(sonar.java.source not set. Assuming 7 or greater.) Code Smell Minor Open Not assigned 1min effort Comment clumsy

Rename this method name to match the regular expression "[a-zA-Z0-9]". Why is this an issue? 9 minutes ago ▾ L87 % T-
Code Smell Minor Open Not assigned 5min effort Comment convention



src/Gateways/EmailGateway.java

Rename this package name to match the regular expression "[a-zA-Z]+([a-zA-Z][a-zA-Z0-9_])+". Why is this an issue? 9 minutes ago ▾ L1 % T-
Code Smell Minor Open Not assigned 10min effort Comment convention

Remove this unused method parameter "user". Why is this an issue? 9 minutes ago ▾ L9 % T-
Code Smell Major Open Not assigned 5min effort Comment cert, unused

src/Gateways/SMSSGateway.java

Rename this package name to match the regular expression "[a-zA-Z]+([a-zA-Z][a-zA-Z0-9_])+". Why is this an issue? 9 minutes ago ▾ L1 % T-
Code Smell Minor Open Not assigned 10min effort Comment convention

Remove this unused method parameter "user". Why is this an issue? 9 minutes ago ▾ L9 % T-
Code Smell Major Open Not assigned 5min effort Comment cert, unused

src/Messages/DailyNewsEmailMessage.java

Rename this package name to match the regular expression "[a-zA-Z]+([a-zA-Z][a-zA-Z0-9_])+". Why is this an issue? 9 minutes ago ▾ L1 % T-
Code Smell Minor Open Not assigned 10min effort Comment convention

Remove this unused method parameter "placeHolders". Why is this an issue? 9 minutes ago ▾ L5 % T-
Code Smell Major Open Not assigned 5min effort Comment cert, unused

Move the array designators [] to the type. Why is this an issue? 9 minutes ago ▾ L5 % T-
Code Smell Minor Open Not assigned 5min effort Comment convention

Remove this method and declare a constant for this value. Why is this an issue? 9 minutes ago ▾ L7 % T-
Code Smell Minor Open Not assigned 5min effort Comment confusing

src/Messages/DailyNewsMobileMessage.java

Rename this package name to match the regular expression "[a-zA-Z]+([a-zA-Z][a-zA-Z0-9_])+". Why is this an issue? 9 minutes ago ▾ L1 % T-
Code Smell Minor Open Not assigned 10min effort Comment convention

Remove this unused method parameter "placeHolders". Why is this an issue? 9 minutes ago ▾ L5 % T-
Code Smell Major Open Not assigned 5min effort Comment cert, unused

Move the array designators [] to the type. Why is this an issue? 9 minutes ago ▾ L5 % T-
Code Smell Minor Open Not assigned 5min effort Comment convention

Remove this method and declare a constant for this value. Why is this an issue? 9 minutes ago ▾ L7 % T-
Code Smell Minor Open Not assigned 5min effort Comment confusing

