

Overview

Week 1

Week 2

Week 3

Week 4

Week 5

Week 6

Grades

Notes

Discussion Forums

Messages

Resources

Course Info



Get 50% off when you invite a friend to learn on Coursera. [Terms and conditions](#)  
Learn more



# Week 1

Algorithmic Toolbox

## Week 1

Discuss and ask questions about Week 1.

Go to forum

28 threads · Last post 10 hours ago

## Programming Challenges



Welcome to the first module of Data Structures and Algorithms! Here we will provide an overview of where algorithms and data structures are used (hint: everywhere) and walk you through a few sample programming challenges. The programming challenges represent an important (and often the most difficult!) part of this specialization because the only way to fully understand an algorithm is to implement it. Writing correct and efficient programs is hard; please don't be surprised if they don't work as you planned—our first programs did not work either! We will help you on your journey through the specialization by showing how to implement your first programming challenges. We will also introduce testing techniques that will help increase your chances of passing assignments on your first attempt. In case your program does not work as intended, we will show how to fix it, even if you don't yet know which test your implementation is failing on.

Less

## Learning Objectives

- Practice implementing algorithms
- Practice testing and stress testing programs
- Compare fast and slow programs
- Practice solving programming challenges

Less

## Welcome



Video: Welcome! 3 min

Resume



Reading: Companion MOOCBook 10 min



Reading: What background knowledge is necessary? 10 min



Pre-survey on HSE online courses 4 min

## Programming Assignment 1: Programming Challenges



Video: Solving the Sum of Two Digits Programming Challenge (screencast) 6 min



Programming Assignment: Programming Assignment 1: Sum of Two Digits 1h

Due Jul 26, 1:59 AM CDT

## (OPTIONAL) Solving The Maximum Pairwise Product Programming Challenge in C++



Reading: Optional Videos and Screencasts 10 min



Video: Solving the Maximum Pairwise Product Programming Challenge: Improving the Naive Solution, Testing, Debugging


13 min




Video: Stress Test - Implementation 8 min




Video: Stress Test - Find the Test and Debug 7 min


 **video:** Stress Test - More Testing, Submit and Pass! 8 min


 **Reading:** Alternative testing guide in Python 10 min

---

### Maximum Pairwise Product Programming Challenge


 **Reading:** Maximum Pairwise Product Programming Challenge 10 min

 **Practice Quiz:** Solving Programming Challenges 5 questions

 **Programming Assignment:** Programming Assignment 1: Maximum Pairwise Product 2h Due Jul 26, 1:59 AM CDT


---

### Using PyCharm to solve programming challenges (optional experimental feature)

 **Reading:** Using PyCharm to solve programming challenges 10 min

---

### Acknowledgements (Optional)

 **Reading:** Acknowledgements 2 min

