PRT 452 Assignment 1

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# Question 1

A git is created and can be found at <https://github.com/ludwigHoon/PRT452_A1> which contains this documents as well as the codes for Question 2.

# Question 2

Refer to <https://github.com/ludwigHoon/PRT452_A1> .

# Question 3

The bugs below are found at <https://issues.apache.org/jira/secure/Dashboard.jspa> . A filter is created to include the followings:

1. Projects in all Apache Commons
2. Issue type equals to bug
3. Status equals to resolved

## Code smell 1: Data clump

Found at : <https://issues.apache.org/jira/browse/RESOURCES-6>

### Description:

The bug is found at Commons Resources. A lot of the similar parameters were used together in functions. The errors were caused the order of parameters for some functions. The fix was to switch the order of functions.

## Code smell 2: Message chain

Found at : <https://issues.apache.org/jira/browse/DIGESTER-163>

### Description:

The bug is found at Commons Digester. The code smell is found in multiple commits (1301815 and 1301174). The fixes applied is to simplify the message chain, e.g. from rulesBinders.get().addError( messagePattern, arguments ); to rulesBinder.addError( messagePattern, arguments );

## Code smell 3: Middle man

Found at : <https://issues.apache.org/jira/browse/IMAGING-193>

### Description:

The bug is found at Commons Imaging. The code smell is when there are multiple similar classes. A few classes are scrapped because they are unused.

## Code smell 4: Speculative generality

Found at : <https://issues.apache.org/jira/browse/RESOURCES-17>

### Description:

The bug is found at Commons Resources. The modification was to remove certain functions that are not used.

## Code smell 5: Switch statements

Found at : <https://issues.apache.org/jira/browse/RESOURCES-6>

### Description:

The bug is found at Commons Jelly. The error is at the switch case statement where the position of the default caused error. The fix was to move the position of default action