Typescript

Drawback of JavaScript

* It is not a typesafe language, a variable can accept any kind of value, it might lead to unexpected result
* It is directly executed, which would not show error before execution, it shows the error only at the time execution

Typescript

* It is a typed JavaScript means it adds types to variables & functions
* It is a super set of JavaScript because it supports all the features of JavaScript and some extra features to improve the development experience
* It is more type safer than JavaScript
* It is Compiled first and then executed, the typescripts are converted to JavaScripts when you compile, you can execute the JavaScripts generated from typescripts
* You can work on typescripts without working in Javascript
* It follows the same syntax of JavaScript

In JavaScript

function add(x, y) { }

You can call add by add(20, 30); add(20, “hello”), add(true, false) and so on, this would lead to unexpected output and also we can’t stop programmers passing specific type of value

In TypeScript

function add(x: number, y: number) { } // x & y are type of number, now the add() accepts only numbers

add(20, 30); // no error

add(“hello”, 30); // compilation error

In JavaScript a function can return any type of value

function add(x, y) { return x + y; }

Here return x + y can’t always be number, it can be string also

In TypeScript you can mention what function must return

function add(x : number, y : number): number {   
 return (x + y)   
}

Here the add() function returns number, if you try to return a string or a boolean, typescript throws compilation error

Typescript has below types

* number
* string
* void
* boolean
* any
* []

Along with this it supports complex types and union types

Complex types: You can return a class type

Union types: Multiple types

function getUser() : User {  
  
}

The function getUser() returns User type

function getResult(): number | string {   
  
}

The function getResult() returns either number or string, this is union type

function getData(): any {  
  
}

The function getData() returns any type, means it can be anything

Does browser understand Typescript?

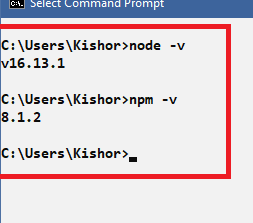
* NO

You must use Typescript to avoid development errors and convert it to Javascript through typescript compiler and run the javascript on the browser

Typescript compiler

It is a software to compile typescript files, which can be downloaded using npm command that comes from node.js

npm: Node package Manager, which is a command line tool to download the third party javascript libraries from the internet, these javascript libraries will be stored in node\_modules folder.



How to install typescript

>> npm install typescript

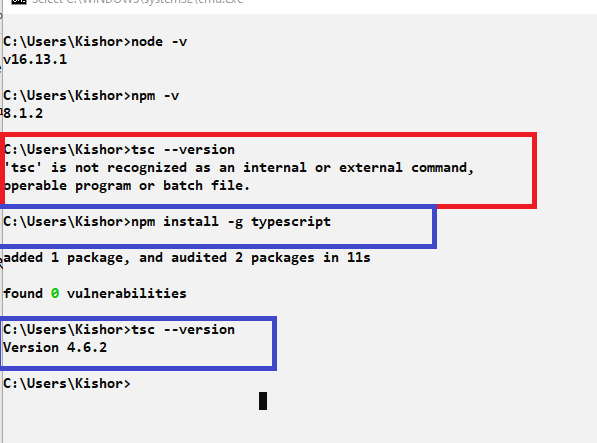
(or)

>> npm install -g typescript

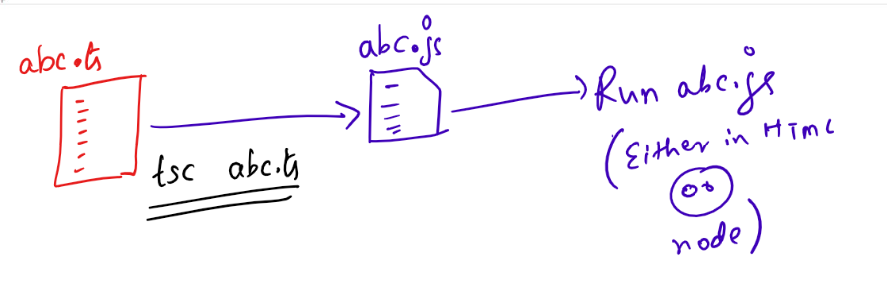
-g means, global installation so the typescript compiler will be available in any location of your machine, without -g, typescript compiler will be available only at the location where you entered npm install

