

FIRST TASK

Exercise 1: Array manipulation.

Objective: To identify and fix errors in a java program that manipulates arrays.

Solution:-

```
public class Arraymanipulation
{
    public static void main(String[] args)
    {
        int numbers[] = {1,2,3,4,5};

        for(int i=0;i<numbers.length;i++)
        {
            System.out.println(numbers[i]);
        }
    }
}
```

Explantation:-

- In the provided java program there is an error in for loop condition within the 'main' method.
 - The loop condition should be '<' instead of '<=' because array indices start with 0 and end at n-1.
 - When we are declaring loop condition '<=' then iteration of loop are taking extra memory space that is cause of arise an exception that is 'ArrayIndexOutOfBoundsException' .
 - To avoid this exception we should to declare loop condition '<' instead of '<='.
 - The loop iterate from '0' to 'numbers-1' printing each element of the 'numbers' array.
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Exercise 2: Object-Oriented Programming.

Objective: To identify and fix error in a java program that demonstrates basic object-oriented programming principles.

Solution:-

```
class Car
{
    private String make;
    private String model;

    public Car(String make,String model)
    {
        this.make=make;
    }
}
```

```

        this.model=model;
    }
    public void start()
    {
        System.out.println("Starting the car.");
    }
    public void stop()
    {
        System.out.println("Stoping the car.");
    }
}
public class Main
{
    public static void main(String[] args)
    {
        Car car=new Car("Toyota", "Camry");
        car.start();
        car.stop();
    }
}

```

Explantation:-

- In the provided program, there is an error in the **'Main'** class because the **'stop()'** method is not declare in the car class that is why we are getting an error.
 - To fix the error in a program we need to write a **'stop()'** method In **'car'** class.
 - I added a **'stop()'** method to the **'car'** class, which allows for calling **'car.stop()'** in the **'Main'** class without encountering an errors.
 - The **'stop()'** simply prints a message indicating that car is stopping.
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Exercise 3: Exception Handling.

Objective: To identify and fix errors in a java program that demonstrates exception Handling.

Solution:-

```

public class ExceptionHandling
{
    public static void main(String[] args)
    {

        int[] numbers= {1,2,3,4,5};
        try
        {

```

```

        System.out.println(numbers[10]);
    }
    catch (ArrayIndexOutOfBoundsException e)
    {
        System.out.println("Array index out of
bounds.");
    }
    try
    {
        int result=divide(10,0);
        System.out.println("result:"+result);
    }
    catch (ArithmeticException e)
    {
        System.out.println("Arithmetic exception ");
    }
}

public static int divide(int a,int b)
{
    return a/b;
}
}

```

Explantation:-

- In this program, there is an exception occur (**'ArithmeticException'**) when we are running the program.
 - This exception occur because when we are divide any number (except 0) with 0 there is chance of error.
 - To avoid these exceptions to add **'try-catch'** block around the division operation.
 - **'Try'** block find the error from the piece of code and **'catch'** block handle the exception.
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Exercise 4:

Objective: Calculate the Fibonacci sequence.

```

public class Fibonacci
{
    public static int fibonacci(int n)
    {
        if (n<=1)

```

```

        else
            return (fibonacci(n-1)+fibonacci(n-2));
    }
    public static void main(String[] args)
    {
        int n=6;
        int result=fibonacci(n);
        System.out.println("the fibonacci number at
position " + n + " is " + result);
    }
}

```

Explanation:-

- In the problem, There is no any error that I can encounter.
- When I wrote this program and tried to run it, it was performing well and giving correct output that is '8'.
- I have also looked at base case I can't find any kind of error and exception.
- I requested to you that if this program has contains any kind of error and exception which I am not able to find out, please show me the way forward.

Exercise5:

Objective: To find the prime number.

```

import java.util.*;

public class primeNumber
{
    public static List<Integer>findPrimes(int n)
    {
        List<Integer>primes=new ArrayList<>();
        for(int i=2;i<=n;i++)
        {
            boolean isPrime=true;
            for(int j=2;j<i;j++)
            {
                if(i%j==0)
                {
                    isPrime=false;
                    break;
                }
            }
        }
    }
}

```

```

        if(isPrime)
        {
            primes.add(i);
        }
    }
    return primes;
}

public static void main(String[] args)
{
    int n=20;
    List<Integer>primeNumbers=findPrimes(n);
    System.out.println("prime numbers up to
"+n+": "+primeNumbers);
}
}

```

Explanation:

- In the problem, There is no any error that I can encounter.
- When I wrote this program and tried to run it, it was performing well and giving correct output that is '[2,3,5,7,11,13,17,18]'.
- I have also looked at condition for checking prime numbers, I can't find any kind of error and exception.
- I requested to you that if this program has contains any kind of error and exception which I am not able to find out, please show me the way forward.

Task Completed