Department of Computer Science & Engineering, SDMCET, Dharwad-2

[Submitted as part of CTA Assignment No-1]

Course:	Advanced Object-Oriented Programming	Course Code:	18UCSE508
Semester:	V	Division:	B

Submitted by:

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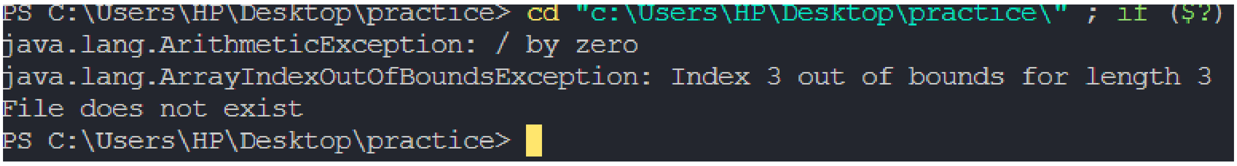
1. Problem definition:

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

2. Java Program:

```
import java.io.File;
import java.io.FileNotFoundException;
import java.io.FileReader;


class assignment1 {
    public static void main(String[] args) {
        int a=10;
        int b=0;

        try{
            System.out.println(a/b);
        }
        catch(ArithmeticException e){
            System.out.println(e);
        }

        int arr[]={1,2,3};

        try{
            System.out.println(arr[3]);
        }
        catch(ArrayIndexOutOfBoundsException e){
            System.out.println(e);
        }

        try {
            File file = new File("file.txt");

            FileReader fr = new FileReader(file);
        }
        catch (FileNotFoundException e) {
            System.out.println("File does not exist");
        }


    }
}
```



```
PS C:\Users\HP\Desktop\practice> cd "c:\Users\HP\Desktop\practice\" ; if ($?)
java.lang.ArithmeticException: / by zero
java.lang.ArrayIndexOutOfBoundsException: Index 3 out of bounds for length 3
File does not exist
PS C:\Users\HP\Desktop\practice>
```

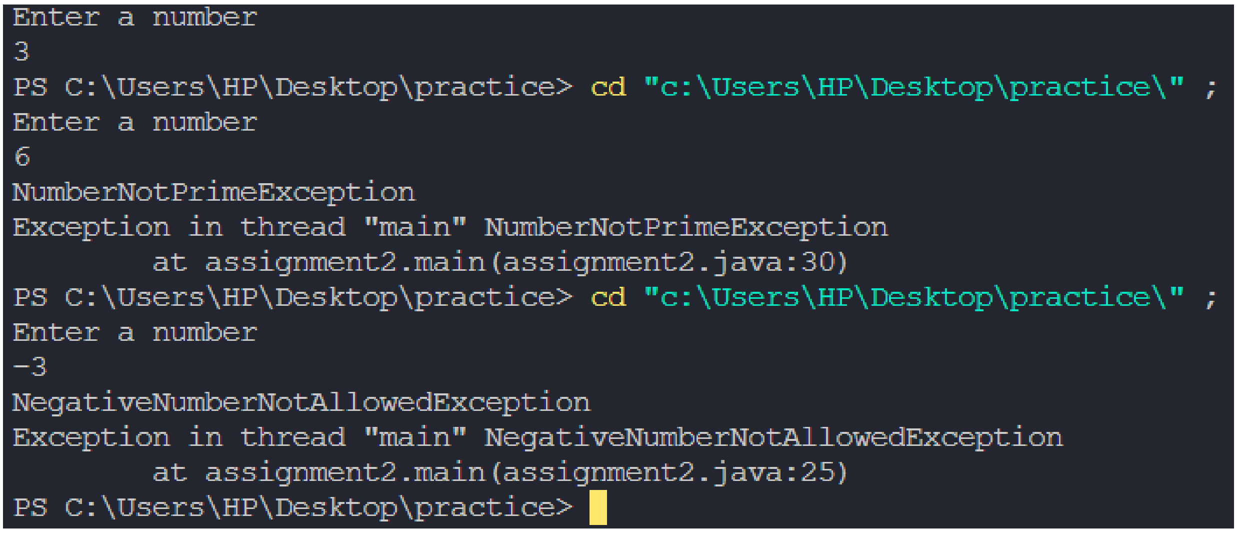
1. Problem definition:

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.

