#### 1 Introduction

Code Review is a systematic examination (also referred as Peer review) of the source code. The review process is performed to find the mistakes which was ignored in the initial development phase and arr usually performed to improve the overall quality of the software by improving internal code quality and maintainability, also find performance problems, security vulnerabilities etc [1].

### Manual Review

```
7 /**
8 * @author Manikandan Shanmugam
9 *
10 */
11 public class Logfun {
12
13     private static Scanner s1;
14     private static Scanner s2;
15
```

Figure 1: No Meaningful Names Error

```
48
                return xt;
 49
            }
 50
            x = Double.parseDouble(sd);
 51
            return x;
 52
        }
 53
 54⊜
        static double validateBase() {
            //validating the base input value to be a positive real numb
 56
            double base = 0;
            s2 = new Scanner(System.in);
 57
 58
            System.out.println("\nEnter the value of base:");
            String st1 = s2.next();
 59
            String sd = st1;
 60
            if(st1.equalsIgnoreCase("1")) {
 61
                System.out.println("Incorrect base value. Please provide
 62
 63
                double b=validateBase();
 64
                return b;
 65
            } .
```

Figure 2: Javadoc Comments Absent

A method can have only one return statement and that should be the end of the statement.

```
ŏΙ
              pase = pouble.parsevouble(sa);
 82
              return base;
 83
 84
         static int floorCeil(double s,double x,double base) {
 85@
 86
              if(x==1) {
 87
                  return 0;
 88
              else if(s==0) {
 89
 90
                  double b1=base;
                  double s1=s+1;
 91
 92
                  for(int v=1;v<=s1;v++) {</pre>
                      base=base*b1;
 93
                  if(base<x) {</pre>
 95
 96
                      return 1;
 97
                  else if(base>x) {
 98
 99
                      return 1;
100
101
102
              else {
                  double b1=base;
103
104
                  for(int v=1;v<s;v++) {</pre>
                      base=base*b1;
105
106
107
                  if(base<x) {</pre>
108
                      return 1;
109
110
                  else if(base>x) {
111
                      return 2;
112
113
                  else {
114
                      return 0;
115
116
117
              return -1;
118
         }
```

Figure 3: Multiple Return Error

### SonarQube

SonarQube is a free and open source static code analysis tool to detect bugs, code smells, security vulnerabilities. SonarQube supports more than 20 programming languages and it has inbuilt rules for most of the languages. I have hosted SonarQube on my system and used it to perform the code review and used the java rule-set(consisted of 351 active rules) to perform the analysis.

# Review Report

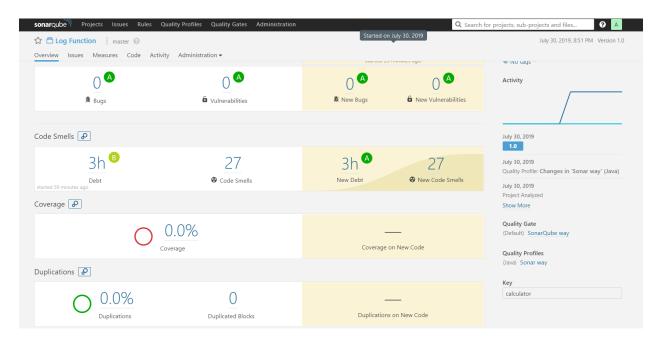


Figure 4: SonarQube Dashboard. (Log Function)



Figure 5: Critical Errors

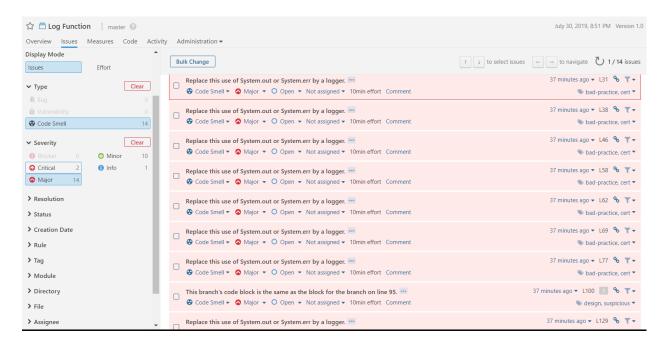


Figure 6: Major Errors

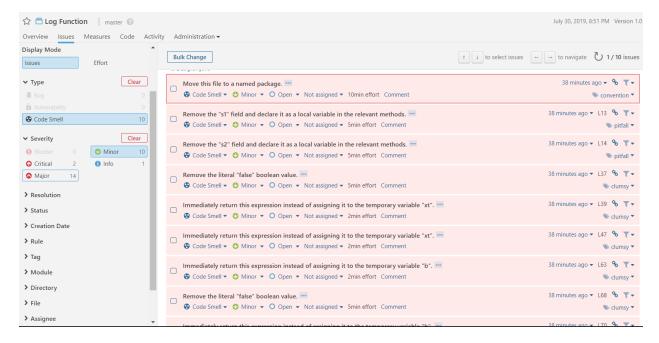


Figure 7: Minor Errors

```
sonarqube Projects Issues Rules Quality Profiles Quality Gates Administratio
                                                                                                                                        Q Search for projects, sub-projects and files...
☆ 🗖 Log Function 🕴 master 🔞
Overview Issues Measures Code Activity Administration ▼
Project Overview
                                             Log Function / src / Logfun.java 🏠
                                              118
> Reliability 🔞
> Security 🕝
                                                                  public static void main(String[] args) {
                                              120
                                                                 // TODO Auto-generated method stub
// Main method which controls the execution flow

▼ Maintainability ②

                                             123
124
                                                                         double base = validateBase();
double x = validateX();
                                                                                                                                                                //validating the base value
                                   P
Overview
                                                                                                                                                                       //validating the X valu
On new code
                                              125
126
                                                                         double s = logCalculate(x,base);
                                                                                                                                                                //calculating the log value
                                                                         int q = 0;
q = floorCeil(s,x,base);
                                              127
128
                                                                                                                                                                       //checking for flooring
                             3h 24min
   Debt
   Debt Ratio
                                              129
130
                                                    •
ට
                                                                                 System.out.println("\nFlooring value of base "+base+" logarithm of ("+x+") is " + String.format("%.2f", s));
                                   A
   Rating
                                                    ۵
                                                                                 System.out.println("\nCeiling value of base "+base+" logarithm of ("+x+") is " + String.format("%.2f", s));
                                              131
132
 Overall
   Code Smells
                                              133
134
                                                                                 System.out.println("\nCeiling value of base "+base+" logarithm of ("+x+") is " + String.format("%.2f", s));
   Debt
                             3h 24min
                                              135
136
   Debt Ratio
                                5.9%
                                                                                 System.out.println("\nFlooring value of base "+base+" logarithm of ("+x+") is " + String.format("%.2f", s));
                                  B
   Effort to Reach A
                               30min
                                                    a a a a a
                                              139
                                                                                 Code Smells debt (reported by manual re 0
                                                    141
                                              143
> Duplications
> Size
```

Figure 8: Function Main Method Implementation

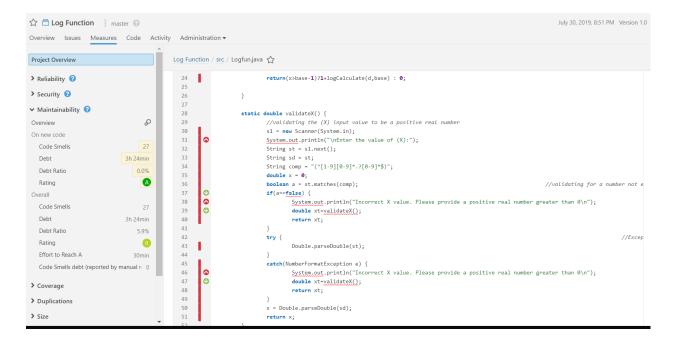


Figure 9: Function Method Implementation

```
☆ 🗖 Log Function 🕴 master 🔞
                                                                                                                                                              July 30, 2019, 8:51 PM Version 1.0
Overview Issues Measures Code Activity Administration ▼
Project Overview
                                           Log Function / src / Logfun.java 🏠
                                                               static double validateBase() {
> Reliability ②
                                                                      //validating the base input value to be a positive real number
                                             55
                                             56
57
> Security 🕝
                                                                       s2 = new Scanner(System.in);

✓ Maintainability ②

                                                                      System.out.println("\nEnter the value of base:");
                                             58
59
60
61
62
63
64
                                                                      String st1 = s2.next();
String sd = st1;
On new code
                                                                      ②
                                 27
  Code Smells
                                                                              return b;
  Debt Ratio
                                                                      String comp = "(^[1-9][0-9]*.?[0-9]*$)";
  Rating
                                                                      boolean d = st1.matches(comp);
                                                                                                                                                          //validating for a number not e
                                                   0 0 0
Overall
                                                                      if(d==false) {
                                                                              System.out.println("Incorrect base value. Please provide a positive real number greater than 0\n");
                                 27
                                                                              double b=validateBase();
  Debt
                            3h 24min
  Debt Ratio
  Rating
                                 B
                                                                              Double.parseDouble(st1);
  Effort to Reach A
  Code Smells debt (reported by manual re 0
                                                                       catch(NumberFormatException e) {
                                                   ©
                                                                              System.out.println("Incorrect base value. Please provide a positive real number\n");
> Coverage
                                                                              double b=validateBase();
                                                                              return b;
> Duplications
                                                                      base = Double.parseDouble(sd);
> Size
```

Figure 10: Function Method Implementation

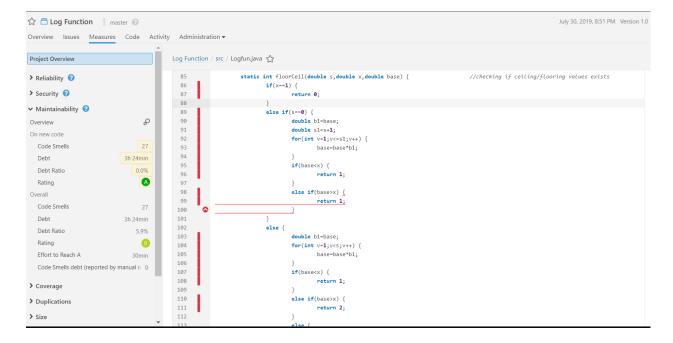
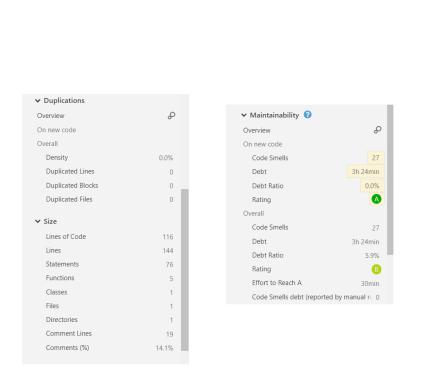


Figure 11: Function Method Implementation



**Project Overview** ▼ Reliability ② P Overview On new code Bugs 0 Rating Overall Bugs Rating Remediation Effort 0 ▼ Security ② Overview P On new code Vulnerabilities Rating Overall Vulnerabilities 0 Rating Remediation Effort

Figure 12: Quality Measures

Figure 13: Quality Measures

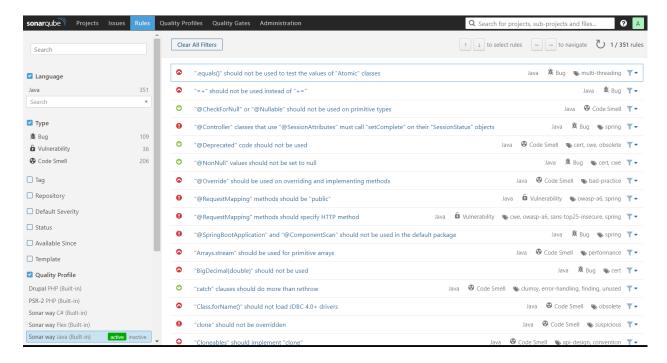


Figure 14: SonarQube Java Rules

# Github

This is the Link to my project repository : F3:  $\sinh(x)$  or you can go to the url : https://github.com/Ruthvik-Shandilya/SOEN-6011.

This is the Link to the reviewed project repository : F4: logb(x) or you can go to the url : https://github.com/manikandan-ms/SOEN6011.

# References

[1] Code Review, texttthttps://en.wikipedia.org/wiki/Codereview