Assignment: Understanding Java Built-in Functions

Objective:

The purpose of this assignment is to explore and demonstrate the use of some common built-in functions in Java.

Instructions:

1. Write a Java program that demonstrates the usage of the following built-in functions:
   - Math.pow()
   - String.length()
   - Arrays.sort()
   - Integer.parseInt()
   - String.toUpperCase()

2. For each function:
   - Explain its purpose and how it works.
   - Implement a small example where the function is used effectively.

Example:

1. Math.pow():

   - Purpose: This function is used to calculate the power of a number. It returns the value of the first argument raised to the power of the second argument.

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

```
        double base = 2;
        double exponent = 3;
        double result = Math.pow(base, exponent);
        System.out.println("2 raised to the power of 3 is: " + result);
    }
}
```

2. String.length():

- Purpose: This method returns the length of a string (number of characters).

```
public class StringLengthExample {
    public static void main(String[] args) {
        String str = "Hello, World!";
        int length = str.length();
        System.out.println("The length of the string is: " + length);
    }
}
```

3. Arrays.sort():

- Purpose: This function is used to sort the elements of an array in ascending order.

```
import java.util.Arrays;

public class ArraySortExample {
    public static void main(String[] args) {
        int[] numbers = {5, 3, 8, 1, 2};
        Arrays.sort(numbers);
```

```
        System.out.println("Sorted array: " + Arrays.toString(numbers));
    }
}
```

4. Integer.parseInt():

- Purpose: This function converts a string to an integer.

```
public class ParseIntExample {
    public static void main(String[] args) {
        String number = "123";
        int result = Integer.parseInt(number);
        System.out.println("The integer value is: " + result);
    }
}
```

5. String.toUpperCase():

- Purpose: This method converts all characters in a string to uppercase.

```
public class UpperCaseExample {
    public static void main(String[] args) {
        String str = "hello world";
        String upperStr = str.toUpperCase();
        System.out.println("Uppercase string: " + upperStr);
    }
}
```

More Built-in Functions:

6. Math.sqrt():

- Purpose: This method returns the square root of a number.

```
public class SqrtExample {
    public static void main(String[] args) {
        double number = 16;
        double result = Math.sqrt(number);
        System.out.println("The square root of 16 is: " + result);
    }
}
```

7. String.substring():

- Purpose: This method extracts a substring from a string.

```
public class SubstringExample {
    public static void main(String[] args) {
        String str = "Hello, World!";
        String subStr = str.substring(7, 12);
        System.out.println("The extracted substring is: " + subStr);
    }
}
```

8. Math.random():

- Purpose: This method generates a random number between 0.0 and 1.0.

```
public class RandomExample {
```

```
    public static void main(String[] args) {
        double randomNumber = Math.random();
        System.out.println("A random number: " + randomNumber);
    }
}
```

9. String.equals():

- Purpose: This method compares two strings for equality.

```
public class EqualsExample {
    public static void main(String[] args) {
        String str1 = "Java";
        String str2 = "java";
        boolean isEqual = str1.equals(str2);
        System.out.println("Are the two strings equal? " + isEqual);
    }
}
```

10. Character.isDigit():

- Purpose: This method checks if a character is a digit.

```
public class IsDigitExample {
    public static void main(String[] args) {
        char ch = '5';
        boolean isDigit = Character.isDigit(ch);
        System.out.println("Is the character a digit? " + isDigit);
    }
```

```
}
```