Pointers, Arrays, and Recursion

About this Course

4.5 (9 ratings) • 9 reviews

The third course in the specialization Introduction to Programming in C introduces the programming constructs pointers, arrays, and structures. Pointers provide control and flexibility when programming in C by giving you a way to refer to the location of other data. Arrays provide a way to bundle data by guaranteeing sequence of data. SHOW ALL

Course 3 of 4 in the Introduction to Programming in C Specialization

100% online
Start instantly and learn at your own schedule.

Flexible deadlines
Reset deadlines in accordance to your schedule.

Beginner Level

Approx. 17 hours to complete
Suggested: 4 weeks of study, 4-8 hours/week

English
Subtitles: English

Syllabus - What you will learn from this course

WEEK 1

5 hours to complete

Pointers

Pointers are one of the most important and powerful aspects of the C language. Pointers are critical to understanding arrays, which let you manipulate sequences of data. They also give a programmer control and flexibility when... SHOW ALL

5 videos (Total 70 min), 9 readings, 1 quiz • SEE LESS

5 videos

Introduction to Pointers, Arrays, and Recursion 10m

Name Swap 2m

Pointers 2m

Corrected Swap 2m

Swap with Hardware 3m

10 readings

Pointer Basics 10m

Pictures 10m

Swap Revisited 10m

The Practice Programming Environment 10m

Assignment 1.2_read_pict 10m

Pointers under the Hood 10m

A Program's View of Memory 10m

Misc. 10m

Pointers to Bools 10m

Pointers to Pointers 10m

Lend 10m

Aliasing 10m

Pointer Arithmetic 10m

Use Memory Checker Tools 10m

Assignment 1.3_read_ptr 10m

2 practice exercises

Pointer Conceptually 10m

Pointers in Hardware 30m

Pointers in Sophisticated Types 30m

WEEK 2

5 hours to complete

Arrays

Arrays are sequences of memory of the same type that are guaranteed to be one after another. This is an incredibly useful data format, and allows us to store many things together under one variable name. In this module, you will lea... SHOW ALL

5 videos (Total 70 min), 9 readings, 1 quiz • SEE LESS

5 videos

Array Access with Pointer Arithmetic 20s

Array Access with Pointer Indexing 10s

Index of a Large Element 30s

Closure Point Step Through 3m

Dangling Pointers 3m

9 readings

Cryptography Motivation 10m

Array Declaration and Initialization 10m

Accessing an Array 10m

Passing Arrays as Parameters 10m

Writing Code with Arrays 10m

Assignment 1.5_read_arr1 10m

Dangling Pointers 10m

Array Size 10m

Assignments 1.6_array_max, 1.7_bars_subway, 1.8_subway 10m

1 practice exercise

Array Basics 30m

WEEK 3

4 hours to complete

Uses of Pointers

Now that you have mastered the basics of pointers and arrays, it is time to see some important uses of them. In this module, you will learn about how to manipulate strings and multi-dimensional arrays. You will also learn about functio... SHOW ALL

5 videos (Total 23 min), 16 readings, 1 quiz • SEE LESS

4 videos

Compare Two Strings 7m

Copy a String 6m

Incompatible Representations 5m

Buffer Overflow 4m

10 readings

String Literals 10m

Reusable Strings 10m

String Equality 10m

String Copying 10m

Converting Strings to Ints 10m

Standard Library Functions 10m

Assignments 1.7_read_pict and 1.9_reverse_str 10m

Introduction 10m

Declaration 10m

Indexing 10m

Initializing 10m

Arrays of Pointers 10m

Incompatibility 10m

Arrays of Strings 10m

Assignments 1.9_pict_str and 1.10_mp_matrix 10m

Function Pointer Basics 10m

Sorting Functions 10m

Partial String Attacks 10m

2 practice exercises

Function Pointers 30m

Security Hazards 30m

WEEK 4

5 hours to complete

Recursion

Now that you have learned about pointers and arrays, you will build on the code you wrote in Course 2 to build a dent of units and evaluate a postfix hand. In the next course, you will complete the program to calculate power odds ou... SHOW ALL

5 videos (Total 67 min), 10 readings, 1 quiz • SEE LESS

4 videos

Executing Recursive Functions by Hand 2m

Writing Iterative Recursively 10m

Translating Recursive Functional to Code 1m

Writing Iterative Recursively 5m

Translate Recursive Recursive to Code 4m

Duplication of Computation in Fibonacci 7m

Execution of the Tail Recursive Implementation of factorial 4m

Execution of Iterative Recursive Code and Values 7m

10 readings

Introduction to Recursion 2m

Reading Recursive Code 10m

Principle of Writing Recursive Code 10m

Is Recursion Great? 10m

Assignment 2_read_rec1 10m

Tail Recursion 10m

Equivalence of Tail Recursion and Iteration 10m

Manual Recursion 10m

Assignments 2.2_eval_power and 2.3_power_rec 10m

Optimized Recursion Theory 10m

2 practice exercise

Reading Recursion 30m

5 hours to complete

Project

Now that you have learned about pointers and arrays, you will build on the code you wrote in Course 2 to build a dent of units and evaluate a postfix hand. In the next course, you will complete the program to calculate power odds ou... SHOW ALL

5 readings • 1 quiz • SEE LESS

5 readings

If you did not take Course 2, ... 10m

Building a Dent 2m

Assignment 2.5pict_dent 10m

Evaluating a Hand 10m

Assignment 2.6pict_hand 10m

Show Less

4.5 ★★★★★

9 Reviews

Top Reviews

★★★★★ by Eric • AUG 12th 2016

Kind of course project was challenging and fun. Lectures were well organized and easy to debug. Homework issues well outgrown

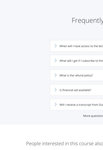
Instructors

Andrew D. Hilton
Associate Professor of the Practice
Electrical and Computer Engineering

Anne Bracy
Senior Instructor
Computer Science (Undergraduate)

Genevieve M. Lipp
Adjunct Professor
Electrical and Computer Engineering (Undergraduate)

Liz Wendland



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About the Introduction to Programming in C Specialization

The specialization develops core programming concepts using fundamentals for C programming, including variables, data types, conditionals, loops, functions, and arrays. Through five courses, you will learn to develop algorithms in a systematic way and read and write the C code to implement it... MORE

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