TypeScript

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Objectives

- Review Resume/Profile Lab
- Set up Cloud9 for TypeScript Development
- What is TypeScript
- Variables - let & const
- Data Types
- Arithmetic Operators
- Comparison Operators
- Logical Operators
- TypeOf

Set Up Cloud9 for TypeScript Development

Step 1 - Create a new BLANK application in cloud9

Step 2 - npm init : we will hit enter all the way until we have to type yes

Step 3 - touch mycode.ts

Step 4 - Inside the package.json file we will change main to the name of or .ts file

Step 5 - Type some typescript code > save > and do tsc mycode.ts to run it

Step 6 - Create a tsconfig file by doing tsc --init in terminal

Step 7 - watch mode tsc mycode.ts --w

What is TypeScript?

TypeScript is a superset of JavaScript which primarily provides optional static typing Classes, and Interfaces. One of the big benefits is to enable IDE's to provide a richer environment for spotting common errors as you type the code. TypeScript compiles to JavaScript.

What is a compiler?
A compiler is a software program that transforms source code written by a developer in a high level programming language into low level object code(binary code) in machine language, which can be understood by the processor

Variables: let & Const

What is a variable?

A variable is a value that can change, depending on conditions or on information passed to the program. It's like a variable like a box to hold something that can change!

There are two ways of declaring variables in TypeScript.

let - used to hold variables that can change.

const - used to hold variables that do not change

Example of using let to declare a variable

```
let myName: string = "Mikaila";

console.log(myName);
```

How we print something to the console?

Example of using const to declare a variable

```
const myAge: number = 19;

console.log(myAge);
```

If we try to assign another age to this variable the compiler will give us an error

We have several data types in TypeScript such as ...

String: used to define text or letters

Number: used to defined variables that must be numbers or decimals

Boolean: used to hold data that will be True or False

Any: used to hold data types that can change to any type such as string or number

Array: used to hold a list of data with indexes starting at 0

Tuples: are like arrays but with mixed types and the order is important

Enums: used to make numbers more expressive

Arithmetic Operators

Addition Plus sign (+)
Subtraction Minus sign (-)
Multiplication Multiplication sign (*)
Division Division sign (/)
Modulus Remainder(%)
PostFix Increment and Decrement (x++) & x(--)
Prefix Increment and Decrement (++x) & (--x)

Comparison Operators - Assuming X = 5

x > 10 = false

x < 10 = true

x >= 5 = true

x <= 100 = true

x == "5" = true // Type coercion

x === "5" = false // No type coercion

x != b = true

x !== "5" = true

Logical Operators

&& AND both sides need to be true

|| OR One side needs to be true

! NOT if something was true it makes it false (vice versa)

Using Operators for calculations

P. E. D. M. A. S rules applies -

The grouping operator ( ) controls the precedence of evaluation of expressions

```
let x : number = 500;
let y : number = 400;
let z : number = 10;
let a : number = 2;
let Answer =  x - y + z  * a ;   // How to fix  - Add brackets before multiplication?
Console.log(Answer);
```

Ternary Condition Operator

It takes three operands such as condition ? val1 : val2

```
let age: number = 20;
let status : number  = ( age >= 21)  ?  'can drink'  :  'cannot drink';

console.log(status);
```

Conditional statements { if statements }

We have two main conditional statements in TypeScript.
The if else statement and a switch statement

IF STATEMENT

```
if (true) {
console.log(true);
} else{
console.log(false);
}
```

Using the OR || Comparison Operator

```
let n: string = 'netflix';
let  h: string = 'hulu';
let userInput: string = n;


if( (userInput == n) || (userInput == h) ){
        console.log('I will be streaming movies on netflix OR hulu this weekend' );
}else{
        console.log('I will be studying this weekend');
}
```

Using the AND && Comparison Operator

```
let n: string = 'netflix';
let  h: string = 'hulu';
let userInput1: string = 'netflix';
let userInput2: string = h;

if((userInput1 == n) && (userInput2 == h)){
        console.log(' I will be streaming movies on netflix and hulu this weekend ');
}else{
        console.log('I will be studying this weekend');

}
```

Switch statement

```
switch(value){
        case 0:
        console.log(print something.....);
        break;

        case 1:
        console.log(print something else.....);
        break;

        default:
        console.log(print something else.....);
        break;
}
```

TypeOf

Since static typing is optional in TypeScript you may come across data and need to know the type of data it is. That's when we use TypeOf as a mechanism to check

```
let myName = "Mikaila";

console.log(typeof(myName));
```

will print - String

Practice with the other data types such as boolean, array, number etc...