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Assignment -13
(Exception Handling and package)

1. Get an input string from user and parse it to integer, if it is not a number it will throw number exception catch it and print "Entered input is not a valid format for an integer" or else print the square of that number.

2. write a program that takes as input the size of the array and the elements in the array. The program then asks the user to enter a particular index and prints the element at that index. This program may generate Array Index out of Bounds EXception. use exception handling mechanisms to handle this exception. In the catch block, print the class name of the exception thrown

3. write a program that takes as input the size of the array and the elements in the array. The program then asks the user to enter a particular index and prints the element at that index. Index starts from zero. This program may generate Array Index out of Bounds Exception or NumberFormatEXception. use exception handling mechanisms to handle this exception.

4. write a program to create a package shape that contains to classes Rectangle and square. These classes contains methods to receive input and calculates area and perimeter of the shapes. use both the class in another class, calculate and print the area and perimeter.

5. write a program to create a package arithmetic that contains classes multiplication and division. These classes contains method for calculating multiplication and division of 2 integers and double numbers. use both the class in another class, calculate and print the results.

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Answer

1
```
import java.lang.*;
import java.util.*;
Public class NumberException {
    public static void main (String args[]){
        Scanner sc = new Scanner (System.in);
        String input;
        System.out.print (" Enter a number :- ");
        input = sc.nextLine();
        try {
            int n = Integer.parseInt (input);
            System.out.println ("The square of "+ n + " is "+
                                (n*n));
        }
        catch (NumberFormatException e) {
            System.out.println("Entered input is not a valid
                                format for an integer.");
        }
        sc.close();
    }
}
```

Output :-

Enter a number :- 5
The square of 5 is 25

Output (Error) :-

Enter a number :- R
Entered input is not a valid format for an integer.

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2
```
import java.lang.*;
import java.util.*;
public class IndexException {
    public static void main(String args[]){
        Scanner sc = new Scanner (System.in);
        System.out.print("Enter the size of the array :-");
        int size = sc.nextInt();
        int arr[] = new int [size];
        System.out.println ("Enter " + size + " elements :- ");
        for (int i=0 ; i<size; i++){
            arr[i] = sc.nextInt();
        }
        System.out.print ("Enter an index to access :- ");
        int index = sc.nextInt();
        try {
            System.out.println ("Element at index " + index
                    + " is " + arr [index]);
        }
        catch (ArrayIndexoutofBoundsException e) {
            System.out.println ("Error :-
                    ArrayIndexOutOfBoundsException");
        }
        sc.close();
    }
}
```

output :-

```
Enter the size of the array :- 2
Enter 2 elements :-
1
2
Enter an index to access :- 1
Element at index 1 is 2
```

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output (with error):-

```
Enter the size of the array :- 2
Enter 2 elements:-
1
2
Enter an index to access :- 5
Error :- ArrayIndexOutOfBoundsException
```

3
```
import java.lang.*;
import java.util.*;
Public class IndexAndNumberException {
    Public static void main (String args[]) {
        Scanner sc = new Scanner (System.in);
        System.out.Print("Enter the size of the array :-");
        int arr[] = new int Siz
        int size = sc.nextInt();
        int arr[] = new int [size];
        System.out.println("Enter " + size + " elements :-");
        for (int i = 0; i < size; i++) {
            arr[i] = sc.nextInt();
        }
        System.out.print("Enter an index to access :-");
        sc.nextLine();
        try {
            int index = Integer.parseInt (sc.nextLine());
            System.out.println("Element at index " + index +
                    " is " + arr[index]);
        }
        catch (ArrayIndexOutOfBoundsException e) {
            System.out.println("Error :- ArrayIndexOutOfBounds
                                    Exception");
        }
```

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```
        catch(NumberFormatException e){
            System.out.println("Error :- NumberFormatException");
        }
        sc.close();
    }
}
```

output :-

```
Enter the size of the array :- 2
Enter 2 elements :-
1
2
Enter an index to access :- 1
Element at index 1 is 2
```

output (with error) :-