Verify typescript installation

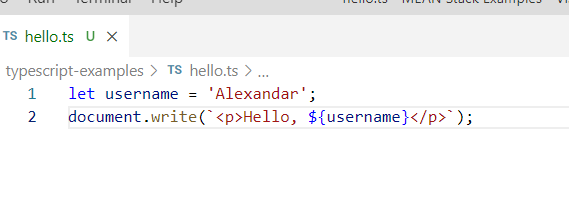
>> tsc --version



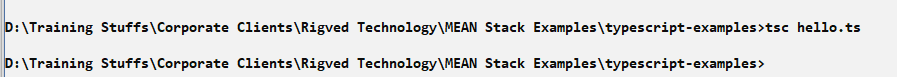
How typescript must be used



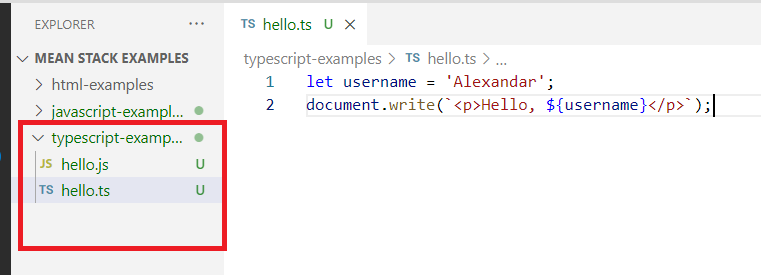
hello.ts



Compilation of hello.ts

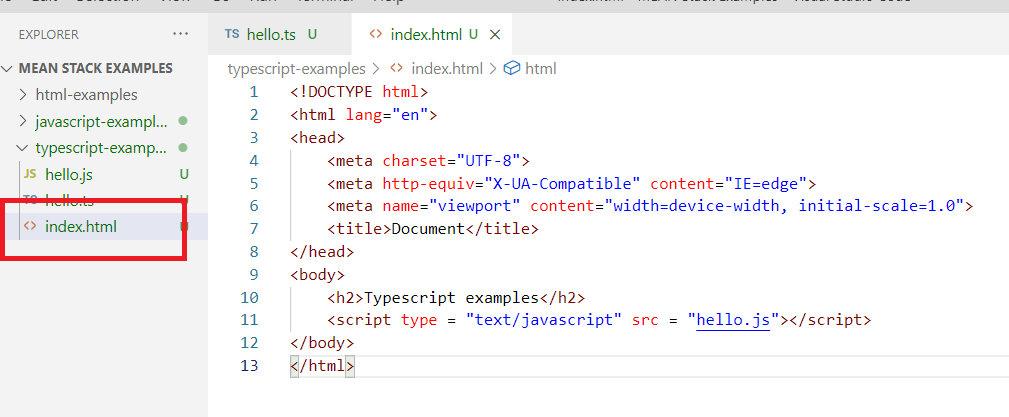


You can notice hello.js



Now you can include hello.js file in the HTML to see the output

index.html

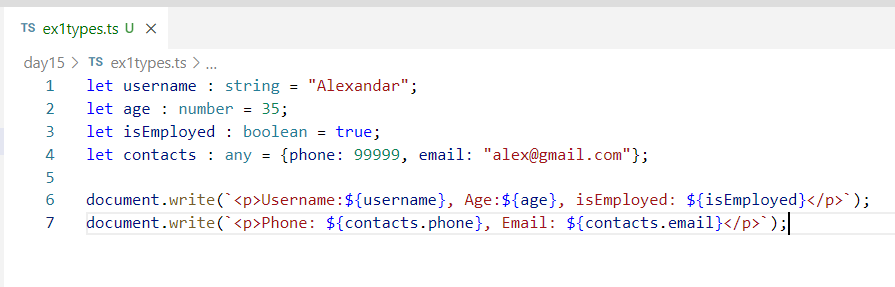


Output:

