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| Untitled-1.jpg | **Coding Dojo Academy**  **Algorithm Series, I**  Mon/Wed/Fri @ 8:00 am PDT (1hr) |

**Data Structures Introduced**

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| Week 1 - Arrays  Week 2 - Strings & Objects  Week 3 - Singly Linked Lists  Week 4 - Doubly Linked Lists  Additional Courses | |

**Coding Dojo Academy Rules**

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| *Be humble, and respectful*  *Be present, on time, attentive and responsive* | *Strength through struggle*  *Be supportive to your peers, help each other* |

**Instructors**

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| *Speros Misirlakis*  *Head of Coding Dojo Curriculum*  *and Coding Dojo Academy*  ***Slack:*** *@Speros - Coding Dojo*  ***Email:***[*speros@codingdojo.com*](mailto:speros@codingdojo.com)  [*LinkedIn*](https://www.linkedin.com/in/speros-misirlakis-38474328/) | [*Github Link*](https://github.com/keephopealive) | *Jason Franz*  *Online Instructor*  ***Slack****: @Jason - Coding Dojo*  *Email:* [*jfranz@codingdojo.com*](mailto:jfranz@codingdojo.com)  [*Github Link*](https://github.com/jfrazx) |

* Prerequisite[**Algorithm App**](http://algorithm.codingdojo.com/) *is Coding Dojo’s algorithm platform designed to help new developers learn the very fundamentals of algorithms using JavaScript, this is a prerequisite to Algorithm Series, I.*
* [Click here to **download Zoom**, required software for Live Lectures](https://support.zoom.us/hc/en-us/articles/201362233-Where-Do-I-Download-The-Latest-Version-)
* [Click here to **access our Google Drive folder for homework submission**](https://drive.google.com/open?id=1MonNaj_6e1Ij22aQ7Usa6jBNmaLm20r8) - We will be using this Google Drive to upload homework, please visit the above link and create a folder with your full first name and initial last name *e.g. Tom Jones =* ***Tom J****, Diana Mills =* ***Diana M***

*Homework is not directly graded, though it’s still required for certification, homework is reviewed by the instructor and overall notes are kept to be brought up in the following lecture, to benefit all students from the reviews.*

*Please be respectful and keep the folder pattern as shown above. Do not use usernames, please use your real first name and real last name initial. Use your own folder to upload the homework files into. Any malicious use of the google drive will get you ejected from the Academy programs and blacklisted from all Coding Dojo services, indefinitely.*

**Tools & Resources**

* [**Webinar** *(click here to join our live lecture)*](https://codingdojo.zoom.us/j/319516868)*: Use this link to join live lectures at the scheduled date/times.*
* *(new)* [**Academy Forums**](http://academy.codingdojo.com)***:*** *Academy forums are used for related discussions and Q&A.*
* [**Algorithm Book**](http://algorithms.dojo.news/static/Algorithms/index.html): HTML-version of the book. Do CTRL+F to find the algorithm challenges by name.
* [Click here to **launch JSBin**](https://jsbin.com/?js,console) - JSBin is a JavaScript Playground tool which helps us experiment with javascript code on the browser.
* [**Feedback Survey**](https://docs.google.com/forms/d/1DYJlVXJN35BYzYyingFngc-H1LIyigVJU8cvIj5V_GQ/) - Ongoing feedback survey form, please share with us what you like, don't like and want to see change, or simply just drop us a message. This survey will remain open, feel free to reuse it as you see fit.