```
Enter the size of the array :- 2
Enter 2 elements :-
1
2
Enter an index to access :- 5
Error :- ArrayIndexOutOfBoundsException
```

output (with error) :-

```
Enter the size of the array :- 2
Enter 2 elements :-
1
2
Enter an index to access :- R
Error :- NumberFormatException
```

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4 //Rajesh/shape/Rectangle.java

```
Package Rajesh.shape;
Public class Rectangle {
    Public int area (int l, int b) {
        return (l*b);
    }
    Public int perimeter (int l, int b) {
        return 2*(l+b));
    }
}
```

//Rajesh/shape/Savarce.java

```
Package Rajesh.shape;
Public class savare {
    Public int area (int r) {
        return (r*r);
    }
    public int perimeter (int r) {
        return (4*r);
    }
}
```

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```
//ShapeCalc.java
import java.lang.*;
import java.util.*;
import Rajesh.Shape.Rectangle;
import Rajesh.Shape.Square;

public class ShapeCalc {
    public static void main(String args[]){
        Scanner sc = new Scanner(System.in);
        Rectangle rect = new Rectangle();
        Square sq = new Square();

        System.out.print("Enter length of the rectangle:-");
        int l = sc.nextInt();
        System.out.print("Enter breadth of the rectangle:-");
        int b = sc.nextInt();
        System.out.println("Area of Rectangle :- "+
                           rect.area(l,b));
        System.out.println("Perimeter of Rectangle :-"+
                           rect.perimeter(l,b));

        System.out.print("\nEnter side of square :-");
        int s = sc.nextInt();
        System.out.println("Area of square :-"+sq.area(s));
        System.out.println("Perimeter of square :-"+
                           sq.perimeter(s));

        sc.close();
    }
}
```

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output :-

```
Enter length of the rectangle :- 2
Enter breadth of the rectangle :- 2
Area of Rectangle :- 4
Perimeter of Rectangle :- 8

Enter side of square :- 5
Area of square :- 25
Perimeter of square :- 20
```

5 //Rajesh/arithmetic/multiplication.java

```
package Rajesh.arithmetic;
public class multiplication {
    public int multiply(int a, int b){
        return a*b;
    }
    ~~public double multiply int~~
    public double multiply (double a, double b){
        return a*b;
    }
}
```

//Rajesh/arithmetic/Division.java

```
package Rajesh.arithmetic;
public class Division {
    public int divide (int a, int b){
        return a/b;
    }
```

```
    public double divide (double a, double b) {
        return a/b;
    }
}
```

```
//Calculator.java

import java.lang.*;
import java.util.*;
import Rajesh.arithmetic.*;
public class Calculator {
    public static void main (String args[]) {
        Scanner sc = new Scanner (System.in);
        multiplication mul = new multiplication ();
        Division div = new Division ();

        System.out.print ("Enter first number (int) :- ");
        int a = sc.nextInt();
        System.out.print ("Enter second number (int) :- ");
        int b = sc.nextInt();
        System.out.println ("multiplication of " + a + " and "
                + b + " is " + mul.multiply (a,b));
        System.out.println ("Division of " + a + " and " + b +
                " is " + div.divide (a,b));


        System.out.print ("\nEnter first number (double) :- ");
        double x = sc.nextDouble();
        System.out.print ("Enter second number (double) :- ");
        double y = sc.nextDouble();
```

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```
System.out.println("Multiplication of "+x+"and"
        +y+ "is"+mul.multiply(x,y));
System.out.println("Division of "+x+"and"+y+
        "is"+div.divide(x,y));

sc.close();
    }
}
```

Output:-

Enter first number (int) :- 10
Enter second number (int):- 5
multiplication of 10 and 5 is 50
Division of 10 and 5 is 2

Enter first number (double) :- 4.0
Enter second number (double) :- 0.0
multiplication of 4.0 and 0.0 is 0.0
Division of 4.0 and 0.0 is Infinity