- ternary expression
- && (AND) operator, || (OR) operator
- switch - case - break - default

ternary expression

A ternary is a concise alternative to an if-else statement. // What takes an "if else" five lines to do, a ternary does in one.

1. Declare three number variables.

```
let x = 5;
let y = 8;
let z = 0;
```

2. If x < y, add them; else multiply them; save the answer to z:

```
if(x < y) {
    z = x * y;
} else {
    z = x + y;
}
console.log('z', z); // 40
```

Now to convert the "if else" to a ternary:

3. Get rid of the "if()", "else" and curly braces:

```
//   x < y
//     z = x * y;
//     z = x + y;
```

4. Put a question mark in front of the if part:

```
//   x < y
//     ? z = x * y;
//     z = x + y;
```

5. Put a colon in front of the else part:

```
//   x < y
//     ? z = x * y;
//     : z = x + y;
```

6. Lose the first semi-colon; this makes it one line of code:

```
//   x < y
//     ? z = x * y
//     : z = x + y;
```

7. Back everything up onto the same line, and log z:

```
x < y ? z = x * y : z = x + y;
console.log(z); // 40
```

8. Instead of "z =" twice, put "z =" at the beginning:

```
z = x < y ? x * y : x + y;
console.log(z); // 40
```

CHALLENGE:

8. Convert the following "if else" to a ternary:

```
let n = 5;

if(n == 7) {
    n = 0;
} else {
    n++;
}
console.log('n', n); // 6

// TERNARY:

console.log('n', n); // 6
```

9. Also convert this "if else" to a ternary:

```
let day = "nice";
let beach;

if(day == "nice") {
    beach = true;
} else {
    beach = false;
```

```
}
console.log('beach:', beach); // beach: true

// TERNARY:

console.log('n', n); // 6
```

&& (AND), || (OR) operators

Two or more conditions can be evaluated in an if statement:

- && (AND) operator requires both conditions to be true
- || (OR) operator requires either condition to be true

&& (AND) operator

Let's try an if statement with && (AND), where both conditions must be true.

10. Declare two variables, a string and a number:

```
let weather = "sunny";
let temperature = 78;
```

11. Using &&, write an "if statement" where:

- weather must be "sunny" AND
- temperature must be at least 70
- if BOTH conditions are true, go to the beach:

```
if(weather == "sunny" && temperature >= 70) {
    console.log("It's warm and sunny! Let's go to the beach!");
}
```

12. Add an "else part"; it will run if EITHER or BOTH conditions are false:

```
if(weather == "sunny" && temperature >= 70) {
    console.log("It's warm and sunny! Let's go to the beach!");
} else {
    console.log("We're not going to the beach..");
}
```

There are 3 "no beach" scenarios:

- It's not sunny, nor is it warm enough.

- It's sunny, but it's not warm enough.
- It's warm enough, but it's not sunny.

13. Inside the "else", add a nested "if - else if - else" to handle the 3 "no beach" scenarios:

```
if(weather == "sunny" && temperature >= 70) {
    console.log("It's warm and sunny! Let's go to the beach!");
} else {
    console.log("We're not going to the beach..");
    if(weather != "sunny" && temperature < 70) {
        console.log("It's not sunny, nor is it warm enough.");
    } else if(weather == "sunny") {
        console.log("It's sunny, but it's not warm enough.");
    } else {
        console.log("It's warm enough, but it's not sunny.");
    }
}
```

14. Changing the values of weather and temperature, keep running it until you get all four possible outcomes.

15. Declare a few variables:

```
let cash = 150;
let credit = 300;
let buyStuff;
```

16. Write an if statement where we will buy stuff only if we have at least 100 in BOTH cash AND credit. Both conditions are true, so the "if part" runs:

```
if(cash >= 100 && credit >= 100) {
    buyStuff = true;
} else {
    buyStuff = false;
}

console.log('buy stuff:', buyStuff); // buy stuff: true
```

17. Reduce cash to 50 and run it again. Since only one condition is now true, the "else part" runs:

```
cash = 50;
credit = 300;

if(cash >= 100 && credit >= 100) {
    buyStuff = true;
} else {
```

```
    buyStuff = false;
}

console.log('buy stuff:', buyStuff); // buy stuff: false
```

|| (OR) operator

Let's try an if statement with || (OR), where only one condition must be true.

