



Data Structures & Algorithms Group Study

An abstract graphic design featuring a light gray dashed grid. Two thick, wavy lines, one black and one red, flow across the composition. The black line starts at the top left, dips into the middle section, and then rises into the bottom section. The red line starts at the top left, dips into the top section, and then rises into the bottom section. The text '01 WHY', '02 WHAT', and '03 HOW' is arranged vertically on the left side, with '01' in red and 'WHY' in black, '02' in red and 'WHAT' in black, and '03' in red and 'HOW' in black.

01

WHY

02

WHAT

03

HOW



01

WHY DATA
STRUCTURES &
ALGORITHMS?

what are computer science & software engineering?

“There’s this running joke...that all software engineers do on a daily basis is **move data from one service to another...**”



core ideas

- The core objective of computer science and software engineering is **problem-solving**
- Before the plethora of choices in programming languages and ever-advancing computing power, there were **core principles in problem-solving with code**
- Understanding **how to implement the solution proposed by the algorithm** with a programming language is a separate (but critical) skill

where will I use this?

INTERVIEWS

> companies test this knowledge to understand your problem-solving capacity

PROBLEM SOLVING

> often a brute-force solution will work in the short term, but it's not a sustainable way to approach problems

PERSONAL DEVELOPMENT

> ds&a will help you grow from a beginner to an intermediate developer, etc.

why is this more critical than ever?

INCREASING COMPLEXITY

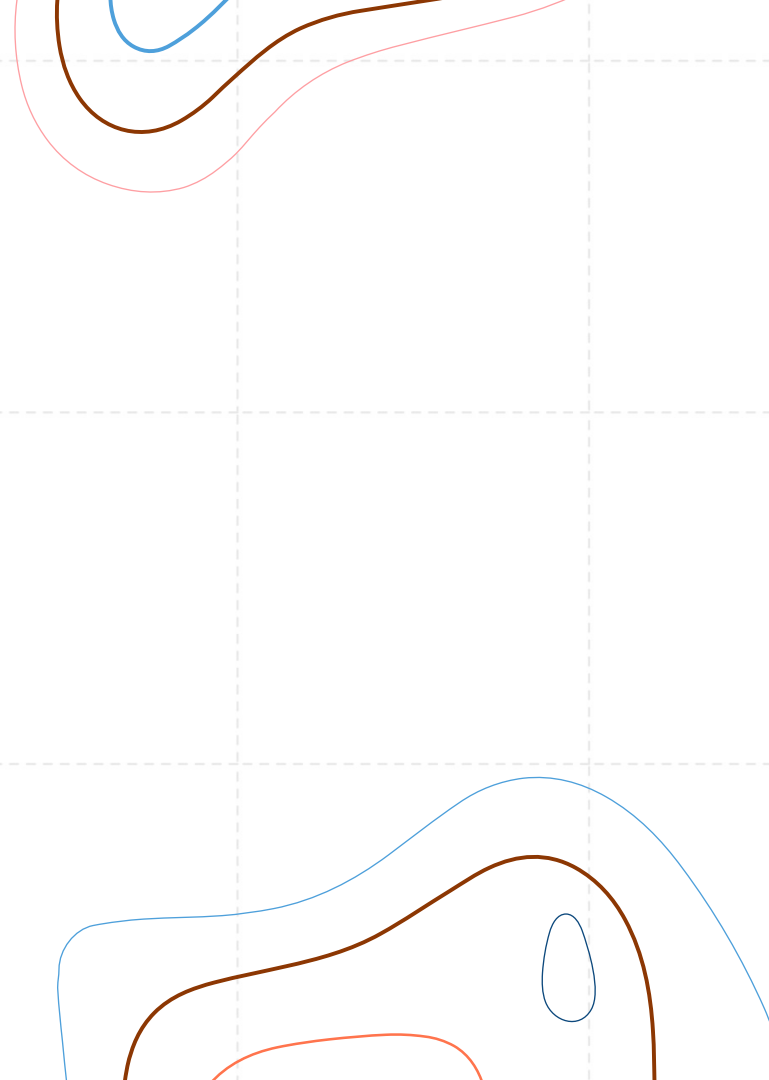
> faster processors,
high-speed networks & large
memory capacities mean
more challenges to navigate

PLETHORA OF PROGRAMMING LANGUAGES

> many have felt the
overwhelm of choosing one
programming language to
specialize in, or the pressure
to continue making these
decisions as the popularity
of various technologies
fluctuate over time. Building
a strong foundation in the
core CS principles alleviates
this pressure

LARGE SCALE PROJECTS

> you can't scale brute-force
solutions. As computing
power allows for the
development of massive
projects, efficient and
universal principles must be
used

The image features decorative contour lines in the top right and bottom right corners. These lines are drawn in blue, brown, and red, creating a map-like aesthetic. The background is a light gray grid with dashed lines.