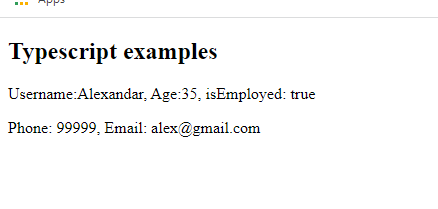


Adding some types to the script

ex1types.ts



Add the converted javascript to html and output would be



Tuples:

It allows you to express array with fixed set of values

let x : [string, number, string];

here x must have values that matches to the tuples

i.e., x = [“hello”, 30, “world”]; // this is ok

x = [“hello”, 20, “world”, “hi”]; // this leads to an error

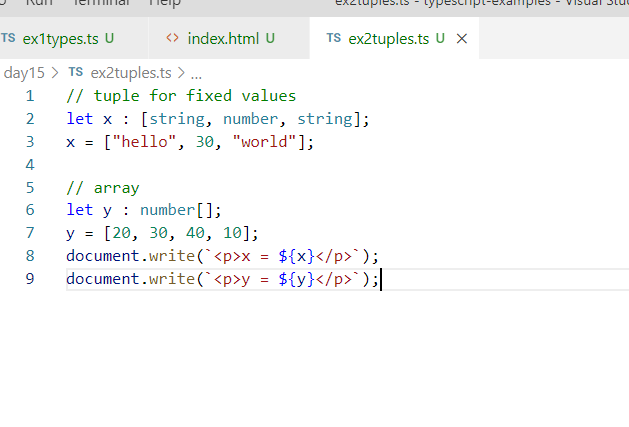
Functions with return types

This allows to mention the type of value a function would return

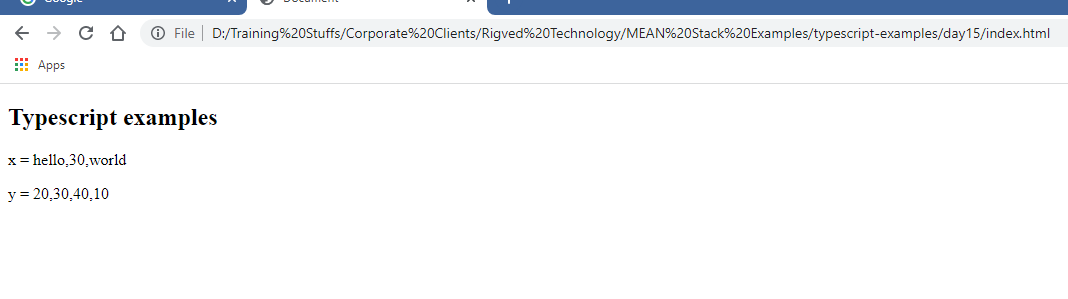
function fun\_name(): return\_type { }

return\_type can be number, string, any, boolean, void etc.