**Schedule**

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| Week 1 - Arrays | | |
| Monday [[Recording]](https://vimeo.com/273347778/67aed6683d) **Agenda**  (20 min) Welcome  - Introduction of Instructors  - Course Overview  - Course Prerequisites  - JSBin  - VSCode  - Chrome JS Debugger  [- Arrays reading material](#kix.fwimhfd7oixx)  **Learning Objectives**  - Array data structure  - Using a T-Diagram  - How to insert/remove in/from an array by shifting values. | Wednesday [[Recording]](https://vimeo.com/273728361/7f9ca054ed)  **Agenda**  (20min) Open Q&A / Recap on Monday  - Introduction of new Array algorithms  **Learning Objectives**  - Swap values in an array  - Rotate values with an array  - Removing/Adding values in an array without using a second array. | Friday  **Agenda**  (20min) Open Q&A / Recap on Monday and Wednesday algorithms, ensure the full understanding of manipulating an array via shifting values, and swapping values within an array.  **Bonus Assignments**  **Learning Objectives**  - Passing by reference or by value. |
| [Basic](#kix.nas22qekepo0) *Required Homework* - Array: PushFront- Array: PopFront- Array: InsertAt- Array: RemoveAt - Array: Swap Pairs  - Array: Remove Duplicates  - Array: Min to Front  - Array: Reverse | [Intermediate](#x72pcc9jniu0)  - Rotate  - Filter Range  - Concat  - Skyline Heights  - Remove Negatives  - Remove Negatives (stable) | Advanced  Second-to-Last  Nth-to-Last  Second-Largest  Nth-Largest  Credit Card Validation |
| Week 2 - Strings & Objects | | |
| **Monday**  **Agenda**  (10min) Open Q&A, recap on Friday’s lecture and Arrays.  (10min) Introduce Strings  Reading Material - Strings  **Basic**  *Required Homework*  - Remove Blanks  - Get Digits  - Acronyms  - Count Non-Spaces  - Remove Shorter Strings  - Reverse  - Remove Even-Length Strings  - Integer to Roman Numerals  - Roman Numerals to Integer  **Learning Objectives**  - String data structure  - Strings are immutable  - Concatenation  - Associate Array data structure (Objects) | **Wednesday**  **Agenda**  (20-40 min) Open Q&A, recap on Monday’s lecture and strings.  (20 min) Clarifying questions / edge cases on new algorithms.  **Intermediate**  - Parens Valid  - Braces Valid  - Is Palindrome  - Longest Palindrome | **Friday**  **Agenda**  Open Q&A, recap on week’s lectures of string data structures. |
| Week 3 - Singly Linked Lists | | |
| **Monday**  **Agenda**  (10 min) Open Q&A, recap on Friday’s lecture on Strings  (20 min) Introduce Linked Lists  (10 min) Assignment Questions  **Basic**  *Required Homework*  - addFront  - addBack  - removeFront  - contains  - front  - length  - average  - min  - max  - display  **Learning Objectives**  - What is a Linked List (Data Structure)?  - What is a Node (object)?  - What is a List (object)?  - Object Constructor (Class)  - Passing by reference vs copy.  - Variables do not store the object, they store the memory location of that object. | **Wednesday**  **Agenda**  (20min) Open Q&A, recap on Monday’s lecture on Linked Lists.  **Intermediate**  - moveMinToFront  - moveMaxToBack  - removeNode  - prependNode  - appendNode  - splitOnVal  - removeNegatives  - concat  - partition  - deleteGivenNode | **Friday**  **Agenda**  (20-40min) Open Q&A and recap on Singly Linked Lists. |
| Week 4 - Doubly Linked Lists | | |
| **Monday**  **Agenda**  (15 min) Introduction to Doubly Linked Lists  (15 min) Demo/Lecture on Doubly Linked List Algorithm  Reading Material for Doubly Linked Lists  **Basic**  Required Homework  DList: Append Value  DList: Prepend Value  DList: Delete Middle Node  DList: Kth-to-Last Value  DList: Is Valid  DList: Palindrome | **Wednesday**  **Agenda**  (20 min) Open Q&A for Doubly Linked Lists  **Intermediate**  DList: Reverse  DList: Loop Start  DList: Partition | **Friday**  **Agenda**  (20 min) Open Q&A for Doubly Linked Lists  **Advanced**  DList: Break Loop  DList: Repair |
| **Exam**  *Available as of Friday, after class, duration of 5 hours.* | | |
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**Previously recorded lectures available for reference:**

Algorithms I - May (Speros & Jason)

[W1D1 Recorded Lecture](https://vimeo.com/267288919/507e3c8450)

[W1D2 Recorded Lecture](https://vimeo.com/267679975/1b14a4915e)

[W1D3 Recorded Lecture](https://vimeo.com/268062062/4a97d874a3)

[W2D1 Recorded Lecture](https://vimeo.com/268483705/8779e7a43e)

[W2D2 Recorded Lecture](https://vimeo.com/268995199/b3b551ec76)

[W2D3 Recorded Lecture](https://vimeo.com/269277643/15a489c6bc)

[W3D1 Recorded Lecture](https://vimeo.com/269700253/61844854c2)

[W3D2 Recorded Lecture](https://vimeo.com/270233757/f293d969e7)

[W3D3 Recorded Lecture](https://vimeo.com/270709884/3db4a33d15)

[W4D1 Recorded Lecture](https://vimeo.com/271177403/aabb970681)

[W4D2 Recorded Lecture](https://vimeo.com/271767880/d39e2220f5)

[W4D3 Recorded Lecture](https://vimeo.com/271919077/9a5bcc64ed)