



< Computer Science

Algorithms, Part I

★★★★★ 4.9 7,486 ratings | 👍 98%



Kevin Wayne [+1 more instructor](#)

Offered By



Enroll for Free

Starts Aug 24

698,042 already enrolled

About Instructors Syllabus Reviews Enrollment Options



About this Course

ABOUT THIS COURSE

997,806 recent views

This course covers the essential information that every serious programmer needs to know about algorithms and data structures, with emphasis on applications and scientific performance analysis of Java implementations. Part I covers elementary data structures, sorting, and searching algorithms. Part II focuses on graph- and string-processing

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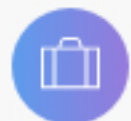


Learner Career Outcomes



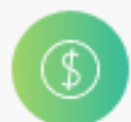
32%

started a new career after completing these courses



34%

got a tangible career benefit from this course



17%

got a pay increase or promotion



100% online

Start instantly and learn at your own schedule.



Flexible deadlines

Reset deadlines in accordance to your schedule.



Intermediate Level



Approx. 53 hours to complete



English

Subtitles: English, Korean, Russian

SKILLS YOU WILL GAIN

Data Structure

Algorithms

Java Programming

Instructors

Instructor rating 🏆 4.79/5 (569 Ratings) ⓘ



Kevin Wayne

Phillip Y. Goldman '86 Senior Lecturer

Computer Science

👤 783,995 Learners

📖 4 Courses




Robert Sedgewick

William O. Baker *39 Professor of Computer Science

Computer Science

 804,237 Learners

 6 Courses

Offered by



Princeton University

Princeton University is a private research university located in Princeton, New Jersey, United States. It is one of the eight universities of the Ivy League, and one of the nine Colonial Colleges founded before the American Revolution.



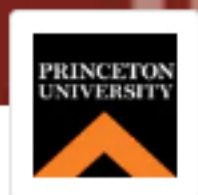
Coursera's rigorous



assignments and broad range of subjects encourage me to keep up with my courses. The quality of the teachers keeps me coming back.

— *Sandra O.*

People interested in this course also viewed



Algorithms, Part II

Princeton University

1 COURSE

Syllabus - What you will learn from this course

Content Rating  98% (52,206 ratings) 

WEEK 1

Course Introduction

Welcome to Algorithms, Part I.



10 minutes to complete



1 video (Total 9 min), 2 readings [SEE ALL](#)

Union-Find

We illustrate our basic approach to developing and analyzing algorithms

by considering the dynamic connectivity problem. We introduce the union-find data type and consider several implementations. [Quick find](#)
[SHOW ALL](#)



9 hours to complete



5 videos (Total 51 min), 2 readings, 2 quizzes [SEE ALL](#)

Analysis of Algorithms

The basis of our approach for analyzing the performance of algorithms is the scientific method. We begin by performing computational experiments to measure the running times of our programs. We use
[SHOW ALL](#)



1 hour to complete



6 videos (Total 66 min), 1 reading, 1 quiz [SEE ALL](#)

WEEK 2

Stacks and Queues

We consider two fundamental data types for storing collections of objects: the stack and the queue. We implement each using either a singly-linked list or a resizing array. We introduce two advanced laws
[SHOW ALL](#)



9 hours to complete



6 videos (Total 61 min), 2 readings, 2 quizzes [SEE ALL](#)

Elementary Sorts

We introduce the sorting problem and Java's Comparable interface. We study two elementary sorting methods (selection sort and insertion sort) and a variation of one of them (shellsort). We also consider two

[SHOW ALL](#)



1 hour to complete



6 videos (Total 63 min), 1 reading, 1 quiz [SEE ALL](#)

WEEK 3

Mergesort

We study the mergesort algorithm and show that it guarantees to sort any array of n items with at most $n \lg n$ compares. We also consider a nonrecursive, bottom-up version. We prove that any compare-based