02

WHAT ARE DATA
STRUCTURES &
ALGORITHMS?

what are data structures & algorithms?

DATA STRUCTURES

> method of organizing data
in a virtual system

ALGORITHMS

> a sequence of steps
executed by a computer that
takes an input and
transforms it into a target
output



03

HOW DO I STUDY
DATA STRUCTURES
& ALGORITHMS?



core topics

DATA STRUCTURES

SORTING

ORDER STATISTICS

GRAPH ALGORITHMS

ADVANCED DESIGN

MISC.

- > linear programming
- > multithreaded algorithms
- > approx. algorithms



01

CONCEPT

02

EXAMPLES

03

EXERCISES



04

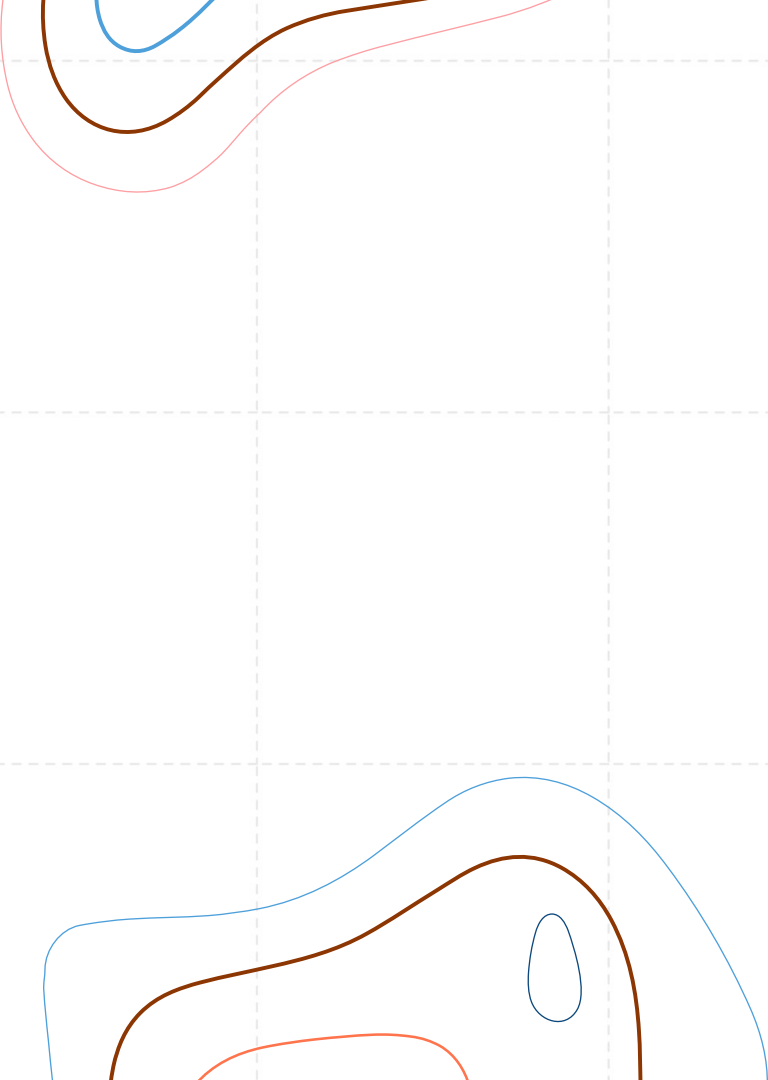
REGULAR LEETCODE PRACTICE

05

CASE STUDIES

06

APPLY TO CODING PROBLEMS

The image features decorative contour lines in the corners. The top-left corner shows a blue line, a brown line, and a pink line. The bottom-left corner shows a blue line, a brown line, and a pink line. The background is a light gray grid with dashed lines.

