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**Department
of
COMPUTER SCIENCE AND ENGINEERING**

ASSIGNMENT-1

[18UCSE508- ADVANCED OBJECT ORIENTED PROGRAMMING]

Course Teacher: Prof. Indira R Umarji



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Submitted

By

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2SD20CS108

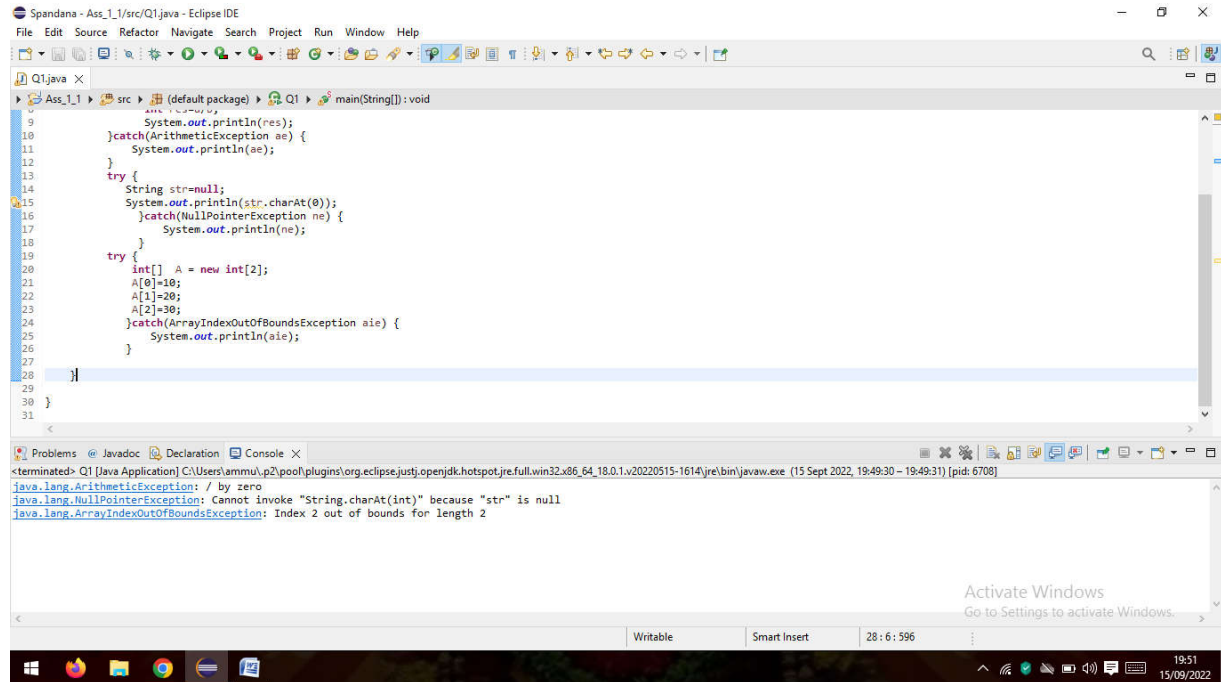
5th Semester B division

Q1. Write a Java program to generate and handle any three built-in exceptions and display appropriate error messages.

// Java program to generate and handle any three built-in exceptions

```
public class Q1 {  
  
    public static void main(String[] args) {  
        // TODO Auto-generated method stub  
        try {  
            int a=10,b=0;  
            int res=a/b;  
            System.out.println(res);  
        } catch(ArithmeticException ae) {  
            System.out.println(ae);  
        }  
        try {  
            String str=null;  
            System.out.println(str.charAt(0));  
        } catch(NullPointerException ne) {  
            System.out.println(ne);  
        }  
        try {  
            int[] A = new int[2];  
            A[0]=10;  
            A[1]=20;  
            A[2]=30;  
        } catch(ArrayIndexOutOfBoundsException aie) {  
            System.out.println(aie);  
        }  
    }  
}
```

OUTPUT:



The screenshot shows the Eclipse IDE interface. The main editor displays a Java file named Q1.java with the following code:

```
9      System.out.println(res);
10    }catch(ArithmeticException ae) {
11      System.out.println(ae);
12    }
13  }
14  try {
15    String str=null;
16    System.out.println(str.charAt(0));
17    }catch(NullPointerException ne) {
18      System.out.println(ne);
19    }
20  try {
21    int[] A = new int[2];
22    A[0]=10;
23    A[1]=20;
24    A[2]=30;
25    }catch(ArrayIndexOutOfBoundsException aie) {
26      System.out.println(aie);
27    }
28  }
29  }
30  }
31  }
```

The bottom console window shows the following output:

```
<terminated> Q1 [Java Application] C:\Users\anmu\p2\pool\plugins\org.eclipse.justi.openjdk.hotspot.jre.full.win32.x86_64_18.0.1.v20220515-1614\jre\bin\javaw.exe (15 Sept 2022, 19:49:30 - 19:49:31) [pid: 6708]
java.lang.ArithmeticException: / by zero
java.lang.NullPointerException: Cannot invoke "String.charAt(int)" because "str" is null
java.lang.ArrayIndexOutOfBoundsException: Index 2 out of bounds for length 2
```

The status bar at the bottom indicates the cursor is at line 28, column 6, with a file size of 596 bytes. The system tray shows the date and time as 19:51 on 15/09/2022.

Q2. Write a Java program to read an integer and check whether the number is prime or not. If negative number is entered, throw an exception NegativeNumberNotAllowedException and if entered number is not prime, then throw NumberNotPrimeException.

//Exception Class

```
class NegativeNumberNotAllowedException extends Exception{
    public String toString() {
        return "Negative number not allowed";
    }
}

class NumberNotPrimeException extends Exception{
    public String toString() {
        return "Number entered is not prime";
    }
}
```

//Main class

```
import java.util.Scanner;
public class Q2 {
    static int primeCheck(int n) {
        boolean flag=false;
        for(int i=2;i<=n/2;i++) {
            if(n%i==0){
                flag=true;
                break;
            }
        }
        if(!flag)
            return 1;
        else
            return 0;
    }
    public static void main(String[] args) throws Exception {
        // TODO Auto-generated method stub
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter an integer");
        int n=sc.nextInt();

        if(n<0)
```

```

        throw new NegativeNumberNotAllowedException();
    else {
        int a=primeCheck(n);
        if(a==1)
            System.out.println("Prime number");
        else
            throw new NumberNotPrimeException();
    }
}
}

```

OUTPUT:

The screenshot shows the Eclipse IDE interface. The left sidebar displays the Project Explorer with a tree view of the project structure, including packages like 'Ass_1_1', 'Ass_1_2', and 'Ass_1_3'. The main editor window shows the source code of 'Q2.java'. The code defines a 'primeCheck' method that returns 1 for prime numbers and 0 for non-prime numbers, and a 'main' method that prompts the user to enter an integer. The console window on the right shows the output of the program, indicating that the user entered 10, which is not a prime number, and an exception was thrown.

```

1  import java.util.Scanner;
2  public class Q2 {
3      static int primeCheck(int n) {
4          boolean flag=false;
5          for(int i=2;i<=n/2;i++) {
6              if(n%i==0){
7                  flag=true;
8                  break;
9              }
10             }
11             if(!flag)
12                 return 1;
13             else
14                 return 0;
15         }
16     }
17     public static void main(String[] args) throws Exception {
18         // TODO Auto generated method stub
19         Scanner sc=new Scanner(System.in);
20         System.out.println("Enter an integer");
21         int n=sc.nextInt();
22
23         if(n<0)
24             throw new NegativeNumberNotAllowedException();
25         else {
26             int a=primeCheck(n);
27             if(a==1)
28                 System.out.println("Prime number");
29             else
30                 throw new NumberNotPrimeException();
31         }
32     }
33 }
34
35
36
37

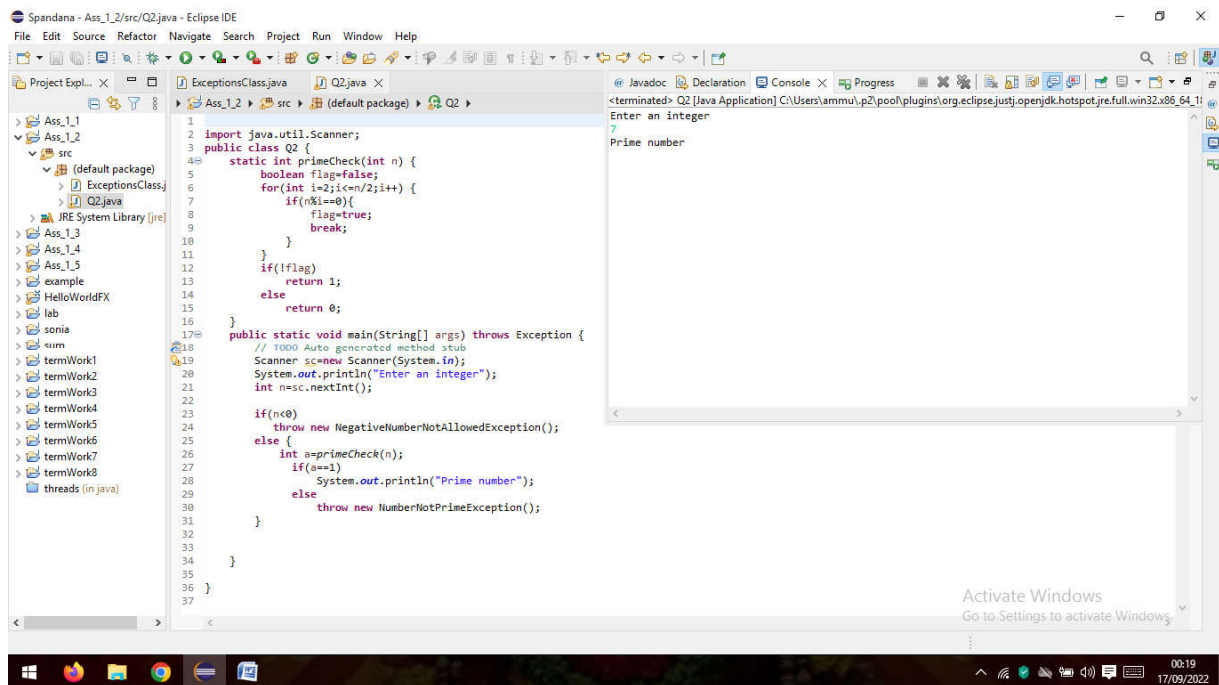
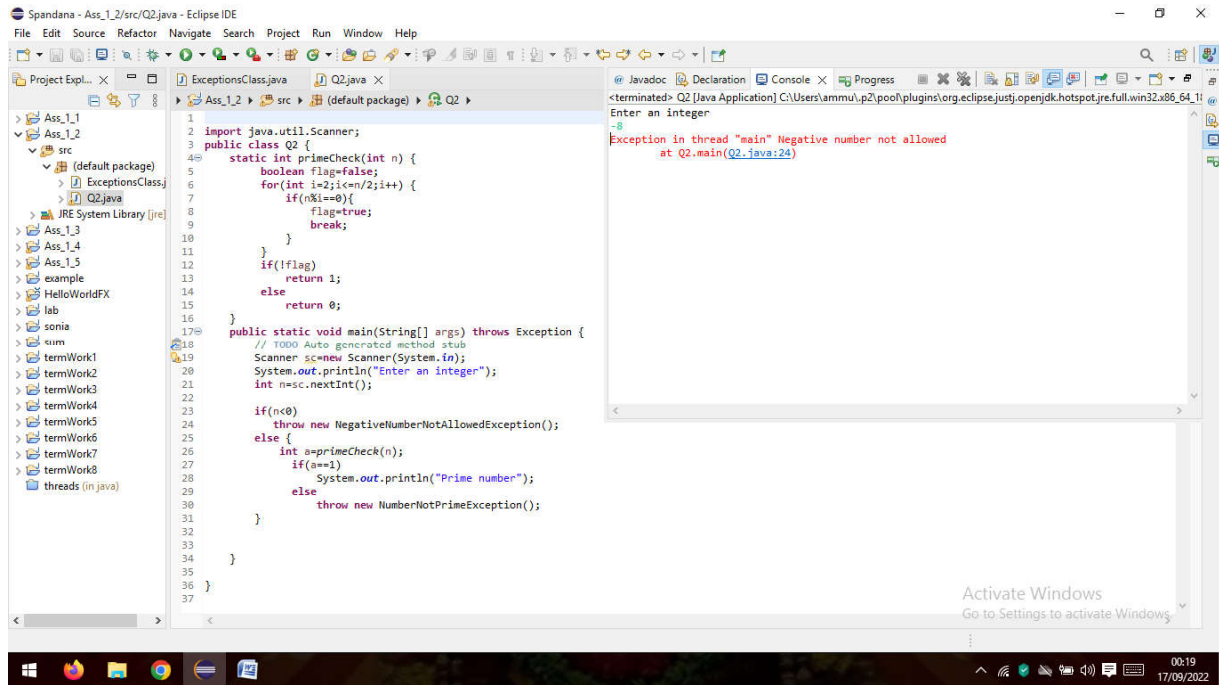
```