[SHOW ALL](#)



9 hours to complete



5 videos (Total 49 min), 2 readings, 2 quizzes

[SEE ALL](#)

Quicksort

We introduce and implement the randomized quicksort algorithm and analyze its performance. We also consider randomized quickselect, a quicksort variant which finds the k th smallest item in linear time. Finally, [SHOW ALL](#)



1 hour to complete



4 videos (Total 50 min), 1 reading, 1 quiz

[SEE ALL](#)

WEEK 4

Priority Queues

We introduce the priority queue data type and an efficient implementation using the binary heap data structure. This implementation also leads to an efficient sorting algorithm known as [SHOW ALL](#)



9 hours to complete



4 videos (Total 74 min), 2 readings, 2 quizzes

[SEE ALL](#)

Elementary Symbol Tables

We define an API for symbol tables (also known as associative arrays, maps, or dictionaries) and describe two elementary implementations using a sorted array (binary search) and an unordered list (sequential search).

[SHOW ALL](#)



1 hour to complete




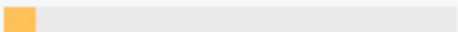
6 videos (Total 77 min), 1 reading, 1 quiz [SEE ALL](#)

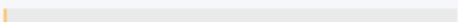
Show More

Reviews

4.9 ★★★★★
1561 reviews

5 stars  91.86%

4 stars  6.85%

3 stars  0.74%

3 stars	<div></div>	0.74%
2 stars	<div></div>	0.17%
1 star	<div></div>	0.36%

TOP REVIEWS FROM ALGORITHMS, PART I



by RM Jun 1, 2017

This is a great class. I learned / re-learned a ton. The assignments were challenge and left a definite feel of accomplishment. The programming environment and automated grading system were excellent.



by RB Jun 1, 2020

The course focuses on Java specific implementations of algorithms, so if you're not from a Java background, you would have a little difficulty with the assignments. The course content however is great.



by BJ Jun 3, 2018

Good contents and the logic of the whole course structure is very clear for a novice like me. The weekly homework is also awesome. Would recommend to anyone who wants to learn about computer science.



by RP Jun 11, 2017

Incredible learning experience. Every programmer in industry should take this course if only to dispel the idea that with the advent of cloud computing exponential algorithms can still ruin your day!

[View all reviews](#)

Start Learning Today

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Frequently Asked Questions

> When will I have access to the lectures and assignments?

> Do I need to pay for this course?

> Can I earn a certificate in this course?

> I have no familiarity with Java programming. Can I still take this course?

> Which algorithms and data structures are covered in this course?

> Which kinds of assessments are available in this course?

> I am/was not a Computer Science major. Is this course for me?

> How does this course differ from Design and Analysis of Algorithms?

More questions? Visit the [Learner Help Center](#).

AI for Everyone

Introduction to TensorFlow

Neural Networks and Deep Learning

Algorithms, Part 1

Algorithms, Part 2

Machine Learning

Machine Learning with Python

Machine Learning Using Sas Viya

R Programming

Intro to Programming with Matlab

Data Analysis with Python

AWS Fundamentals: Going Cloud Native

Google Cloud Platform Fundamentals

Site Reliability Engineering

Speak English Professionally

The Science of Well Being

Learning How to Learn

Financial Markets

Hypothesis Testing in Public Health

Foundations of Everyday Leadership

Top Online Specializations

Deep Learning

Python for Everybody

Data Science

Applied Data Science with Python

Business Foundations

Architecting with Google Cloud Platform

Data Engineering on Google Cloud Platform

Excel Engineering on Google Cloud Platform

Excel to MySQL

Advanced Machine Learning

Mathematics for Machine Learning

Self-Driving Cars

Blockchain Revolution for the Enterprise

Business Analytics

Excel Skills for Business

Digital Marketing

Statistical Analysis with R for Public Health

Fundamentals of Immunology

Anatomy

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