src/Messages/GradesAnnouncementEmailMessage.java	
<input type="checkbox"/> Rename this package name to match the regular expression '^[a-z_]+([a-z_][a-z0-9_])*\$'.	Why is this an issue? 9 minutes ago L1 % T Code Smell Minor Open Not assigned 10min effort Comment
<input type="checkbox"/> Remove this unused method parameter "placeHolders".	Why is this an issue? 9 minutes ago L5 % T Code Smell Major Open Not assigned 5min effort Comment
<input type="checkbox"/> Move the array designators [] to the type.	Why is this an issue? 9 minutes ago L5 % T Code Smell Minor Open Not assigned 5min effort Comment
<input type="checkbox"/> Remove this method and declare a constant for this value.	Why is this an issue? 9 minutes ago L7 % T Code Smell Minor Open Not assigned 5min effort Comment
src/Messages/GradesAnnouncementMobileMessage.java	
<input type="checkbox"/> Rename this package name to match the regular expression '^[a-z_]+([a-z_][a-z0-9_])*\$'.	Why is this an issue? 9 minutes ago L1 % T Code Smell Minor Open Not assigned 10min effort Comment
<input type="checkbox"/> Remove this unused method parameter "placeHolders".	Why is this an issue? 9 minutes ago L5 % T Code Smell Major Open Not assigned 5min effort Comment
<input type="checkbox"/> Move the array designators [] to the type.	Why is this an issue? 9 minutes ago L5 % T Code Smell Minor Open Not assigned 5min effort Comment
<input type="checkbox"/> Remove this method and declare a constant for this value.	Why is this an issue? 9 minutes ago L7 % T Code Smell Minor Open Not assigned 5min effort Comment
src/Messages/TaskAddedEmailMessage.java	
<input type="checkbox"/> Rename this package name to match the regular expression '^[a-z_]+([a-z_][a-z0-9_])*\$'.	Why is this an issue? 9 minutes ago L1 % T Code Smell Minor Open Not assigned 10min effort Comment
<input type="checkbox"/> Remove this unused method parameter "placeHolders".	Why is this an issue? 9 minutes ago L5 % T Code Smell Major Open Not assigned 5min effort Comment
<input type="checkbox"/> Move the array designators [] to the type.	Why is this an issue? 9 minutes ago L5 % T Code Smell Minor Open Not assigned 5min effort Comment
<input type="checkbox"/> Remove this method and declare a constant for this value.	Why is this an issue? 9 minutes ago L8 % T Code Smell Minor Open Not assigned 5min effort Comment
<input type="checkbox"/> Add a nested comment explaining why this method is empty, throw an UnsupportedOperationException or complete the implementation.	Why is this an issue? 9 minutes ago L12 % T Code Smell Critical Open Not assigned 5min effort Comment
src/Messages/TaskAddedMobileMessage.java	
<input type="checkbox"/> Rename this package name to match the regular expression '^[a-z_]+([a-z_][a-z0-9_])*\$'.	Why is this an issue? 9 minutes ago L1 % T Code Smell Minor Open Not assigned 10min effort Comment
<input type="checkbox"/> Remove this unused method parameter "placeHolders".	Why is this an issue? 9 minutes ago L5 % T Code Smell Major Open Not assigned 5min effort Comment
<input type="checkbox"/> Move the array designators [] to the type.	Why is this an issue? 9 minutes ago L5 % T Code Smell Minor Open Not assigned 5min effort Comment
<input type="checkbox"/> Remove this method and declare a constant for this value.	Why is this an issue? 9 minutes ago L7 % T Code Smell Minor Open Not assigned 5min effort Comment
<input type="checkbox"/> Add a nested comment explaining why this method is empty, throw an UnsupportedOperationException or complete the implementation.	Why is this an issue? 9 minutes ago L11 % T Code Smell Critical Open Not assigned 5min effort Comment

src/Users/Professor.java

- 2 duplicated blocks of code must be removed. **DEPRECATED**
 - Code Smell Major Open Not assigned 30min effort Comment
 - Why is this an issue? 9 minutes ago 9 pitfall
- Rename this package name to match the regular expression "^[a-z_]+([a-z_][a-zA-Z0-9_])*\$".
 - Code Smell Minor Open Not assigned 10min effort Comment
 - Why is this an issue? 9 minutes ago L1 convention
- Rename this field "PhDTopic" to match the regular expression "^[a-zA-Z][a-zA-Z0-9_]*\$".
 - Code Smell Minor Open Not assigned 2min effort Comment
 - Why is this an issue? 9 minutes ago L9 convention

src/Users/Student.java

- 1 duplicated blocks of code must be removed. **DEPRECATED**
 - Code Smell Major Open Not assigned 20min effort Comment
 - Why is this an issue? 9 minutes ago 9 pitfall
- Rename this package name to match the regular expression "^[a-z_]+([a-zA-Z0-9_])*\$".
 - Code Smell Minor Open Not assigned 10min effort Comment
 - Why is this an issue? 9 minutes ago L1 convention
- Rename this field "Id" to match the regular expression "^[a-zA-Z][a-zA-Z0-9_]*\$".
 - Code Smell Minor Open Not assigned 2min effort Comment
 - Why is this an issue? 9 minutes ago L5 convention

src/Users/TA.java

- 2 duplicated blocks of code must be removed. **DEPRECATED**
 - Code Smell Major Open Not assigned 30min effort Comment
 - Why is this an issue? 9 minutes ago 9 pitfall
- Rename this package name to match the regular expression "^[a-z_]+([a-zA-Z0-9_])*\$".
 - Code Smell Minor Open Not assigned 10min effort Comment
 - Why is this an issue? 9 minutes ago L1 convention

