Chapter 3 – Complex Types

1. Introduction
   1. TypeScript makes it very easy to keep track of element types in arrays
   2. Manual type-checking is needlessly difficult and adds complications

|  |
| --- |
| let customersArray = ['Custy Stomer', 'C. Oostomar', 'C.U.S. Tomer', 3432434, 'Custo Mer', 'Custopher Ustomer', 3432435, 'Kasti Yastimeur'];  //Write Your Code here:  function checkCustomersArray() {  for (el of customersArray) {  if (typeof el != 'string') {  console.log(`Type error: ${el} should be a string!`);  }  }  }  function stringPush(val) {  if (typeof val != 'string') {  return;  }  customersArray.push(val);  } |

1. Array Type Annotations
   1. Type annotation for array types is fairly straightforward: [] after the element type
   2. Throw errors when elements of the wrong type are added

|  |
| --- |
| let names: string[] = ['Danny', 'Samantha'];  let names: string[] = ['Damien'];  names.push(666) // Type Error! |

* 1. Alternate - use the Array<T> syntax, where T stands for the type.

|  |
| --- |
| let names: Array<string> = ['Danny', 'Samantha']; |

Exercise

|  |
| --- |
| // Arrays:  let bestNumbers: number[] = [7,77,4];  let bestLunches: string[] = ['chicken soup', 'non-chicken soup'];  let bestBreakfasts: string[] = ['fasting', 'oatmeal', 'tamago kake gohan', 'any kind of soup'];  let bestBooleans: boolean[] = [true, false]; |

1. Multi-dimensional Arrays
2. Done using [][]

|  |
| --- |
| let arr: string[][] = [['str1', 'str2'], ['more', 'strings']]; |

Exercise

|  |
| --- |
| // Arrays:  let bestNumbers: number[] = [7,77,4];  let bestLunches: string[] = ['chicken soup', 'non-chicken soup'];  let bestBreakfasts: string[]= ['fasting', 'oatmeal', 'tamago kake gohan', 'any kind of soup'];  let bestBooleans: boolean[] = [true, false];  // Multidimensional Arrays:  let bestMealPlan: string[][] = [bestLunches, bestBreakfasts, ['baked potato', 'mashed potato']];  let bestBooleansTwice: boolean[][] = [bestBooleans, bestBooleans];  let numbersMulti: number[][][] = [ [[1],[2,3]], [[7],bestNumbers] ]; |

1. Tuples
   1. Tuple acts like arrays
      1. Has .length properties
      2. Can access element using [index]
      3. But can’t assign an array to a tuple variable

|  |
| --- |
| let tup: [string, string] = ['hi', 'bye'];  let arr: string[] = ['there','there'];  tup = ['there', 'there']; // No Errors.  tup = arr; // Type Error! An array cannot be assigned to a tuple. |

* 1. Tuple types specify both the lengths and the orders of compatible tuples, and will cause an error if either of these conditions are not met

|  |
| --- |
| let numbersTuple: [number, number, number] = [1,2,3,4]; // Type Error! numbersTuple should only have three elements.  let mixedTuple: [number, string, boolean] = ['hi', 3, true] // Type Error! The first elements should be a number, the second a string, and the third a boolean. |

Exericse

|  |
| --- |
| let favoriteCoordinates:[  number, number, string,  number, number, string, number];      favoriteCoordinates = [17, 45, 'N', 142, 30, 'E', -100];  favoriteCoordinates[6] = -6.825; |

1. Array Type Interface
   1. TypeScript can infer variable types from initial values and return statements