

AP CSP LESSONS 9-11

**Adapted from Code.org Curriculum
PowerPoint made by students in 2017**

LESSON 9: IF-ELSE-
IF AND
CONDITIONAL LOGIC

IF ELSE IF STATEMENTS

Goal: to understand selection, specifically if else if statements.

- If, else, and boolean expressions do not change even if they're inside another expression or function.
- You can chain if else statements together, creating if else if statements.

&&, ||, AND !

- `&&` is an “and” statement
 - The `&&` operator means that both of the statements being compared must be true to return true.
- `||` is an “or” statement
 - “or” is the inclusive or. The `||` operator means that at least one of the statements being compared must be true to return true, or it returns false.
- `!` is a “not” statement

IF-ELSE-IF

- You can use these the `&&` and `||` operators to compare statements, putting in a true or false value into the if else if statements.
- An if else statement is an example of a conditional statement. This means that the if statement code will only run if a certain condition is met, if the given condition is not met, a different set of code will run.

STRUCTURE OF IF ELSE IF STATEMENTS

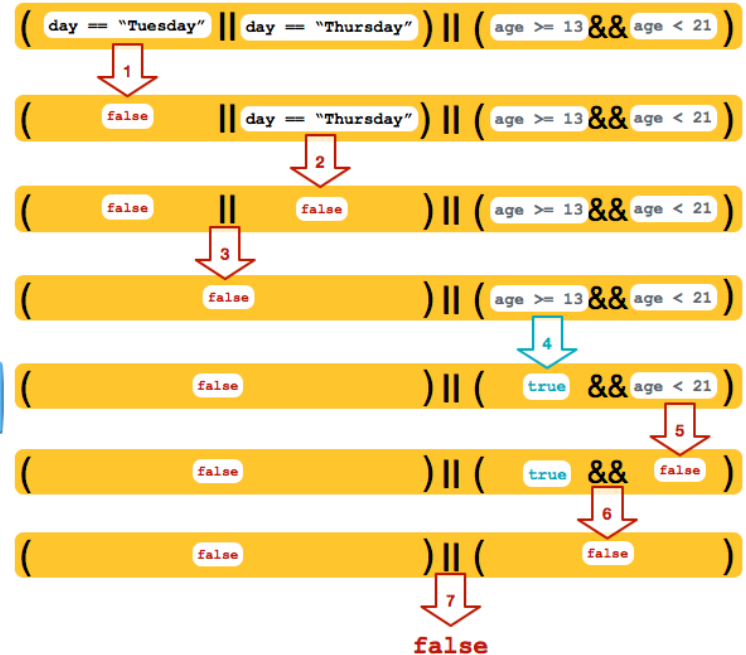
You must have at least one if statement, but you can add on else if and else statements as you expand the possibilities of your program. Additionally, to avoid confusion, it's a good idea to put parentheses around logic statements.

```
if( ( day == "Tuesday" || day == "Thursday" ) || ( age >= 13 ) && ( age < 21 ) ) {  
  console.log("You get the student discount");  
} else {  
  console.log("You have to pay full price");  
}
```

Scenario:

day = "Wednesday"

age = 21



TRUTH TABLES...

a	b	a && b
T	T	T
T	F	F
F	T	F
F	F	F

a	b	a b
T	T	T
T	F	T
F	T	T
F	F	F

LESSON 10: COLOR
SLUETH

LESSON 10: COLOR SLEUTH

The purpose of this lesson is to show how experienced programmers will approach problems.

Main Concepts:

- There are multiple ways to write a program.
- There's no set order to write code in. It's modular, and thus can be written in multiple orders.
- Solve small problems in code first in order to solve bigger ones later.

HOW EXPERIENCED PROGRAMMERS THINK

- Create basic functionality in the code.
- Once the basic parts are working, you can add more complex parts.
- The complex code is formed by combining basic functions.

```
var randomRed = randomNumber(10,245);  
var randomBlue = randomNumber(10,245);  
var randomGreen = randomNumber(10,245);
```

```
setProperty("button1", "background-color", color);  
setProperty("button2", "background-color", color);  
setProperty("button3", "background-color", color);  
setProperty("button4", "background-color", color);
```


The above code is two basic functions, however, the code below combines them, allowing for randomly selected colors, adding advanced functionality from two basic functions.

```
var color = "rgb(" + randomRed + ", " + randomBlue + ", " + randomGreen + ")";
```

LESSON 11: WHILE LOOPS

While Loops

```
while (conditional statement) {  
    //code  
}
```



The diagram illustrates the flow of a while loop. A horizontal line starts from the closing curly brace '}' and extends to the right. From the end of this line, a vertical line goes up, then a horizontal line goes left towards the opening curly brace '{', and finally a diagonal line goes down and left into the opening brace. This path is labeled 'Go back to the beginning'.

- A while loop is a if statement that runs repeatedly as long as the conditional statement is true.
- If the conditional statement is true, the code inside of the brackets is executed and once the code inside of the brackets is finished, the program returns back to the beginning to check the conditional statement again.
- If the conditional statement is false, the program will jump to the line of code right after the loop's closing bracket and does not run the code or return to the loop's beginning

VOCABULARY

VOCAB:

- **Boolean** - A single value of either TRUE or FALSE
- **Boolean Expression** - in programming, an expression that evaluates to True or False.
- **Conditionals** - Statements that only run under certain conditions.
- **If-Statement** - The common programming structure that implements "conditional statements".

VOCAB:

- **Selection** - A generic term for a type of programming statement (usually an if-statement) that uses a Boolean condition to determine, or select, whether or not to run a certain block of statements.
- **Iterate** - To repeat in order to achieve, or get closer to, a desired goal.
- **while loop** - a programming construct used to repeat a set of commands (loop) as long as (while) a boolean condition is true.