

# CS 315

## Homework Assignment 1

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**Assigned: March 24, 2025**

**Due: April 7, 2025, 23:55**

### Arrays in Dart, Go, JavaScript, Kotlin, PHP, Python, and Rust

An *array* is an aggregate data structure that is designed to store a group of objects. Most programming languages provide built-in support for arrays. In this homework assignment, you will compare the array data structures provided in seven different programming languages: Dart, Go (Golang), JavaScript, Kotlin, PHP, Python, and Rust. You will investigate how the following design issues are addressed in these programming languages:

1. What types are legal for subscripts?
2. Are subscripting expressions in element references range checked?
3. Are ragged multidimensional arrays allowed?
4. Can array objects be initialized?
5. Are any kind of slices supported?
6. Which operators are provided?

For each design issue and for each language, explain the answer clearly by giving examples using code segments in these languages. You can illustrate the answers to these questions, in different parts of a single program. The example program must be complete.

You can use online compilers/interpreters for this homework.

For each language, prepare a single source code file that exemplifies and tests each operation, in the order given above. Your example programs must be different from the example codes that may be available on the Internet. Be careful to avoid plagiarism!

Organize all of your experiments and their results and put them into a report. The report should include Parts A, B, and C, as explained below:

#### Part A - Operations in each language (45 points)

For each language and each operation, give the sample code segments and the results of their execution. You should explain what your example does, and the output, if generated.

#### Part B - Evaluation (10 points)

Your evaluation of these languages in terms of readability and writability of list operations. Discuss, in your opinion, which language is the best for list operations.

#### Part C - Learning strategy (10 points)

A learning strategy is an individual's approach to completing a task. In this section, discuss, in detail, the material and tools you used, and the experiments you performed. Also talk about personal communication, if you had. Give the URLs of the online compiler/interpreters you used to run your programs

#### Part D- Sample Codes (35 points)

The sample code files must compile and run without any errors.

**Submission:**

A single **zip** or **rar** file should be submitted containing the following files with given names:

1. A single file for the **Report**, containing parts A, B, and C: `ID_lastname_name_report.pdf` (65 Points)
2. A folder called, **Codes**, for Part D. The contents of the folder will be as follows:
  1. A single file for **Dart** code: `ID_lastname_name.dart` (5 points)
  2. A single file for **Go** code: `ID_lastname_name.go` (5 points)
  3. A single file for **JavaScript** code: `ID_lastname_name.html` (5 points)
  4. A single file for **Kotlin** code: `ID_lastname_name.kt` (5 points)
  5. A single file for **PHP** code: `ID_lastname_name.php` (5 points)
  6. A single file for **Python** code: `ID_lastname_name.py` (5 points)
  7. A single file for **Rust** code: `ID_lastname_name.rs` (5 points)

Please upload the **zip** or **rar** file you created to Moodle before the due date.

**Important Notes:**

- Late submissions will be accepted, with 10 points (out of 100) deduction for each extra day.
- You may use the tutorials available on the Internet as a reference but do not derive your example from the contents of the tutorials. If you do so, your programs may be similar to others in the class, which causes a disciplinary investigation.
- Collaboration on the homework is not allowed.