51 of 51 shown

Refactored version

Overview Issues Security Hotspots Measures Code Activity Project Settings Project Information

My Issues All

Bulk Change

1 / 6 issues 7min effort

Filters

Type

- Bug 0
- Vulnerability 0
- Code Smell 6

Severity

- Blocker 0
- Critical 0
- Major 1
- Minor 5
- Info 0

Scope

Resolution

Status

Security Category

Creation Date

Language

Rule

Tag

Directory

File

Assignee

Author

src/courses/Course.java

- Replace the type specification in this constructor call with the diamond operator ("<>").
 - (sonar.java.source not set. Assuming 7 or greater.)
 - Code Smell Minor Open Not assigned 1min effort Comment
 - Why is this an issue? 1 minute ago L27 clumsy
- Replace the type specification in this constructor call with the diamond operator ("<>").
 - (sonar.java.source not set. Assuming 7 or greater.)
 - Code Smell Minor Open Not assigned 1min effort Comment
 - Why is this an issue? 1 minute ago L28 clumsy
- Replace the type specification in this constructor call with the diamond operator ("<>").
 - (sonar.java.source not set. Assuming 7 or greater.)
 - Code Smell Minor Open Not assigned 1min effort Comment
 - Why is this an issue? 1 minute ago L29 clumsy
- Replace the type specification in this constructor call with the diamond operator ("<>").
 - (sonar.java.source not set. Assuming 7 or greater.)
 - Code Smell Minor Open Not assigned 1min effort Comment
 - Why is this an issue? 1 minute ago L32 clumsy
- Replace the type specification in this constructor call with the diamond operator ("<>").
 - (sonar.java.source not set. Assuming 7 or greater.)
 - Code Smell Minor Open Not assigned 1min effort Comment
 - Why is this an issue? 1 minute ago L33 clumsy

src/users/Observers.java

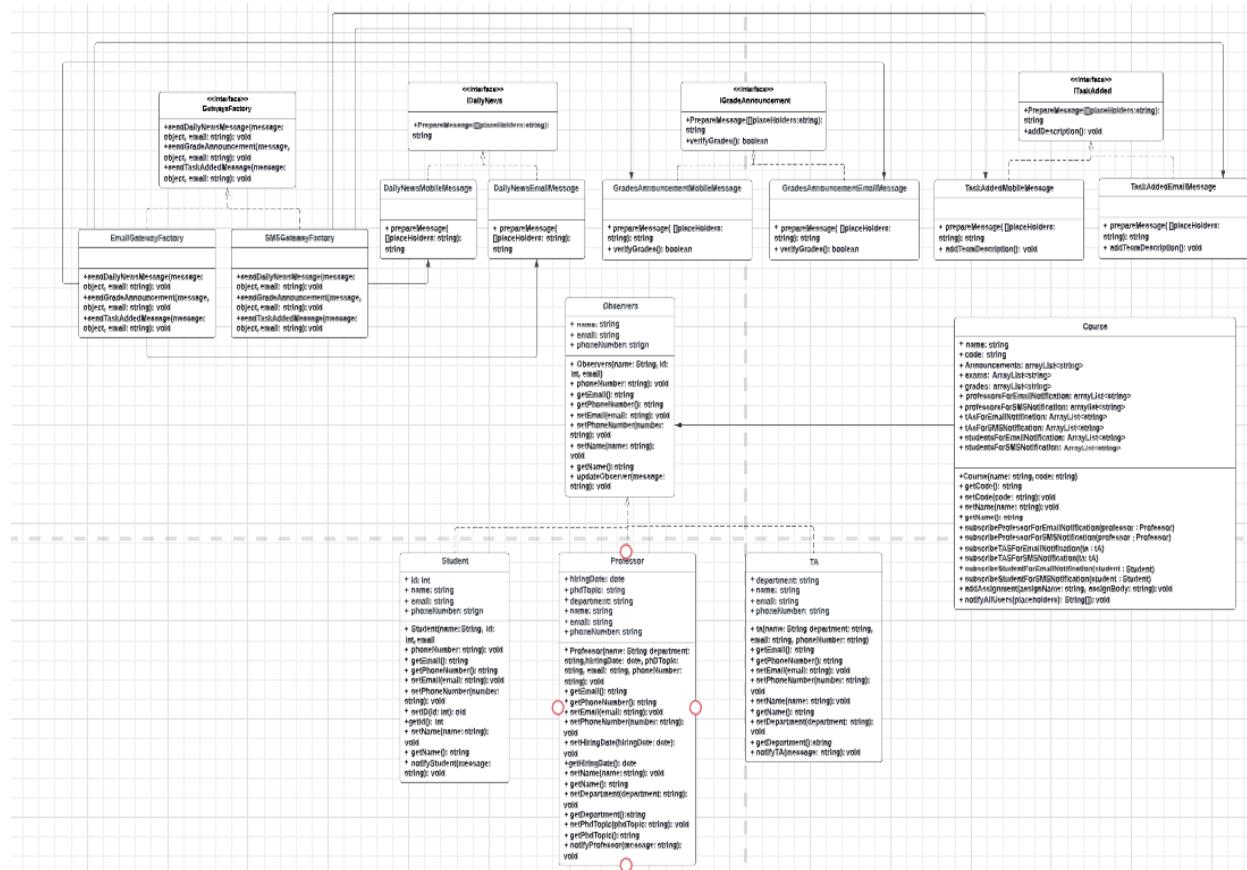
- Change the visibility of this constructor to "protected".
 - Code Smell Major Open Not assigned 2min effort Comment
 - Why is this an issue? 1 minute ago L9 design