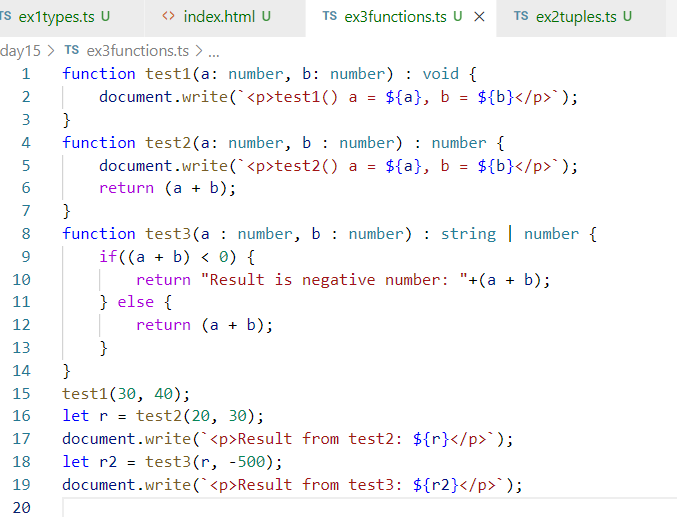
ex2tuples.ts

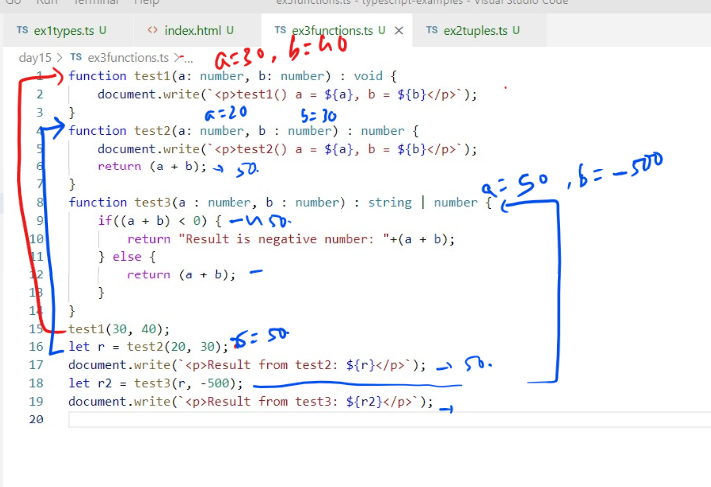


Output:

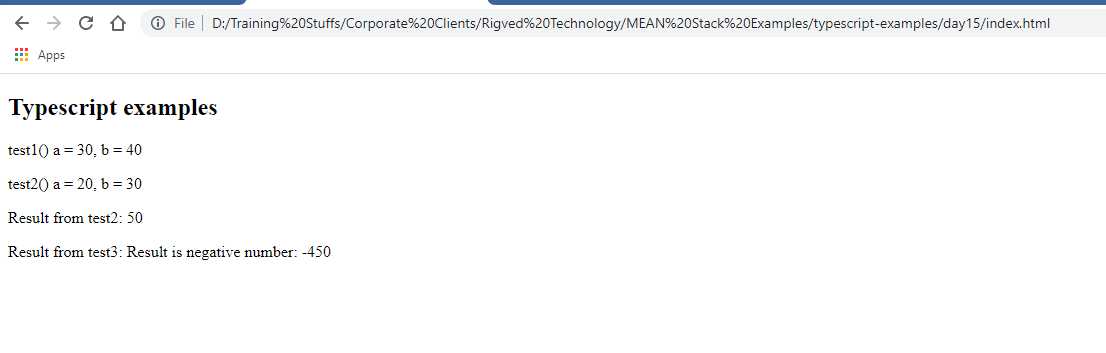


ex3functions.ts



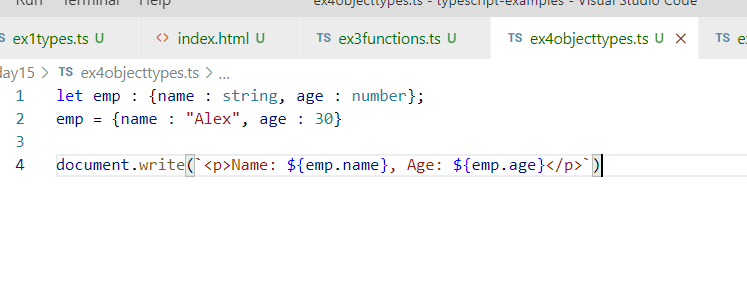


Output:



Specify types to the object

ex4types.ts



Output:

