Decision Making

By: **Annamalai A**

This part is there everywhere in our lives, and is required for any sort of computational task. So how do we tell a computer to make decisions? Simple. The `if...else` block in C is used to make decisions and act upon it based on the state of the passed condition. The structure looks something like this:

```
if (/* Main condition */) {
    /* Block to be executed if condition is true */
}

else if (/* Next condition */) {
    /* Block to be executed if this condition is true */
}

...

else {
    /* Block to be executed if all the conditions provided above are false */
```

Now let's look at an example. Consider we are given a data consisting of the age of a group of people and we should say if each person comes under the baby, child, teenage, adult or elderly category. We can classify them based on these conditions:

If the person is of age:

- 0 - 3: Baby
- 4 - 12: Child
- 13 - 19: Teenage
- 20 - 59: Adult
- 60+: Elderly

```
#include <stdio.h>
```

```
int main() {
    int n;
    printf("Enter your age: ");
    scanf("%d", &n);

    if (n < 0)
        printf("Invalid age");
    if (n >= 0 && n <= 3)
        printf("Baby");
    else if (n >= 4 && n <= 12)
        printf("Child");
    else if (n >= 13 && n <= 19)
        printf("Teenage");
    else if (n >= 20 && n <= 59)
        printf("Adult");
    else
        printf("Elderly");
    printf("\n");

    return 0;
}
```

The following code does exactly what we want. If the age is valid, it classifies based on the condition provided, otherwise says the age is invalid. Also note that there are no `{}` around the blocks. This can be valid *only* if there is one statement inside the block.

Nested `if...else` blocks

Sometimes, it can be noticed that a task has multiple decisions branching before reaching the final solution. For example, let's say we have a choice between studying and playing. This is one decision. Let's say we opt to study. Now we have to make decision about what to study. This is the next decision.

When it comes to programming this, it is straight forward. Just create another `if...else` block inside the main `if...else` block.

```
if (a > 0) {
    if (a % 2 == 0) {
```

```
        printf("Positive even");
    } else {
        printf("Positive odd");
    }
} else if (a < 0) {
    if (a % 2 == 0) {
        printf("Negative even");
    else {
        printf("Negative odd");
    }
}
```

The given code checks it the number is positive or negative and odd or even and prints the result. Also note that the final `else` block is not always required. But every `else` or `else if` block requires an `if` block before it.