6 of 6 shown

Embedded database should be used for evaluation purposes only
The embedded database will not scale, it will not support upgrading to newer versions of SonarQube, and there is no support for migrating your data out of it into a different database engine.

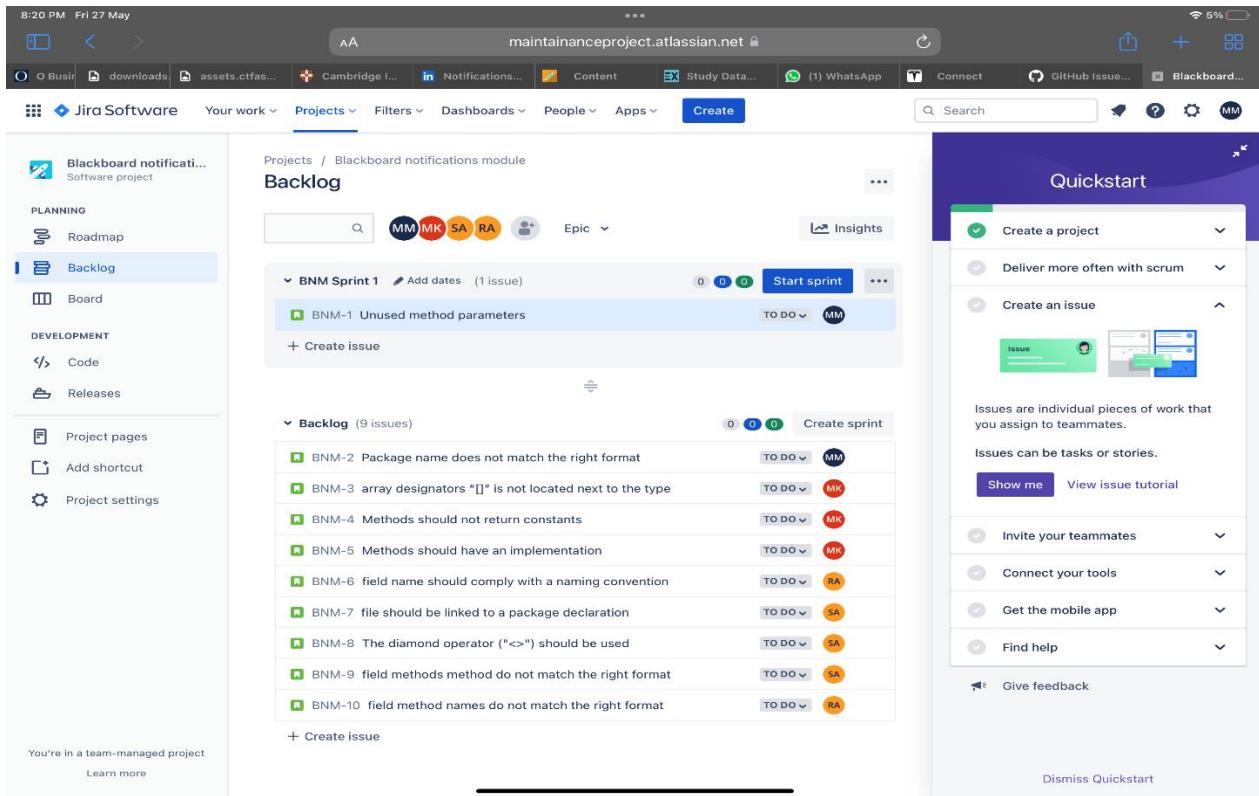
SonarQube™ technology is powered by SonarSource SA
Community Edition - Version 9.4 (build 54424) - LGPL v3 - Community - Documentation - Plugins - Web API