2. Java Program:

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

class NegativeNumberNotAllowedException extends Exception{
   NegativeNumberNotAllowedException(){
      System.out.println("NegativeNumberNotAllowedException");
   }
}

class NumberNotPrimeException extends Exception{
   NumberNotPrimeException(){
      System.out.println("NumberNotPrimeException");
   }
}

public class assignment2 {
   public static void main(String[] args) throws Exception{
      Scanner sc=new Scanner(System.in);

      System.out.println("Enter a number");

      int n=sc.nextInt();

      if(n<0){
         throw new NegativeNumberNotAllowedException();
      }

      for(int i=2; i<=Math.sqrt(n); i++){
         if(n%i==0){
            throw new NumberNotPrimeException();
         }
      }
   }
}
```

3. Output:



```
Enter a number
3
PS C:\Users\HP\Desktop\practice> cd "c:\Users\HP\Desktop\practice\" ;
Enter a number
6
NumberNotPrimeException
Exception in thread "main" NumberNotPrimeException
        at assignment2.main(assignment2.java:30)
PS C:\Users\HP\Desktop\practice> cd "c:\Users\HP\Desktop\practice\" ;
Enter a number
-3
NegativeNumberNotAllowedException
Exception in thread "main" NegativeNumberNotAllowedException
        at assignment2.main(assignment2.java:25)
PS C:\Users\HP\Desktop\practice> 
```

1. Problem definition:

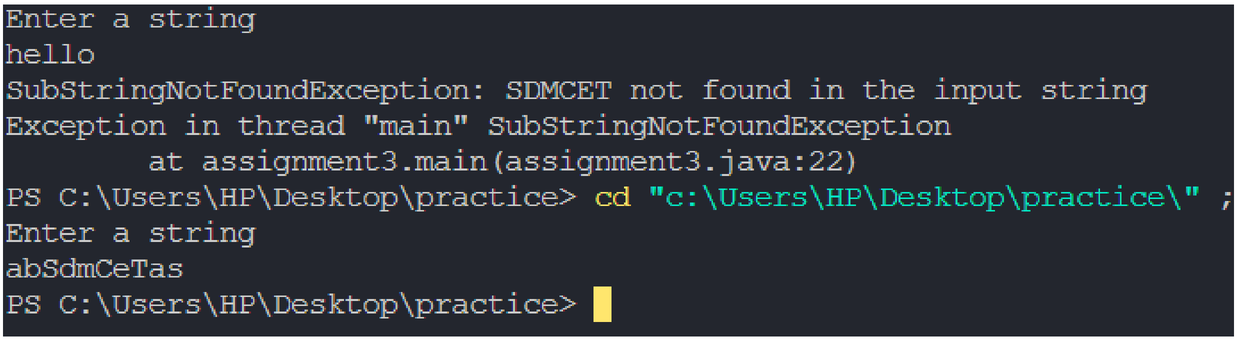
Write a Java program to perform the following operations:

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

2. Java Program:

```
import java.util.Scanner;

class SubStringNotFoundException extends Exception{
    SubStringNotFoundException(){
        System.out.println("SubStringNotFoundException: SDMCET not found in the input string");
    }
}

public class assignment3 {
    public static void main(String[] args) throws SubStringNotFoundException {
        Scanner sc=new Scanner(System.in);

        System.out.println("Enter a string");

        String input=sc.nextLine();

        String text=input.toUpperCase();

        int a=text.indexOf("SDMCET");

        if(a==-1){
            throw new SubStringNotFoundException();
        }
    }
}
```

3. Output:



```
Enter a string
hello
SubStringNotFoundException: SDMCET not found in the input string
Exception in thread "main" SubStringNotFoundException
        at assignment3.main(assignment3.java:22)
PS C:\Users\HP\Desktop\practice> cd "c:\Users\HP\Desktop\practice\" ;
Enter a string
abSdmCeTas
PS C:\Users\HP\Desktop\practice>
```

1. Problem definition:

Write a Java program to perform the following operations:

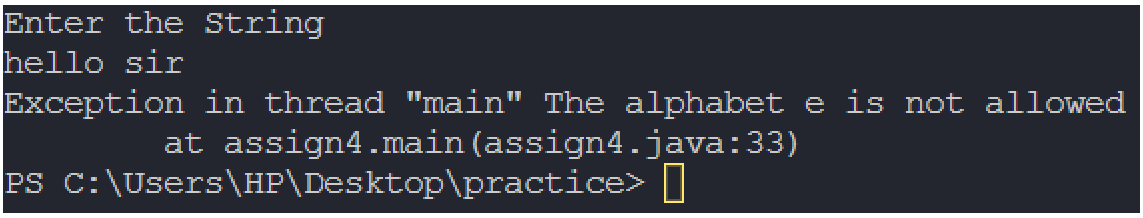
a) Create a file named Alphabets.txt and insert appropriate data into it
b) Read the file and copy all the consonants into another file named Consonants.txt
c) If vowel is encountered, throw an exception VowelNotAllowedException and continue until
end of file

2. Java Program:

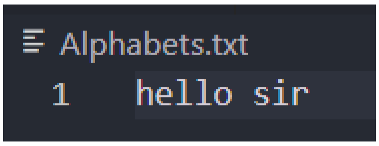
```
import java.io.*;
import java.util.Scanner;
import java.io.FileInputStream;
import java.io.FileOutputStream;


class VowelNotAllowedException extends Exception{
    char a;
    VowelNotAllowedException(char a){
        this.a=a;
    }
    public String toString(){
        return "The alphabet "+this.a+" is not allowed ";
     }
}
public class aoop4 {
    public static void main(String [] args) throws Exception{

        FileOutputStream f1=new FileOutputStream("Alphabets.txt");
        FileOutputStream fot=new FileOutputStream("Consonants.txt");
        FileInputStream fin = new FileInputStream("Alphabets.txt");
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter the String");
        String s=sc.nextLine();
        String s1=s.toLowerCase();

        int l=s1.length();
        for(int i=0;i<l;i++){
            char ch=s1.charAt(i);
            f1.write(ch);
```

```
                if(ch=='a'||ch=='e'||ch=='i'||ch=='o'||ch=='u'){
                    ss
                    continue;
                }
                else {
                    fot.write(ch);
                }

            }
            int n;
          while((n=fin.read())!=-1){
          char ch =(char) fin.read();
            if(ch=='a'||ch=='e'||ch=='i'||ch=='o'||ch=='u'){

                throw new VowelNotAllowedException(ch);
            }
          }

        System.out.println("Entered String contains only consonents");


       }

    }
```

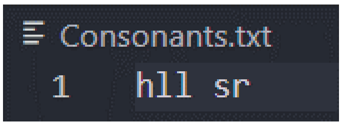
3. Output:



```
Enter the String
hello sir
Exception in thread "main" The alphabet e is not allowed
        at assign4.main(assign4.java:33)
PS C:\Users\HP\Desktop\practice> 
```



