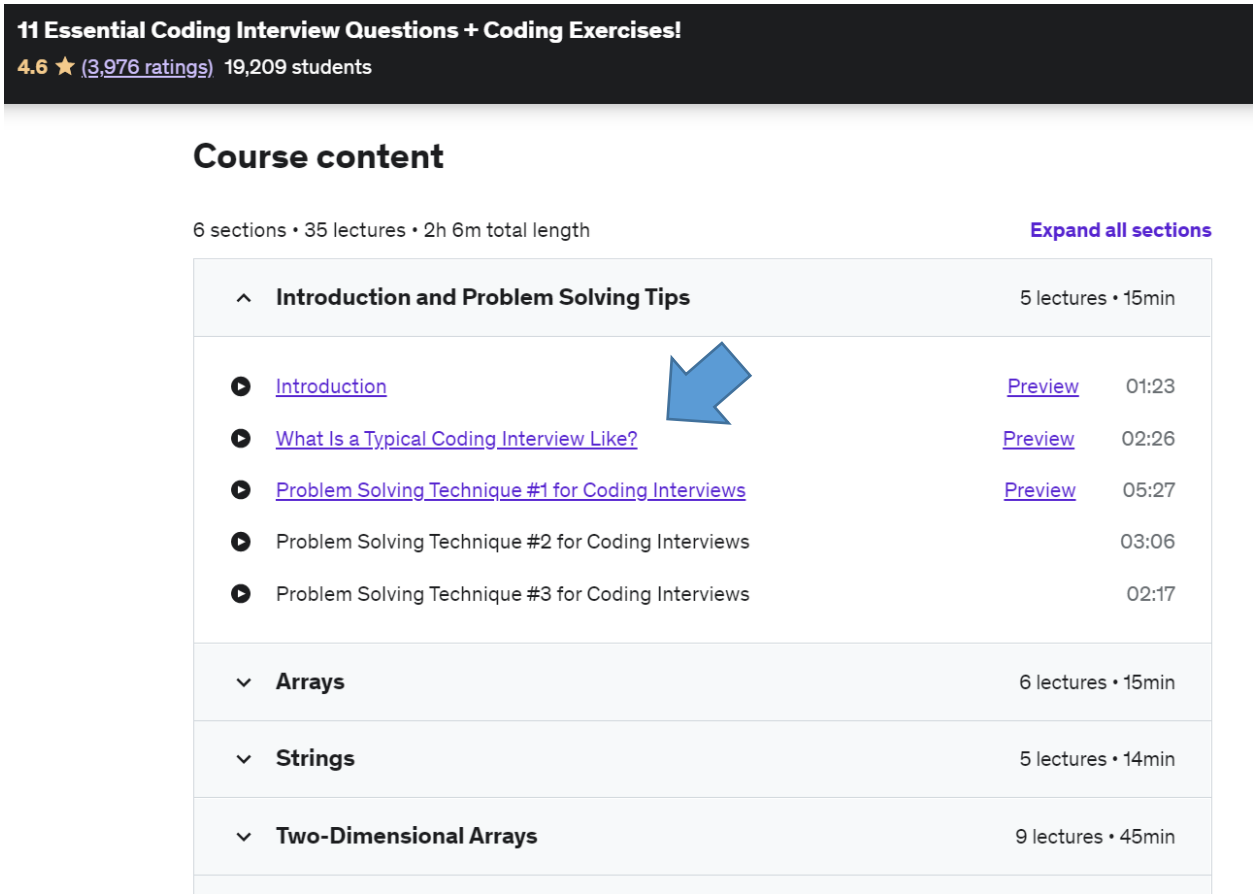
INTRODUCTION and USE OF DATA STRUCTURE

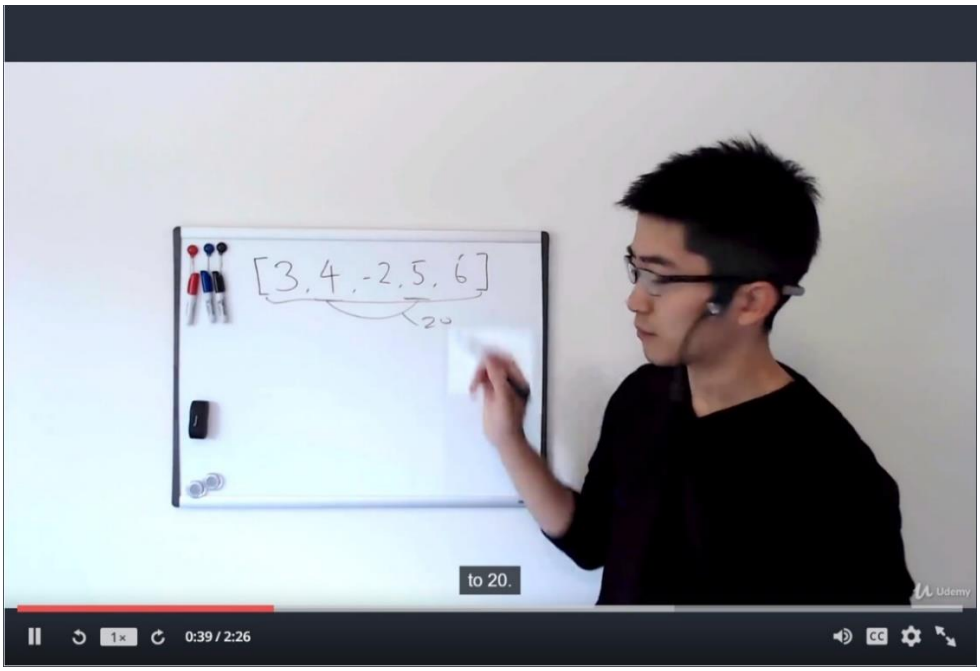
Preliminary

Go to the following link: [Top Coding Interview Questions (Essential to Getting Hired) | Udemy]



Watch the following video (2:26 minutes long!)

It is the one titled “What Is A Coding Interview Like”



This is a real coding interview question !!!

Questions like this are also asked in the interview with Google, Facebook, Microsoft, Amazon, etc.

THIS COURSE IS ABOUT THESE COMPUTATIONAL PROBLEMS!

Example learning session runthrough

Multiply2K-testcases.zip contains 5 test cases for this problem.

- The only number in the first line is the targeted product, K.
- The second line contains list of numbers.
- Max, Min possible values of any number are 12999709, -12999709
- "in" operation, of any collection of data e.g. list, set, dictionary, is not allowed for searching. However, it is allowed for iterating through list.

1) Develop a naïve solution for this problem. The naïve solution consists of nested for loop, one for each number to be considered, and if the multiplication matches the value K, the program breaks out of the loop and print result.

2) The running time for the processing part of the code can be calculated as follows.

```
import time

start_time = time.process_time()

# part of the code to measure running time

end_time = time.process_time()
running_time = end_time - start_time
```

3) Run the naïve solution against the provided test cases. What is the largest test case that takes no more than 1 second?

4) A faster solution, without using "in" operation, is to utilize "Direct Address Table". Because you are supposed to have studied it already in Data Structure course, the following provides only brief concept. Search on the internet if you need more elaborated review.

   If key exists, DAT[key] = True, otherwise DAT[key] = False

   For this problem, what would be the size of DAT?

5) Write a program for this problem that utilizes Direct Address Table. A correct code will finish solving every provided test case within 1 second.

6) An alternative fast solution is to utilize Binary Search. It is recommended for proficient student who enjoys a little more challenge to try.