5- Class Diagram



6- JIRA Issue Tracking Snapshots

Initial version



8:20 PM Fri 27 May

Projects / Blackboard notifications module

Backlog

BNM Sprint 1 (1 issue)

BNM-1 Unused method parameters (TO DO, MM)

+ Create issue

Backlog (9 issues)

- BNM-2 Package name does not match the right format (TO DO, MM)
- BNM-3 array designators "[]" is not located next to the type (TO DO, MK)
- BNM-4 Methods should not return constants (TO DO, MK)
- BNM-5 Methods should have an implementation (TO DO, MK)
- BNM-6 field name should comply with a naming convention (TO DO, RA)
- BNM-7 file should be linked to a package declaration (TO DO, SA)
- BNM-8 The diamond operator ("<>") should be used (TO DO, SA)
- BNM-9 field methods method do not match the right format (TO DO, SA)
- BNM-10 field method names do not match the right format (TO DO, RA)

+ Create issue

Quickstart

- Create a project
- Deliver more often with scrum
- Create an issue
 - Issue
- Invite your teammates
- Connect your tools
- Get the mobile app
- Find help

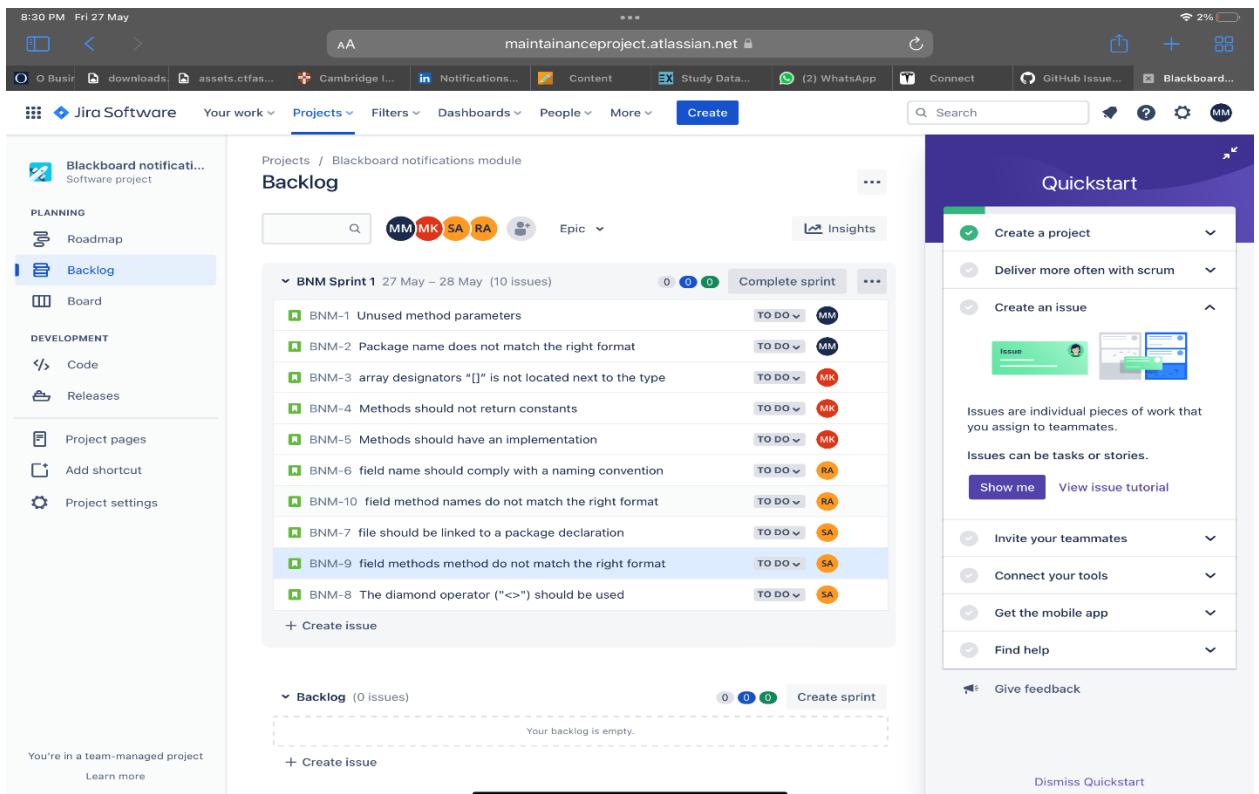
Issues are individual pieces of work that you assign to teammates.