```
hello sir
```



```
hll sr
```

1. Problem definition:

Write a Java program to implement the following scenario:

a) Create a file named Integers.txt and insert n-random integers into it

b) Create three threads T1, T2 and T3 that read n/3 integers in sequence of occurrence of numbers from the file and sort the read n/3 integers

c) Thread T4 waits for all the threads T1, T2 and T3 to complete sorting, then sorts and outputs the entire list of sorted numbers to another file named SortedIntegers.txt

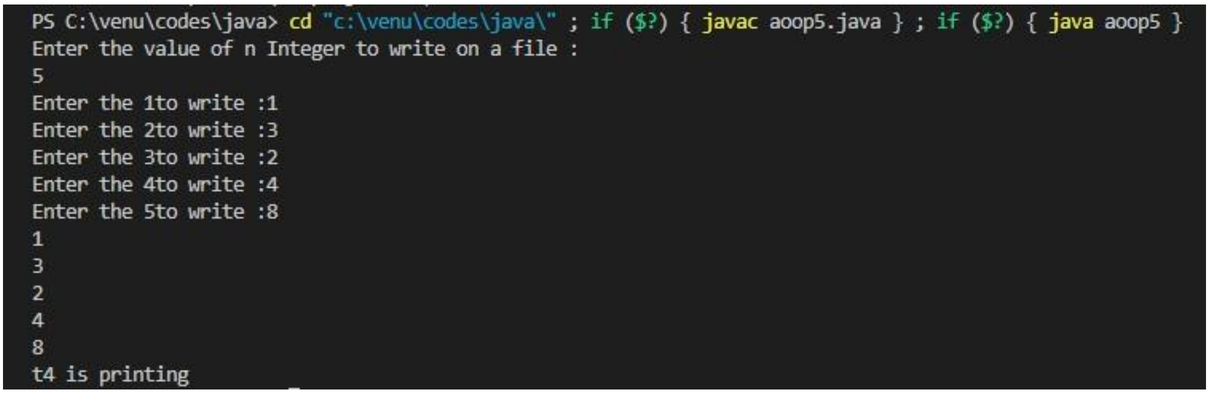
2. Java Program:

```
import java.util.*;
import java.util.Scanner;
import java.io.*;

public class Qq5 {
        public static void main(String[] args) {
                try{
                        FileWriter w = new FileWriter("Integer.txt");
                        Scanner sc= new Scanner(System.in);
                        System.out.println("Enter the value of n Integer to
write on a file :");
                        int n = sc.nextInt();
                        for (int i = 0; i < n; i++) {
                                System.out.print("Enter the " + (i + 1) + "to
write :" );
                                int input = sc.nextInt();
                                w.write(input + "\t");
                        }
                        w.close();
                        int i=0;
                        int arr[] = new int[n];
                        File file = new File("Integer.txt");
                        Scanner read = new Scanner(file);
                        while(read.hasNext()){
                                arr[i++] = Integer.valueOf(read.next());
                        }
                        Thread t1= new Thread(){
                                public void run(){
```

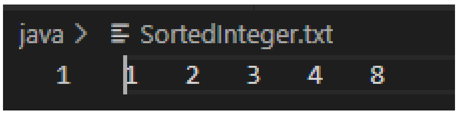
```
                    Arrays.sort(arr, 0, (arr.length/3));
                    for (int j = 0; j < (arr.length/3); j++) {
                        System.out.println(arr[j]);
                    }
                }
            };
            Thread t2= new Thread(){
                public void run(){
                    Arrays.sort(arr, (arr.length/3), 
(2*(arr.length/3)));
                    for (int j = (arr.length/3); j < 
(2*(arr.length/3)); j++) {
                        System.out.println(arr[j]);
                    }
                }
            };

            Thread t3= new Thread(){
                public void run(){
                    Arrays.sort(arr, (2*(arr.length/3)),(n-1));
                    for (int j = (2*(arr.length/3)); j < n; j++) {
                        System.out.println(arr[j]);
                    }
                }
            };
            Thread t4= new Thread(){
                public void run(){
                    Arrays.sort(arr);
                    StringBuilder s = new StringBuilder();
                    try{
                        FileWriter write =new 
FileWriter("SortedInteger.txt");
                        System.out.println("t4 is 
printing");
                        for (int j = 0; j < n; j++) {


    s.append(String.valueOf(arr[j]) + "\t");
                        }
                        write.write(s.toString());
                        write.close();
                    }catch (Exception e){
                        System.out.println(e);
                    }
                }
```

```
                        };

                        t1.start();
                        t1.join();
                        t2.start();
                        t2.join();
                        t3.start();
                        t3.join();
                        t4.start();
                }catch(Exception e){
                        System.out.println(e);
                        }
                }
        }
```

3. Output:



```
PS C:\venu\codes\java> cd "c:\venu\codes\java\" ; if ($?) { javac aoop5.java } ; if ($?) { java aoop5 }
Enter the value of n Integer to write on a file :
5
Enter the 1to write :1
Enter the 2to write :3
Enter the 3to write :2
Enter the 4to write :4
Enter the 5to write :8
1
3
2
4
8
t4 is printing
```



```
1   2   3   4   8
```