Difference between switch and else-if statements

The main difference between a switch case statement and an else-if ladder is the way they handle multiple conditions and execute corresponding code blocks.

Switch case: A switch case statement is a control structure that evaluates an expression and matches its value against a series of cases. It provides a concise way to handle multiple possibilities. Here's how it works:

- The expression is evaluated once.
- The evaluated value is compared to each case value sequentially.
- If a match is found, the code block corresponding to that case is executed.
- If no match is found, an optional default case can be executed.

Syntax:

```
int option = 2;

switch (option) {
    case 1:
        // Code block executed if option equals 1
        break;
    case 2:
        // Code block executed if option equals 2
        break;
    case 3:
        // Code block executed if option equals 3
        break;
    default:
        // Code block executed if option doesn't match any case
        break;
}
```

Else-if ladder: An else-if ladder, also known as a chain of if-else statements, is a series of conditions evaluated one after the other. It provides a flexible way to handle multiple conditions and allows more complex logic to be implemented. Here's how it works:

- Each condition is evaluated sequentially.
- If a condition evaluates to true, the corresponding code block is executed, and the rest of the ladder is skipped.
- If none of the conditions are true, an optional else block can be executed as a default case.

Syntax:

```
int option = 2;

if (option == 1) {
    // Code block executed if option equals 1
} else if (option == 2) {
    // Code block executed if option equals 2
} else if (option == 3) {
    // Code block executed if option equals 3
} else {
    // Code block executed if none of the conditions are true
}
```

Key differences:

- Syntax: Switch case uses the `switch` keyword followed by cases, whereas an else-if ladder uses a series of `if`, `else if`, and `else` statements.
- Comparison: Switch case matches the evaluated value with case values using the `==` operator, while else-if ladder allows for more complex conditions.
- Execution: Switch case executes the code block corresponding to the matched case, whereas else-if ladder executes the first true condition's code block and skips the rest.
- Default case: Switch case provides a default case that is executed when no match is found, whereas an else-if ladder uses an optional else block to handle the default case.

In general, switch case is more suitable when you have a fixed set of values to compare against, while an else-if ladder is more flexible and can handle more complex conditions. The choice between the two depends on the specific requirements of your program.