18. Change the && to ||. Now, only one condition needs to be true, so the "if part" runs:

```
cash = 50;
credit = 300;

if(cash >= 100 || credit >= 100) {
    buyStuff = true;
} else {
    buyStuff = false;
}

console.log('buy stuff:', buyStuff); // buy stuff: true
```

19. Set credit to below 100, so that neither conditions is true. The else part runs:

```
cash = 50;
credit = 30;

if(cash >= 100 || credit >= 100) {
    buyStuff = true;
} else {
    buyStuff = false;
}

console.log('buy stuff:', buyStuff); // buy stuff: false
```

&& and || in one if statement

20. Declare a few variables:

```
let meal = "dinner";
let potato = "baked";
let orderSteak;
```

21. Order steak if BOTH of these conditions are met: the meal is dinner AND The potato is baked

```
if(meal == "dinner" && potato == "baked") {
    orderSteak = true;
} else {
    orderSteak = false;
}

console.log("Order steak:", orderSteak); // Order steak: true
```

22. Change potato to mashed and run it again. We no longer order the steak, because only one condtion has been met:

```
potato = "mashed";

if(meal == "dinner" && potato == "baked") {
    orderSteak = true;
} else {
    orderSteak = false;
}

console.log("Order steak:", orderSteak); // Order steak: false
```

To combine && and || in the same if statement, use parentheses to compound the logic.

23. Add an || part, so that we order the steak if the meal is dinner AND the potato is either baked OR mashed. The two potatos must be wrapped in parentheses, like tin foil:

```
if(meal == "dinner" && (potato=="baked" || potato=="mashed")) {
    orderSteak = true;
} else {
    orderSteak = false;
}

console.log("Order steak:", orderSteak); // Order steak: true
```

24. Change the potato to "French fries", making the OR condition false. Since both meal and potato must be true, we don't order the steak:

```
potato = "French fries";

if(meal == "dinner" && (potato=="baked" || potato=="mashed")) {
    orderSteak = true;
} else {
    orderSteak = false;
}

console.log("Order steak:", orderSteak); // Order steak: false
```

CHALLENGES:

A.
Write an "if else" such that we will watch a movie if we have at least 2 hours of free time AND the genre is comedy. Otherwise, we will NOT watch a movie. After you get it to work so that you watch the movie, change the variable(s) so that you don't watch the movie.

```
```js
let watchMovie;
let genre = "comedy";
let hoursFree = 2.5;

if(hoursFree >= 2 && genre == "comedy") {
    watchMovie = true;
} else {
    watchMovie = false;
}

console.log("Watch movie:", watchMovie); // Watch movie: true

genre = "drama";

if(hoursFree >= 2 && genre == "comedy") {
    watchMovie = true;
} else {
    watchMovie = false;
}

console.log("Watch movie:", watchMovie); // Watch movie: false
```
```

B.
Write an "if else" such that we will wear our baseball cap if the temperature is less than 60 degrees OR if it is sunny OR if it is rainy. Only ONE of these three conditions need be true for us to wear the cap. If NONE of these three conditions are true, we will NOT wear the cap. Run it so that we DO wear the cap, and then change it so that we do NOT wear the cap.

```
```js
let wearCap;
let degrees = 50;
weather = "sunny";

if(degrees < 60 || weather == "sunny" || weather == "rainy") {
    wearCap = true;
} else {
    wearCap = false;
```
```

```
}

console.log("Wear cap:", wearCap); // Wear cap: true

degrees = 70;
weather = "cloudy";

if(degrees < 60 || weather == "sunny" || weather == "rainy") {
    wearCap = true;
} else {
    wearCap = false;
}

console.log("Wear cap:", wearCap); // Wear cap: false
```

C.
Write an "if else" such that we will drive to the mall if we have a car AND if the mall is less than 10 miles away OR traffic is light. In other words:

- If we have a car and the mall is 5 miles away, we go, even if the traffic is heavy.
- If we have a car and the mall is 15 miles away, we go only if the traffic is not heavy.
- If we have a car but the mall is 15 miles away the traffic is heavy, we don't go.
- If we don't have a car, we don't go regardless of distance to mall or traffic conditions.
- Run it a couple of times with different variable values, so that you go to the mall and don't go to the mall.

```
let hasCar = true;
let distance = 5;
let heavyTraffic = true;
let goToMall;

if(hasCar == true && (distance < 10 || heavyTraffic == false)) {
    goToMall = true;
} else {
    goToMall = false;
}

console.log("Go to mall:", goToMall); // Go to mall: true
```