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Projects / Blackboard notifications module

Backlog

BNM Sprint 1 27 May – 28 May (10 issues)

BNM-1 Unused method parameters (TO DO, MM)

BNM-2 Package name does not match the right format (TO DO, MM)

BNM-3 array designators "[]" is not located next to the type (TO DO, MK)

BNM-4 Methods should not return constants (TO DO, MK)

BNM-5 Methods should have an implementation (TO DO, MK)

BNM-6 field name should comply with a naming convention (TO DO, RA)

BNM-7 file should be linked to a package declaration (TO DO, SA)

BNM-8 The diamond operator ("<>") should be used (TO DO, SA)

BNM-9 field methods method do not match the right format (TO DO, SA)

BNM-10 field method names do not match the right format (TO DO, RA)

+ Create issue

Backlog (0 issues)

Your backlog is empty.

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Quickstart

- Create a project
- Deliver more often with scrum
- Create an issue
 - Issue
- Invite your teammates
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BNM Sprint 1

0 days remaining Complete sprint ...

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PLANNING Roadmap Backlog Board

DEVELOPMENT Code Releases Project pages Add shortcut Project settings

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TO DO 6 ISSUES

- Package name does not match the right format (MM)
- Methods should not return constants (MK)
- Methods should have an implementation (BNM-4, MK)
- field method names do not match the right format (BNM-5, RA)
- field methods method do not match the right format (BNM-9, SA)
- The diamond operator ("<>") should be used (BNM-8, SA)

IN PROGRESS 4 ISSUES

- Unused method parameters (BNM-1, MM)
- array designators "[] is not located next to the type (BNM-3, MK)
- field name should comply with a naming convention (BNM-6, RA)
- file should be linked to a package declaration (BNM-7, SA)

DONE

+ Add

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Backlog

Epic Insights

BNM Sprint 1 Add dates (4 issues) Start sprint ...

- BNM-1 Unused method parameters (TO DO, MM)
- BNM-3 array designators "[] is not located next to the type (TO DO, MK)
- BNM-6 field name should comply with a naming convention (TO DO, RA)
- BNM-7 file should be linked to a package declaration (TO DO, SA)

+ Create issue

Backlog (6 issues) Create sprint

- BNM-2 Package name does not match the right format (TO DO, MM)
- BNM-4 Methods should not return constants (TO DO, MK)
- BNM-5 Methods should have an implementation (TO DO, MK)
- BNM-8 The diamond operator ("<>") should be used (TO DO, SA)
- BNM-9 field methods method do not match the right format (TO DO, SA)
- BNM-10 field method names do not match the right format (TO DO, RA)

+ Create issue

Quickstart

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BNM Sprint 1

0 days remaining Complete sprint

TO DO 2 ISSUES

- Methods should have an implementation (BNM-5, MK)
- field methods method do not match the right format (BNM-9, SA)

IN PROGRESS 4 ISSUES

- Package name does not match the right format (BNM-2, MM)
- Methods should not return constants (BNM-4, MK)
- field method names do not match the right format (BNM-10, RA)
- The diamond operator ("<>") should be used (BNM-8, SA)

DONE 4 ISSUES

- Unused method parameters (BNM-1, MM)
- array designators "[]" is not located next to the type (BNM-3, MK)
- field name should comply with a naming convention (BNM-6, RA)
- file should be linked to a package declaration (BNM-7, SA)

