Question:

Write a program to implement the concept of Exception Handling using predefined exceptions.

Code :

```
// "static void main" must be defined in a public class.
import java.io.IOException;
import java.util.Scanner;
class printer {
   static void print(int arr[])throws IOException{
        Scanner sc = new Scanner(System.in);
        try {
            System.out.println("Please enter 10 values : ");
            for(int i = 0 ; i < 10; i++) {
                arr[i] = sc.nextInt();
            }
            if(arr[0] >= 100) throw new IOException();
            System.out.println("Please enter 2 index to divide element at
that Index : ");
            int idx1 = sc.nextInt();
            int idx2 = sc.nextInt();
            int ans = arr[idx1]/arr[idx2];
            System.out.println("dividing element at index "+idx1+" by
element at index "+idx2+"we get = "+ans);

        }
        catch(ArrayIndexOutOfBoundsException e) {
            System.out.println("CATCHES OUT OF BOUNDS EXCEPTION " +e);
        }
        catch(ArithmeticException e) {
            System.out.println("CATCHES ARITHMETIC EXCEPTION " +e);
        }
        finally {
            System.out.println("finally will always be executed ");
        }
        System.out.println("size of the array is = "+10);

   }
}
public class createexception {
```

```
    public static void main(String[] args) throws IOException{

        Scanner sc = new Scanner(System.in);
        int arr[] = new int[10];

        printer.print(arr);
    }
}

/*
    TO TEST ARRAY OUT OF BOUNDS EXCEPTION I/P
    1 2 3 4 5 6 7 8 9 0
    11 12

    TO TEST ARITHMETIC EXCEPTION I/P
    1 2 3 4 5 6 7 8 9 0
    1 9

    TO TEST UNHANDLED EXCEPTION I/P
    a 2 3 4 5 6 7 8 9 0

    TO TEST THROWS IO EXCEPTION I/P
    100 1 2 3 4 5 6 7 8 10

*/
```

Output :

Array index out of bound exception:

```
Please enter 10 values :
1 2 3 4 5 6 7 8 9 10
Please enter 2 index to divide element at that Index :
11 12
CATCHES OUT OF BOUNDS EXCEPTION java.lang.ArrayIndexOutOfBoundsException: Index 11 out of bounds for length 10
finally will always be executed
size of the array is = 10
```

Manually thrown IO exception:

```
Please enter 10 values :
190 200 300 221 123 310 913 312 98 89
finally will always be executed
Exception in thread "main" java.io.IOException
        at printer.print(day10eception.java:11)
        at day10eception.main(day10eception.java:38)
```

Arithmetic exception:

```
Please enter 10 values :
1 2 3 4 5 6 7 8 9 0
Please enter 2 index to divide element at that Index :
1 9
CATCHES ARITHMETIC EXCEPTION java.lang.ArithmeticException: / by zero
finally will always be executed
size of the array is = 10
```

Unhandled Exception:

```
Please enter 10 values :
a 2 3 4 5 6 7 8 9 10
finally will always be executed
Exception in thread "main" java.util.InputMismatchException
        at java.base/java.util.Scanner.throwFor(Scanner.java:939)
        at java.base/java.util.Scanner.next(Scanner.java:1594)
        at java.base/java.util.Scanner.nextInt(Scanner.java:2258)
        at java.base/java.util.Scanner.nextInt(Scanner.java:2212)
```

Question:

Write a program to implement the concept of Exception Handling by creating user defined exceptions.

NOTE: Use throws, throw, try, catch and finally keywords in your program.

Code:

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

class MyException extends Exception {
   public String toString() {
       return "Wrong password";
   }
}

class Checker {
   static void check(String userName, int password) throws IOException {
       try {
           if (userName.equals("admin") && password == 12345) {
               System.out.println("You are now logged in as: " +
userName);
           } else {
```

```
                throw new MyException();
            }
            if (password > 12345) {
                throw new IOException();
            }
        } catch (MyException e) {
            System.out.println("Please enter correct password: " + e);
        } finally {
            System.out.println("Finally block always printed");
        }
        System.out.println("Username = " + userName + ", Password = " +
password);
    }
}

public class CreateException2 {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        String userName;
        int password;

        System.out.println("Enter the Username: ");
        userName = sc.next();
        System.out.println("Enter the Password: ");
        password = sc.nextInt();

        try {
            Checker.check(userName, password);
        } catch (IOException e) {
            System.out.println("IO Exception occurred: " + e);
        }
    }
}
```

Output:

MyException (User defined Exception) prints wrong password:

```
Enter the Username:
admin
Enter the Password:
1234
Please enter correct password: Wrong password
Finally block always printed
Username = admin, Password = 1234
```

When correct password is entered Finallyblock is printed along with rest of the program :

```
Enter the Username:
admin
Enter the Password:
12345
You are now logged in as: admin
Finally block always printed
Username = admin, Password = 12345
```

Using throws to generate IOException Manually handled at main funtion :

```
Enter the Username:
admin
Enter the Password:
123456
Please enter correct password: Wrong password
Finally block always printed
Username = admin, Password = 123456
```