A shorter version of above: no == comparison for booleans:

```
```js
if(hasCar && (distance < 10 || !heavyTraffic)) {
```
```

```
    goToMall = true;
} else {
    goToMall = false;
}

console.log("Go to mall:", goToMall); // Go to mall:: true
```

Making it so we don't go to the mall:

```
```js
distance = 15;
if(hasCar && (distance < 10 || !heavyTraffic)) {
    goToMall = true;
} else {
    goToMall = false;
}

console.log("Go to mall:", goToMall); // Go to mall:: false
```
```

D.
Expanding upon C, above:
If the mall is within walking distance (less than 2 miles), we will go there, regardless of whether or not you have a car.

```
```js
distance = 1.5;

if(hasCar && (distance < 10 || !heavyTraffic)) {
    goToMall = true;
} else {
    if(distance < 2) {
        goToMall = true;
    } else {
        goToMall = false;
    }
}

console.log("Go to mall:", goToMall); // Go to mall: true
```
```

E.
Expanding upon D, above:
Once we get to the mall, if we have at least $100, we will buy shoes. If we can't buy shoes, but we do have

at least $50, we will buy a hoodie. If we can't buy a hoodie, assume that we have enough money to buy a T-shirt, and just buy that.

F.
Ternary Review Convert the following from "if else" to a ternary.

```
```js
let ca$h = 50;
let cred = 300;
let buyIt;

if(ca$h > 99 || cred > 99) {
    buyIt = true;
} else {
    buyIt = false;
}

// ternary version:
ca$h > 99 || cred > 99 ? buyIt = true : buyIt = false;
// Or even more concise:
buyIt = ca$h > 99 || cred > 99 ? true : false;

console.log('buy stuff:', buyStuff); // buy stuff: true
```
```

G.
Ternary Review
Convert the following from an "if else" to a ternary.

```
```js
let score = 98;
let grade = "";

if(score >= 65) {
    grade = "Pass";
} else {
    grade = "Fail";
}

console.log("Grade: " + grade);

// TERNARY:
score >= 65 ? grade = "Pass" : grade = "Fail";

console.log('Ternary Grade: ' + grade);
```
```

switch - case - break - default:

an alternative to "if-else if-else"

Given: two variables:

```
```js
let moneySymbol = "GBP";
let currency = "";
```
```

Given: currency is set based on moneySymbol:

```
```js
if(moneySymbol == "USD") {
    currency = "US Dollar";
} else if(moneySymbol == "GBP") {
    currency = "British Pound";
} else if(moneySymbol == "JPY") {
    currency = "Japanese Yen";
} else {
    currency = "Not Dollar, not Pound, not Yen";
}

console.log(`${moneySymbol}; ${currency}`);
```
```

3. Convert the "if-else if-else" to "switch-case-default":

- In a switch-case-break-default:
- the switch is compared to the case:
- switch("GBP") is compared to case: "USD";
- if they don't match, the next case is considered:
- switch("GBP") is compared to case: "GBP";
- if they match, the code up until the break runs.
- if no case matches the switch, the default runs.
- the default is like the else part of an "if else"

```
switch (moneySymbol) {

    case "USD": // condition test for (moneySymbol)
```

```
    // condition test is true, set value of currency variable
    currency = "US Dollar";
    break; // ends this part like a closing curly brace

    case "GBP":
    currency = "British Pound";
    break;

    case "JPY":
    currency = "Japanese Yen";
    break;

    default: // no case is true, so do this (like an else part)
    currency = "Not Dollar, not Pound, not Yen";
    break;
}

console.log(`${moneySymbol}; ${currency}`);
```

4. Change the moneySymbol to something that matches no case:

```
moneySymbol = "RMB";

switch (moneySymbol) {

    case "USD": // condition test for (moneySymbol)
    // condition test is true, set value of currency variable
    currency = "US Dollar";
    break; // ends this part like a closing curly brace

    case "GBP":
    currency = "British Pound";
    break;

    case "JPY":
    currency = "Japanese Yen";
    break;

    default: // no case is true, so do this (like an else part)
    currency = "Not Dollar, not Pound, not Yen";
    break;
}

console.log(`${moneySymbol}; ${currency}`);
```