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BNM Sprint 1

0 days remaining Complete sprint

TO DO

- Methods should have an implementation (BNM-5, MK)
- field methods method do not match the right format (BNM-9, SA)

IN PROGRESS 2 ISSUES

- Methods should have an implementation (BNM-5, MK)
- field methods method do not match the right format (BNM-9, SA)

DONE 8 ISSUES

- Unused method parameters (BNM-1, MM)
- array designators "[]" is not located next to the type (BNM-3, MK)
- field name should comply with a naming convention (BNM-6, RA)
- file should be linked to a package declaration (BNM-7, SA)
- Package name does not match the right format (BNM-2, MM)
- Methods should not return constants (BNM-4, MK)

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TO DO IN PROGRESS DONE 10 ISSUES

BNM-7 SA

Package name does not match the right format

BNM-2 MM

Methods should not return constants

BNM-4 MK

field method names do not match the right format

BNM-10 RA

The diamond operator ("<>") should be used

BNM-8 SA

Methods should have an implementation

BNM-5 MK

field methods method do not match the right format

BNM-9 SA

0 days remaining Complete sprint

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Refactored version

Projects / Blackboard notifications module
BNM Sprint 1

TO DO 1 ISSUE

IN PROGRESS

DONE 10 ISSUES

- Unused method parameters (BNM-1, MM)
- array designators "[]" is not located next to the type (BNM-3, MK)
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- Package name does not match the right format (BNM-2, MM)
- Methods should not return constants (BNM-4, MK)

Projects / Blackboard notifications module
BNM Sprint 1

TO DO 1 ISSUE

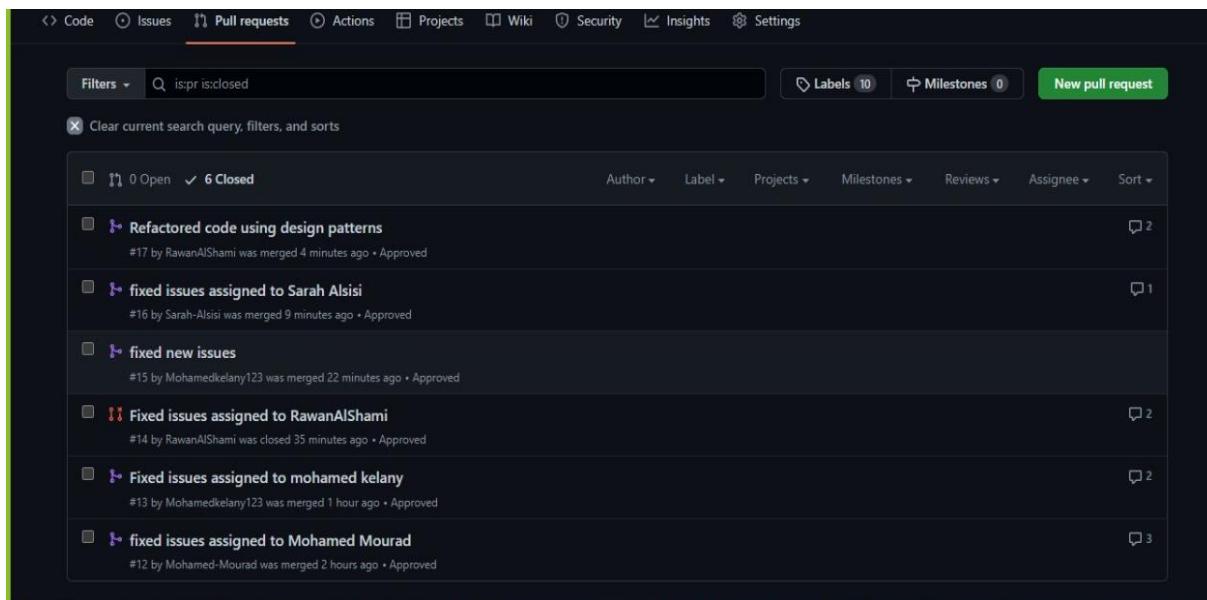
IN PROGRESS

DONE 10 ISSUES

- Package name does not match the right format (BNM-2, MM)
- Methods should not return constants (BNM-4, MK)
- field method names do not match the right format (BNM-10, RA)
- The diamond operator ("<>") should be used (BNM-8, SA)
- Methods should have an implementation (BNM-5, MK)
- field methods method do not match the right format (BNM-9, SA)

