BASIC JAVA GUIDE

History of Java

- Java's first name was Oak.

General Features of Object-Oriented Languages

- //: Used for single-line comments.

- /* */: Used to comment out a specific block of text.

Arithmetic Operators

- +: Addition (e.g., number1 + number2)

- -: Subtraction (e.g., number1 - number2)

- *: Multiplication (e.g., number1 * number2)

- /: Division (e.g., number1 / number2)

- %: Modulus (e.g., number1 % number2)

Logical Operators

- &&: AND (Both variables must be TRUE.)

- ||: OR (At least one variable must be TRUE.)

- !: NOT (If the variable is FALSE, it becomes TRUE.)

Relational Operators

- ==: Equals? (e.g., a == b)

- !=: Not equal? (e.g., a != b)

- <: Less than? (e.g., a < b)

- >: Greater than? (e.g., a > b)

- <=: Less than or equal to? (e.g., a <= b)

- >=: Greater than or equal to? (e.g., a >= b)

Increment and Decrement Operators

- a++: Uses the current value, then increments.

- ++a: Increments first, then uses the value.

- a--: Uses the current value, then decrements.

- --a: Decrements first, then uses the value.

Example:

```
int a = 5;
System.out.println(a++); // Output: 5
System.out.println(a);   // Output: 6
System.out.println(++a); // Output: 7
```

Variables

- Letters, digits, and underscore (_) characters can be used, but variables cannot start with a digit.

- Java is case-sensitive.

- Keywords cannot be used as variable names.

Data Types:

1. Primitive Types: byte, short, int, long, float, double, char, boolean

2. Reference Types: Classes, arrays, and other objects.

Control Structures

if - else - else if:

```
if (x > 100) {
  System.out.println("X is greater than 100");
```

```
} else {
  System.out.println("X is less than or equal to 100");
}
```

Switch Case:

```
int day = 5;
switch (day) {
  case 1: System.out.println("Monday"); break;
  case 2: System.out.println("Tuesday"); break;
  case 5: System.out.println("Friday"); break;
  default: System.out.println("Error");
}
```

Loops

- For:

```
for (int i = 0; i < 10; i++) {
  System.out.println("Hello World");
}
```

- While:

```
int i = 1;
while (i <= 5) {
  System.out.println(i);
  i++;
}
```

- Do-While:

```
int i = 1;
do {
  System.out.println(i);
  i++;
} while (i <= 5);
```

Arrays

Single-Dimensional Array:

```
int[] numbers = {10, 20, 30};
```

```
System.out.println(numbers[0]); // Output: 10
```

Two-Dimensional Array:

```
int[][] matrix = {{1, 2}, {3, 4}};
System.out.println(matrix[1][0]); // Output: 3
```

Mathematical Functions

- Square Root: Math.sqrt(16)

- Power: Math.pow(2, 3)

- Absolute Value: Math.abs(-5)

- Rounding: Math.round(3.6)

- Trigonometry: Math.sin(Math.toRadians(30))

Taking Input from Keyboard

Using the Scanner Class:

```
import java.util.Scanner;

Scanner sc = new Scanner(System.in);
System.out.print("Enter a number: ");
int number = sc.nextInt();
System.out.println("Entered number: " + number);
```