00

GETTING
INVOLVED



01

STUDY THE CONCEPT

02

IDENTIFY EXAMPLES

03

FIND EXERCISES

core requirements

COLLABORATIVE

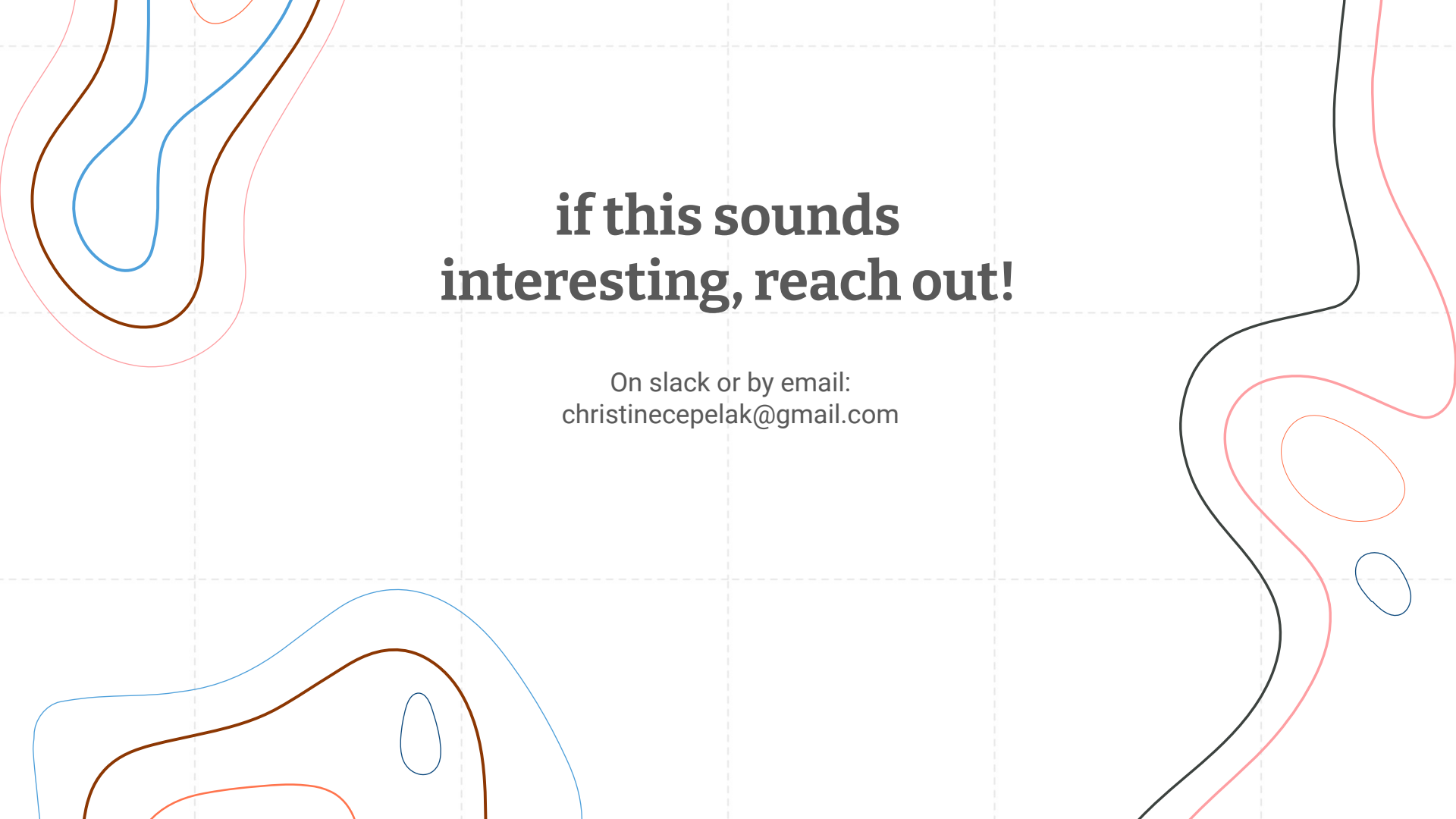
> consider pedagogy & follow our examples. Engage in ongoing sharing and conversation within our community. Let people know what's going on

CITED

> do meaningful research & include notes with all your resources. Not all information on the internet is considered equal, and we only want to spend time with quality and correct material

PROFESSIONAL

> Treat others like colleagues! Value their time, and consider the needs of your fellow volunteers and 'students'



**if this sounds
interesting, reach out!**

On slack or by email:
christinecepelak@gmail.com



THANKS!

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