7- Github Repository link

<https://github.com/RawanAlShami/BlackboardNotificationsModuleMaintenance>

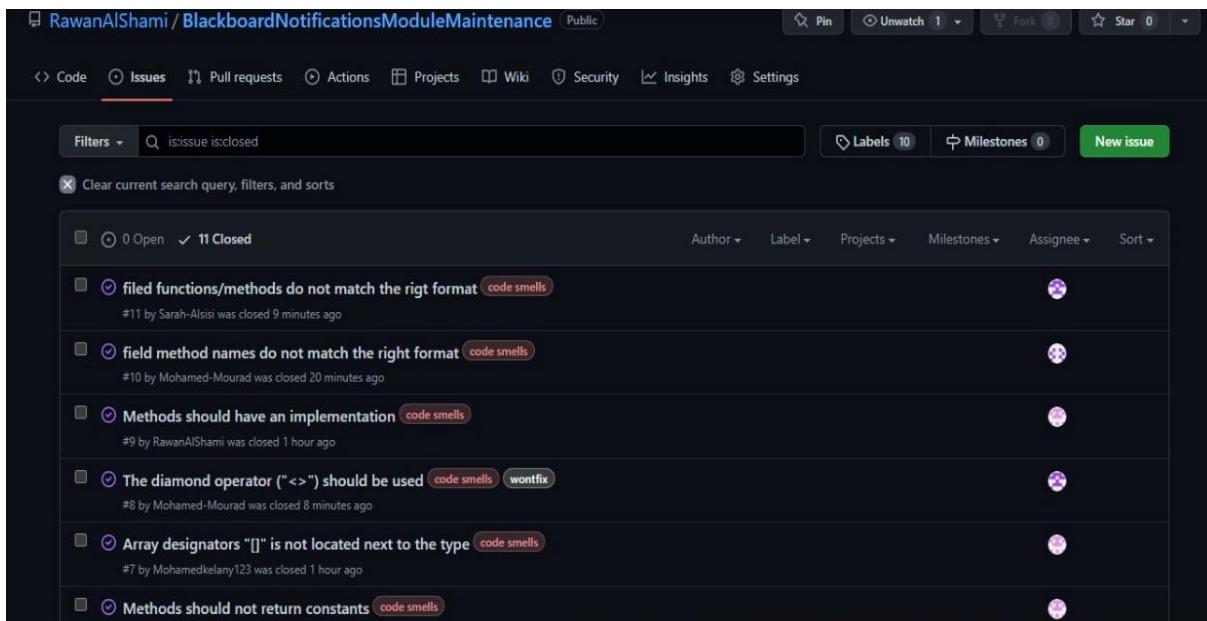


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Clear current search query, filters, and sorts

Author	Label	Projects	Milestones	Reviews	Assignee	Sort
0 Open	✓ 6 Closed					
Refactored code using design patterns #17 by RawanAlShami was merged 4 minutes ago • Approved						
fixed issues assigned to Sarah Alsisi #16 by Sarah-Alsisi was merged 9 minutes ago • Approved						
fixed new issues #15 by Mohamedkelany123 was merged 22 minutes ago • Approved						
Fixed issues assigned to RawanAlShami #14 by RawanAlShami was closed 35 minutes ago • Approved						
Fixed issues assigned to mohamed kelany #13 by Mohamedkelany123 was merged 1 hour ago • Approved						
fixed issues assigned to Mohamed Mourad #12 by Mohamed-Mourad was merged 2 hours ago • Approved						



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Author	Label	Projects	Milestones	Assignee	Sort	
0 Open	✓ 11 Closed					
filed functions/methods do not match the right format (code smells)						
#11 by Sarah-Alsisi was closed 9 minutes ago						
field method names do not match the right format (code smells)						
#10 by Mohamed-Mourad was closed 20 minutes ago						
Methods should have an implementation (code smells)						
#9 by RawanAlShami was closed 1 hour ago						
The diamond operator ("<>") should be used (code smells) (wontfix)						
#8 by Mohamed-Mourad was closed 8 minutes ago						
Array designators "[]" is not located next to the type (code smells)						
#7 by Mohamedkelany123 was closed 1 hour ago						
Methods should not return constants (code smells)						