After each exception here I give the code in order to catch this exception that would display a message as the reason for this exception being thrown. In the first case the nullpointer exception is being thrown because we are adding a null value to an actually number so it throws that exception. The exception shown is the array index out of bounds and this occurs due to when a program tries to access an array and the length is either negative, greater than or equal to the length of the array. The next exception that was created was the class cast exception and this error occurs due to casting an object to a subclass that is not an instance. Last exception thrown program designed here is the illegal argument exception and this occurs when the argument is out of range like the example x is suppose to be less than 100 but I have the program setting x to 101 so it gives this exception.

```java
public class NullPointerExceptionThrown
{
    public static void main(String [] args)
    {
        Integer num = null;
        Integer num2 = 5;
        System.out.println(num + num2);
    }
}
```

```java
public class NullPointerExceptionCatch
{
    public static void main(String[] args)
    {
        try
        {
            Integer num = null;
            Integer num2 = 5;
            System.out.println(num + num2);
        }
        catch (Exception e) {
            System.out.println("NullPointerException caught: " + "\n"
                    + " Exception was thrown because while putting num and num2
together the num was a null value");
        }
    }
}
```

```java
public class ArrayIndexOutOfBoundsExceptionThrown
{
 public static void main(String []args)
 {
    String[] animals = {"cat", "dog"};
    for (int i = 2; i <= animals.length; i++)
    {
```

```java
            System.out.println(animals[i]);
        }
    }
}
```

```

}
```

```java
public class ArrayIndexOutOfBoundsExceptionCatch
{
    public static void main(String []args)
    {
        try
        {
            String[] animals = {"cat", "dog"};
            for (int i = 2; i<=animals.length; i++)
            {
                System.out.println(animals[i]);
            }
        } catch (Exception e) {
            System.out.println("ArrayIndexOutOfBounds caught: " + "\n"
                    + " Exception was thrown because the array was accessed by an
illegal index because it was greater than the size of the array");
        }
    }
}
```

```java
public class ClassCastExceptionThrown
{
    public static void main(String[]args)
    {
        Object exception = new Integer(42);
        System.out.println((String)exception);
    }
}
```

```java
public class ClassCastExceptionCatch
{
    public static void main(String[]args)
    {
        try
        {
            Object exception = new Integer(42);
            System.out.println((String)exception);
        } catch (Exception e) {
            System.out.println("ClassCast Exception caught: " + "\n"
                + " Exception was thrown because it casting exception as a string");
        }
    }
}
```

```
}
```
```
ClassCast Exception caught:
 Exception was thrown because it casting exception as a string
```

```java
public class IllegalArgumentExceptionThrown
{
    public static void main(String[]args)
    {
        int x = 101;
        if (x < 100)
        {
            System.out.println("X is less than 100");
        }
        else
        {
            throw new IllegalArgumentException();
        }
    }
}
```
```
Exception in thread "main" java.lang.IllegalArgumentException
        at IllegalArgumentExceptionThrown.main(IllegalArgumentExceptionThrown.java:11)
```

```java
public class IllegalArgumentExceptionCatch
{
    public static void main(String[]args)
    {
        try
        {
            int x = 101;
            if (x < 100)
            {
                System.out.println("X is less than 100");
            }
            else
            {
                throw new IllegalArgumentException();
            }
        }catch (Exception e)
        {
            System.out.println("IllegalArgument Exception caught: " + "\n"
                + " Exception was thrown because the value of x was not less than 100
so it was an illegal argument");
        }
    }
}
```

```
IllegalArgument Exception caught:
 Exception was thrown because the value of x was not less than 100 so it was an illegal argument
```