

PROJECT 2: ARRAY AND LINKED LISTS

Two different data structures for storing variables in a list, in an array or using pointers to form a linked set of variables.

- Array list, storing variables in an array
- Linked list, using node pointers to link a variable to other variables
- Circular linked list, a linked list where the last variable points to the first

Topics from INI910:

- Classes and methods, for setting up lists and performing operations on them
- Arrays and pointers, the two approaches to lists used
- Dynamic allocation, for assigning values of unknown size
- Linked lists, using pointers

PROJECT 2: SOLVING THE TASKS

— We used pair programming, mostly taking turns per sub-task given and working on them in the order given

Array List:

— We made a test function outside of the tasks given, because it seemed like a good exercise and check that everything worked as it should

Linked List:

— We made a doubly linked list because this seemed like a more interesting task

Circular List:

— For the Josephus problem we made a circular linked list class with fewer methods than the linked list, and rather did some of the functions inside of the Josephus method

— We made test functions here too because it seemed like a good exercise

PROJECT 2: CHALLENGES

- Working on in a new programming language, especially using C++ arrays
- Placing things inside loops by mistake, or not accounting for variables that are missing within the loop
- Editing parts of the code, but then leaving in a part of code that overlaps, leading to some variable occurring twice
- Specifically for the Josephus problem, realising that we hadn't accounted for lists with 1 or fewer entries, leading to some weird behaviours
- Consulting lecture notes or the internet when stuck
- Running different parts of the code with print statements to find out where errors were

PROJECT 2: TESTING

Testing on the go:

- Running the program for each new method to check for syntax errors
- Printing in different parts of a method when it didn't work, or to check that conditions were triggered
- Printing different lists to see if they returned the expected values
- For array and linked list we tested all the methods to see if they worked as expected

Josephus problem:

- For $k = 2$ we found a general solution and implemented a test that checks it for random variables of n .
- For k values between 3 and 5 we tested a smaller set of n values to their expected values