IT 314 – Software Engineering

Lab 7

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Magic Number Code

Program Inspection

Question 1. How many errors are there in the program? Mention the errors you have identified.

A syntax error can be identified by the compiler itself, on line 18 of the code. Also, if 119 is to be a magic number, the logic used in the code is a bit incorrect. The condition of the inner while loop is incorrect, as the loop should run till sum is not equal to zero.

Then, the inner logic of the code is changed to correctly calculate whether the number is a magic number or not.

Question 2. Which category of program inspection would you find more effective?

For this question, the Category C of the program inspection, the Computational errors were the most effective, as the failure of the code was due to the use of wrong operators.

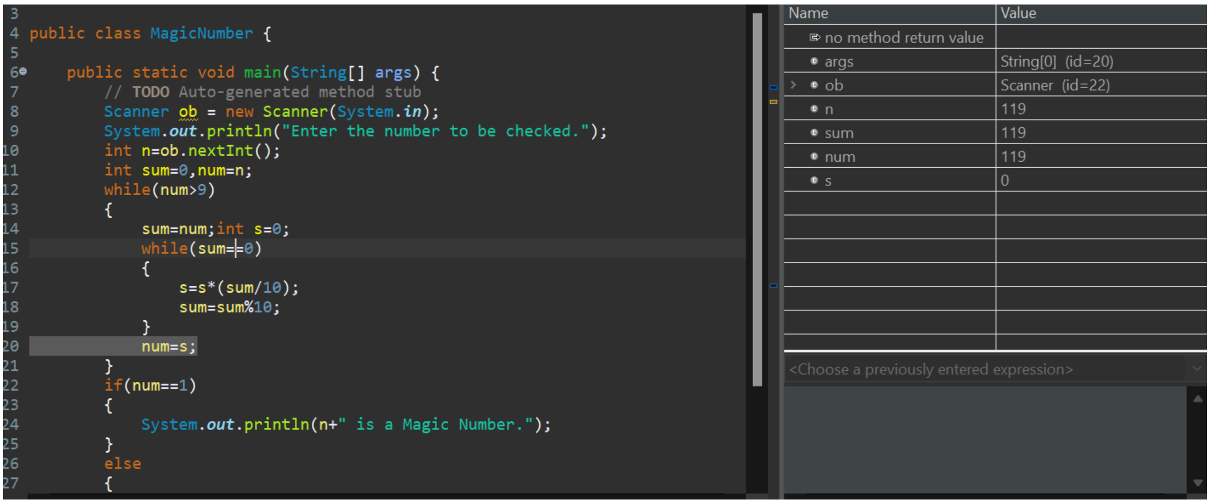
Question 3. Which type of error you are not able to identified using the program inspection?

In this example, all the errors in the document were identifiable using the program inspection method.

Question 4. Is the program inspection technique is worth applicable?

Due to the small length of the code and easy to find computational errors, the program inspection technique is worth applicable here.

Code Debugging



```
 3
 4 public class MagicNumber {
 5
 6     public static void main(String[] args) {
 7         // TODO Auto-generated method stub
 8         Scanner ob = new Scanner(System.in);
 9         System.out.println("Enter the number to be checked.");
10         int n=ob.nextInt();
11         int sum=0,num=n;
12         while(num>9)
13         {
14             sum=num;int s=0;
15             while(sum==0)
16             {
17                 s=s*(sum/10);
18                 sum=sum%10;
19             }
20             num=s;
21         }
22         if(num==1)
23         {
24             System.out.println(n+" is a Magic Number.");
25         }
26         else
27         {
```

Name	Value
no method return value	
args	String[0] (id=20)
ob	Scanner (id=22)
n	119
sum	119
num	119
s	0

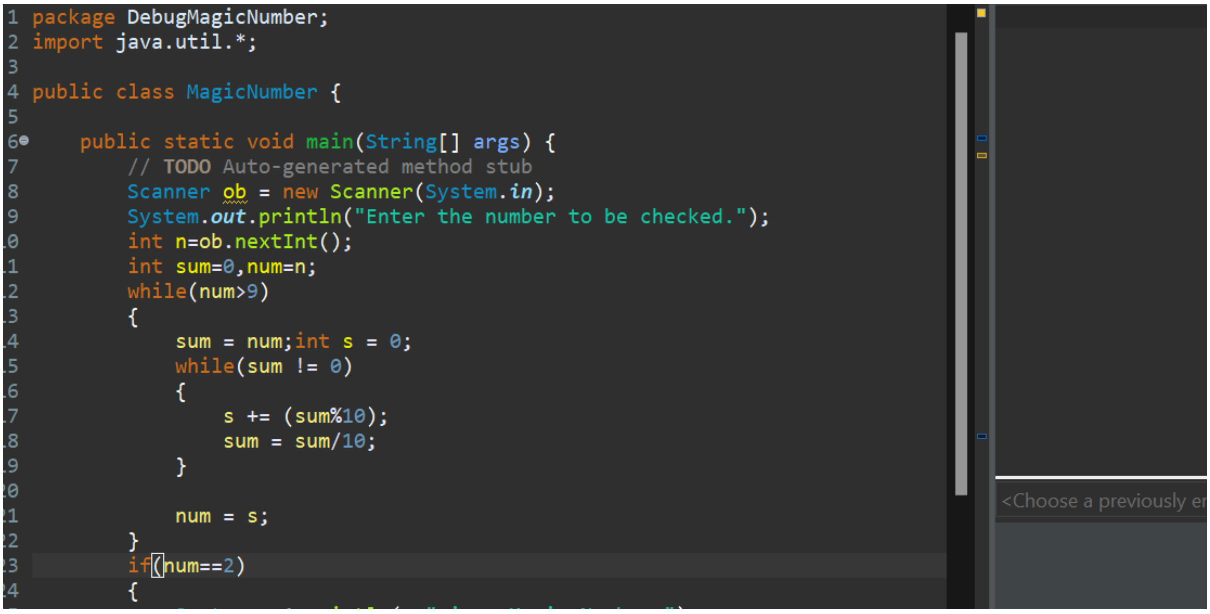
Question 1. How many errors are there in the program? Mention the errors you have identified.

