Anatomy of a Java Function

A function in Java is a block of code that performs a specific task.

How to Code a Function in Java

Functions in Java can either return a value or not, depending on their purpose.

Function with a Return Value

A function that returns a value has the following syntax:

```java
ReturnType functionName() {
    // Code to perform the task
    return value;
}
```

- **ReturnType**: Specifies the type of value the function will return (e.g., `int`, `double`, `String`, `Date`, etc.).
- **functionName**: The name you assign to the function.

Function Without a Return Value

In Java, if a function does not return any value, it is declared with the keyword `void`:

```java
void functionName() {
    // Code to perform the task
}
```

- **void** is a reserved keyword in Java, used to indicate that the function does not return a value.

Key Steps to Define a Function

1. **Name**: Choose a name for the function that describes its purpose.
2. **Parameters**: Enclose parameters within parentheses `()` to pass values into the function (parameters are optional).
3. **Braces**: Use curly braces `{}` to define the block of code. The opening brace `{` should be on the same line as the function name.

Example:

```java
void sendEmail() {
    // Code to send an email
}
```

The `main()` Function

Every Java program must contain at least one function, and that function is typically named `main()`. The `main()` function is the entry point to the program:

- When a Java program is executed, the `main()` function is called, and the code inside it runs.
- The `main()` function doesn't exist independently; it always belongs to a **class**.

Example of a `main()` function:

```java
public static void main(String[] args) {
    // Code to execute when the program starts
}
```

The `class` as a Container for Related Functions

A class in Java is used to organize related functions, similar to sections in a supermarket where related products are grouped together. Every Java program should contain at least one class that holds the `main()` function. Functions within classes are called methods.

To create a class, use the `class` keyword followed by a meaningful name. Inside the class, define the methods.

Example:

```java
class Main {
    public static void main(String[] args) {
        // Code to execute when the program starts
    }
}
```

Naming Conventions in Java

In Java:

- **Classes** follow the PascalNamingConvention, where the first letter of every word is uppercase.
- **Methods** use camelNamingConvention, where the first letter of every word is uppercase except for the first word.