Experiment No.: 02

Title: Demonstrate Functions, Arrays and Tuples in Typescript.

Objectives:

1. To study Functions, Arrays & tuples in Typescript.

Theory:

Introduction to Typescript-

Typescript is JavaScript for application-scale development. TypeScript is a strongly typed, object oriented, compiled language. TypeScript is both a language and a set of tools. TypeScript is a typed superset of JavaScript compiled to JavaScript. In other words, TypeScript is JavaScript plus some additional features.

Components of Typescript-

TypeScript has the following three components −

1) **Language –** It comprises of the syntax, keywords, and type annotations.

2) **TypeScript Compiler –**

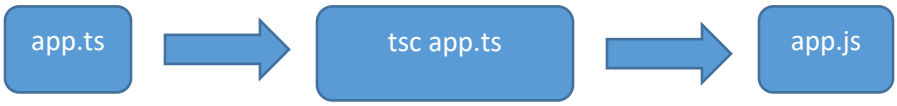
The TypeScript compiler (tsc) converts the instructions written in TypeScript to its JavaScript equivalent.

3) **TypeScript Language Service –**

The language service supports the common set of a typical editor operations like statement completions, signature help, code formatting and outlining, colorization, etc.

Typescript Compiler-

The TypeScript compiler is itself a .ts file compiled down to JavaScript (.js) file. The TSC is a source-to-source compiler. TSC produces an equivalent JavaScript source code from the Typescript file given as an input to it.



Installing Typescript-

1) Install Node.js
2) Install Typescript using the npm package manager

npm install –g typescript

Compile and Execute a TypeScript Program-

1) Save the file with .ts extension. We shall save the file as demo.ts. The code editor marks errors in the code, if any, while you save it.
2) To compile the file use the following command-

   tsc demo.ts
3) The file is compiled to demo.js. To run the program written, type the following command-

   node demo.js

Functions-

Functions are the fundamental building block of any application in JavaScript. TypeScript functions can be created either as a named function or as an anonymous function.

Optional and Default Parameters-

In TypeScript, every parameter is assumed to be required by the function. When the function is called, the compiler will check that the user has provided a value for each parameter. The number of arguments given to a function has to match the number of parameters the function expects.

Rest Parameters-

Rest parameters are similar to variable arguments in Java. Rest parameters don't restrict the number of values that you can pass to a function. However, the values passed must all be of the same type.

Array-

An array is a special type of data type which can store multiple values of different data types sequentially.

To declare an initialize an array in Typescript use the following syntax –

```
var array_name [:datatype];          //declaration
array_name = [val1, val2, ……, valn]  //initialization
```

An array declaration without the data type is deemed to be of the type any.

The array name followed by the subscript is used to refer an array element. Its syntax is as follows –

array_name [subscript] = value

Tuples-

Tuple is a data type which includes two set of values of different data types. It represents a heterogeneous collection of values. Its syntax is-

```
var tuple_name = [value1,value2,value3,…value n]
```

Tuple values are individually called items. Tuples are index based. This means that items in a tuple can be accessed using their corresponding numeric index.

```
tuple_name [index]
```

Tuple Operations-

Tuples in TypeScript supports various operations like pushing a new item, removing an item from the tuple, etc.

- The push() appends an item to the tuple
- The pop() removes and returns the last value in the tuple

Key Concept: Typescript, Function, Array, Tuple