Console Output:

```

<terminated> Q2 [Java Application] C:\Users\ammu\p2\pool\plugins\org.eclipse.justi.openjdk.hotspot.jre.full.win32.x86_64_11
Enter an integer
10
Exception in thread "main" Number entered is not prime
at Q2.main(Q2.java:30)

```



Q3. Write a Java program to perform the following operations:

- a) Read a line of text
- b) Search for a sub-string SDMCET (case insensitive search)
- c) If found, then print success message
- d) Otherwise throw an exception SubStringNotFoundException with appropriate message

//Exception class

```
public class subStringNotFoundException extends Exception {  
    public String toString(){  
        return "sub-String Not Found";  
    }  
}
```

//main class

```
import java.util.Scanner;
```

```
class Q3 {
```

```
    public static void main(String[] args) throws Exception {  
        Scanner sc=new Scanner(System.in);
```

```
        System.out.println("Enter the text");  
        String text=sc.next();
```

```
        System.out.println("Enter pattern");  
        String pattern=sc.next();
```

```
        int len_t = text.length();  
        int len_p = pattern.length();
```

```
        int k = 0, i = 0, j = 0;
```

```
        for (i = 0; i <= (len_t - len_p); i++) {
```

```
            for (j = 0; j < len_p; j++)  
            {
```

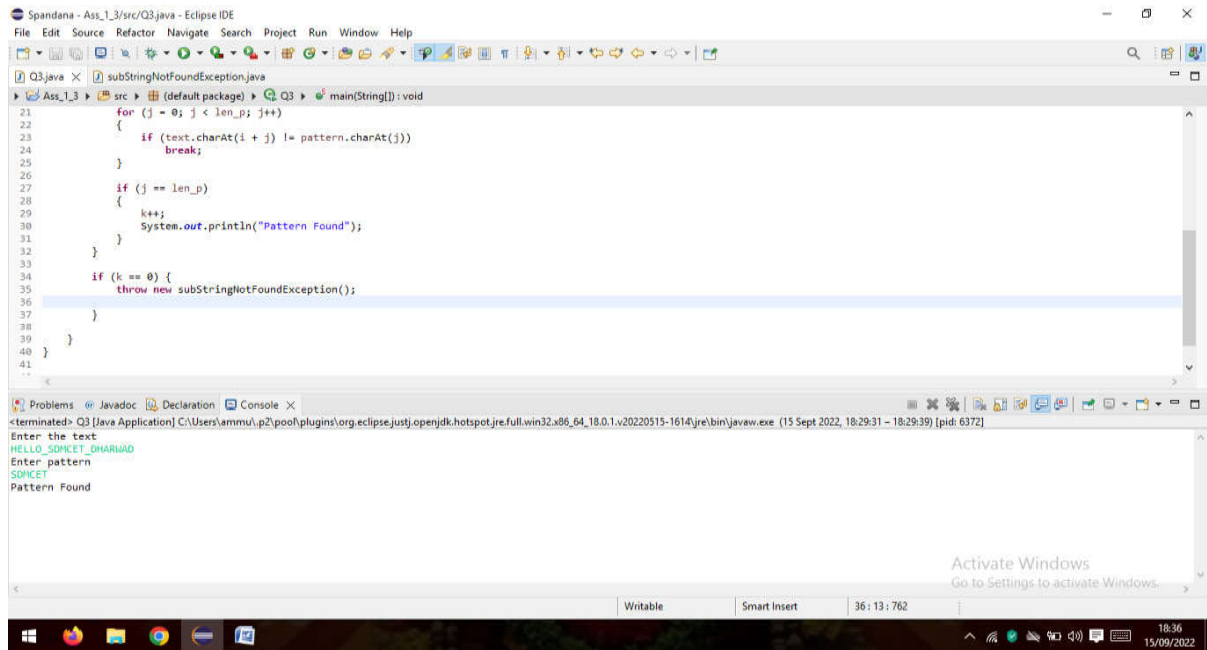
```
                if (text.charAt(i + j) != pattern.charAt(j))  
                    break;
```

```
        }

        if (j == len_p)
        {
            k++;
            System.out.println("Pattern Found");
        }
    }

    if (k == 0) {
        throw new subStringNotFoundException();
    }
}
}
```


OUTPUT:

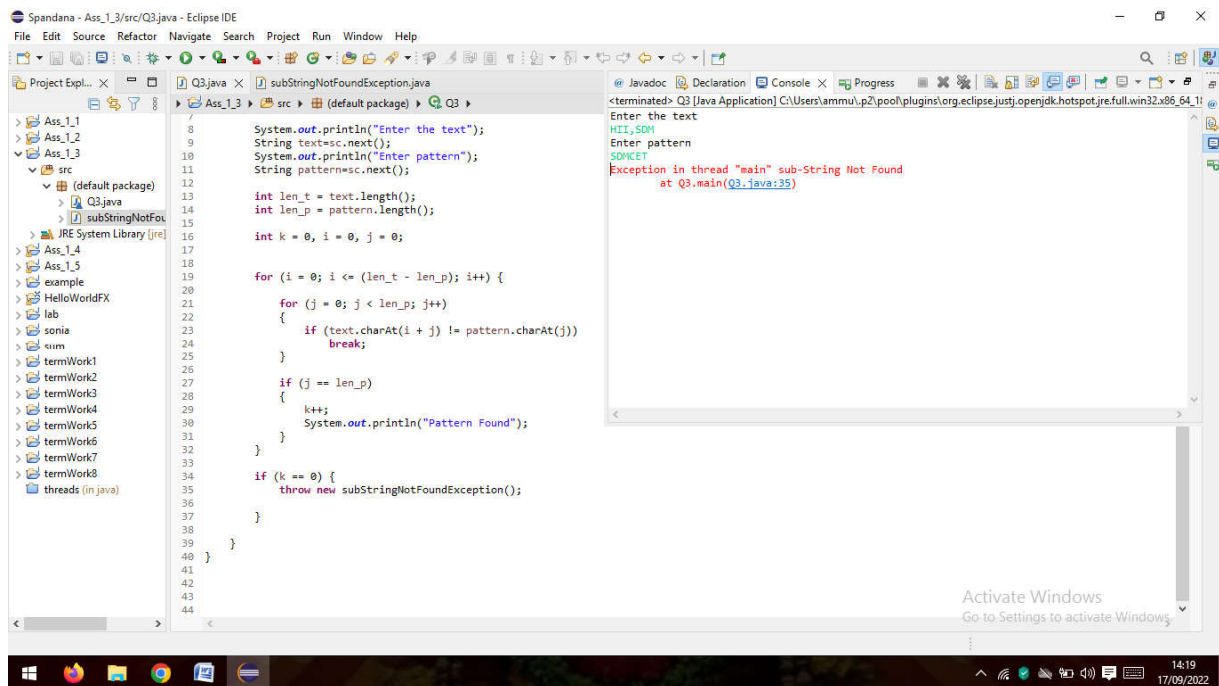


```
Spandana - Ass_1_3/src/Q3.java - Eclipse IDE
File Edit Source Refactor Navigate Search Project Run Window Help

Q3.java x subStringNotFoundException.java
Ass_1_3 src (default package) Q3 main(String[]):void
21 for (j = 0; j < len_p; j++)
22 {
23     if (text.charAt(i + j) != pattern.charAt(j))
24         break;
25 }
26
27 if (j == len_p)
28 {
29     k++;
30     System.out.println("Pattern Found");
31 }
32
33
34 if (k == 0) {
35     throw new subStringNotFoundException();
36 }
37
38
39 }
40
41
42
43
44

Problems Javadoc Declaration Console x
<terminated> Q3 [Java Application] C:\Users\ammul.p2\pool\plugins\org.eclipse.justi.openjdk.hotspot.jre.full.win32.x86_64_18.0.1.v20220515-1614\jre\bin\javaw.exe (15 Sept 2022, 18:29:31 - 18:29:39) [pid: 6372]
Enter the text
HELLO_SDNCET_DHARUAD
Enter pattern
SDNCET
Pattern Found

Activate Windows
Go to Settings to activate Windows.
```



```
Spandana - Ass_1_3/src/Q3.java - Eclipse IDE
File Edit Source Refactor Navigate Search Project Run Window Help

Project Expl... Q3.java x subStringNotFoundException.java
Ass_1_3 src (default package) Q3
8 System.out.println("Enter the text");
9 String text=src.next();
10 System.out.println("Enter pattern");
11 String pattern=src.next();
12
13 int len_t = text.length();
14 int len_p = pattern.length();
15
16 int k = 0, i = 0, j = 0;
17
18
19 for (i = 0; i <= (len_t - len_p); i++) {
20     for (j = 0; j < len_p; j++)
21     {
22         if (text.charAt(i + j) != pattern.charAt(j))
23             break;
24     }
25
26     if (j == len_p)
27     {
28         k++;
29         System.out.println("Pattern Found");
30     }
31 }
32
33
34 if (k == 0) {
35     throw new subStringNotFoundException();
36 }
37
38
39 }
40
41
42
43
44

Javadoc Declaration Console x Progress
<terminated> Q3 [Java Application] C:\Users\ammul.p2\pool\plugins\org.eclipse.justi.openjdk.hotspot.jre.full.win32.x86_64_18.0.1.v20220515-1614\jre\bin\javaw.exe (15 Sept 2022, 18:29:31 - 18:29:39) [pid: 6372]
Enter the text
HELLO_SDNCET_DHARUAD
Enter pattern
SDNCET
Exception in thread "main" sub-String Not Found
at Q3.main(Q3.java:35)

Activate Windows
Go to Settings to activate Windows.
```