There were 2 errors in this program. After the syntax error was cleared and the condition in the inner while loop changed, we only needed to update the logic to find the magic number.

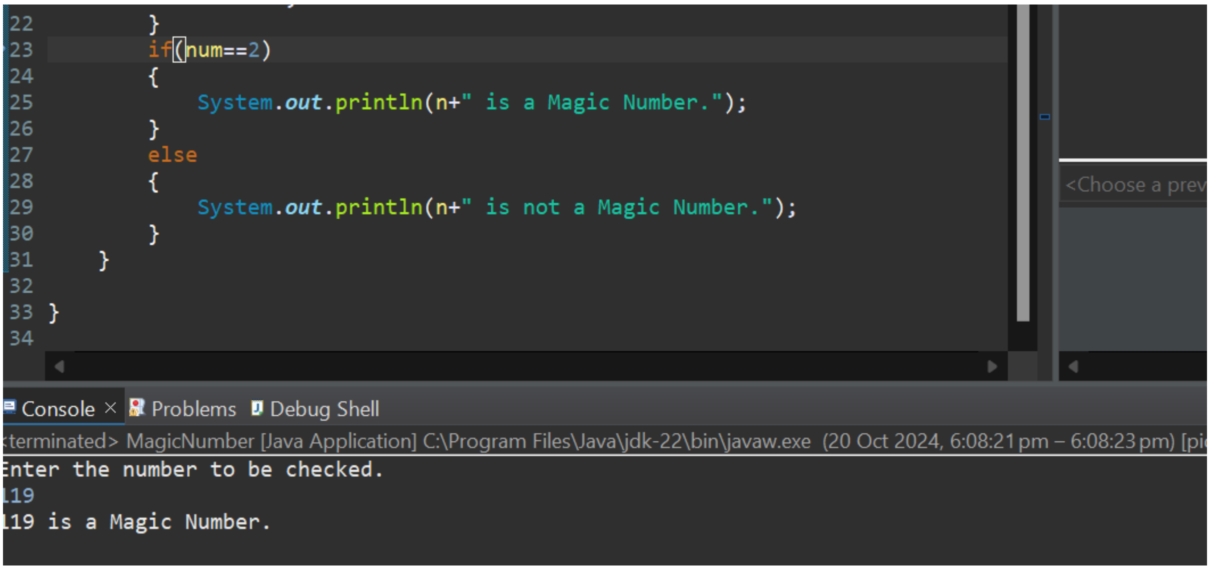
Question 2. How many breakpoints you need to fix those errors? What are the steps you have taken to fix the error you identified in the code fragment?

With just one break point of line 18, to find the iteration of the for loop, we were able to locate the mistakes in the document. Once the mistakes were fixed as shown below, the program was running.

Question 3. Submit your complete executable code.



```
1  package DebugMagicNumber;
2  import java.util.*;
3
4  public class MagicNumber {
5
6      public static void main(String[] args) {
7          // TODO Auto-generated method stub
8          Scanner ob = new Scanner(System.in);
9          System.out.println("Enter the number to be checked.");
10         int n=ob.nextInt();
11         int sum=0,num=n;
12         while(num>9)
13         {
14             sum = num;int s = 0;
15             while(sum != 0)
16             {
17                 s += (sum%10);
18                 sum = sum/10;
19             }
20
21             num = s;
22         }
23         if(num==2)
24         {
```



```
22         }
23         if(num==2)
24         {
25             System.out.println(n+" is a Magic Number.");
26         }
27         else
28         {
29             System.out.println(n+" is not a Magic Number.");
30         }
31     }
32
33 }
34
```

```
<terminated> MagicNumber [Java Application] C:\Program Files\Java\jdk-22\bin\javaw.exe  (20 Oct 2024, 6:08:21 pm – 6:08:23 pm) [pi
Enter the number to be checked.
119
119 is a Magic Number.
```