Q4. Write a Java program to perform the following operations:

- a) Create a file named Alphabets.txt and insert appropriate data into it
- b) Read the file and copy all the consonants into another file named Consonants.txt
- c) If vowel is encountered, throw an exception VowelNotAllowedException and continue until end of file

//Exception class

```
class VowelNotAllowedException extends Exception{  
  
    public String toString() {  
  
        return "Vowel,not allowed";  
  
    }  
}
```

//main class

```
import java.io.FileInputStream;  
import java.io.FileOutputStream;  
public class Q4 {  
    public static void main(String [] args)throws Exception{  
  
        FileInputStream fis = new  
FileInputStream("C:\\Users\\joglekar\\Desktop\\Spandana\\Ass_1_4\\src\\Alphabets.txt");  
  
        FileOutputStream fos = new  
FileOutputStream("C:\\Users\\joglekar\\Desktop\\Spandana\\Ass_1_4\\src\\Consonants.txt");  
  
        int c;  
        while((c=fis.read())!=-1) {  
            try {  
  
                if(c=='a'||c=='e'||c=='i'||c=='o'||c=='u'||c=='A'||c=='E'||c=='I'||c=='O'||c=='U') {  
                    throw new VowelNotAllowedException();  
                }  
                fos.write(c);  
            } catch (Exception e) {  
                System.out.println(e);  
            }  
        }  
    }  
}
```

```

    }
}
}
}
}

```

OUTPUT:

