

# Data Structures I: Introduction to the Course



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# Cocktail of the day: Piña Colada



- 30 ml white rhum
- 30 ml cocunut milk
- 90 ml pineapple juice



Employers are looking for specific business and technology skills. According to sources like PayScale and Monster.com<sup>1</sup>, these 13 are among the most likely to make you stand out.

## Most valuable COMPUTER SCIENCE skills

<p><b>SKILL #1</b> <b>Scala<sup>1</sup></b></p> <p><i>22% average pay boost</i></p> <p>Apply functional programming paradigms to write elegant Scala code.</p>	 <p><b>Functional Programming in Scala</b></p> <p>EPM Escuela de Ciencias</p> <p><a href="#">Join Now</a></p>
<p><b>SKILL #2</b> <b>Algorithm Development<sup>1</sup></b></p> <p><i>17.8% average pay boost</i></p> <p>Solve software problems by designing optimized algorithms.</p>	 <p><b>Data Structures and Algorithms</b></p> <p>UC San Diego</p> <p><a href="#">Join Now</a></p>
<p><b>SKILL #3</b> <b>Java<sup>1</sup></b></p> <p><i>9% average pay boost</i></p> <p>Use Java to build, test, and debug robust software applications.</p>	 <p><b>Java Programming and Software Engineering Fundamentals</b></p> <p>Duke University</p> <p><a href="#">Join Now</a></p>

The world's most valuable resource is no longer oil, but data



[https://www.economist.com/leaders/2017/05/06/  
the-worlds-most-valuable-resource-is-no-longer-oil-but](https://www.economist.com/leaders/2017/05/06/the-worlds-most-valuable-resource-is-no-longer-oil-but)

<https://www.youtube.com/watch?v=Q9HjeFD62Uk>



“Las nuevas tecnologías acabaron con el monopolio del saber del maestro. Hoy la información está toda allá arriba. A un click, tú puedes bajar toda la información que quieras, en tiempo real. Yo creo que nunca antes la humanidad había vivido un momento tan apasionante. ¿Entonces cuál es el papel del maestro ahora? Es un compañero de viaje al conocimiento.” – Juan Luis Mejía, Eafit.



Instrument



Dream business



Dream business



P. Language

$$\begin{aligned}s_0 &\stackrel{\Delta}{=} a.s1 + d.s2 + a.s4 \\ s_1 &\stackrel{\Delta}{=} b.s0 \\ s_2 &\stackrel{\Delta}{=} b.s3 \\ s_3 &\stackrel{\Delta}{=} a.s0 + a.s5 \\ s_4 &\stackrel{\Delta}{=} d.s1 + a.s5 \\ s_5 &\stackrel{\Delta}{=} c.s3\end{aligned}$$



SE area

Martial arts

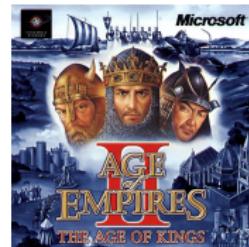
# My interests (2)



Favorite Sport



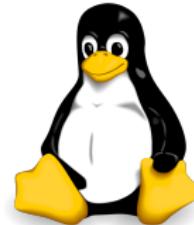
Birth place



Video game



Teaching



OS



High School



Language Studied



University



Thesis



Language Studied



University



PhD Thesis



Language Studied



University  
of Cyprus



University

Topic



Language Studied



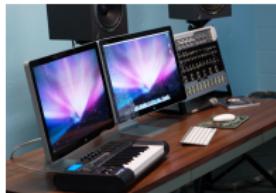
University



Innovation



Research



Research



Research

- **Summations** <https://miriadax.net/web/estadistica-descriptiva-5edicion>
- **Logarithms** <https://miriadax.net/web/matematicas-esenciales-en-los-numeros-reales-y-complejos-5edicion>
- **Programming** <https://www.coursera.org/learn/java-programming>

- Sorting
- Searching
- Graph problems
- String processing
- Numerical problems
- Geometric problems
- Combinatorial problems

Taken from [Lev12]

- 1 Solve an algorithmic problem using fundamental data structures, calculate the algorithm complexity and argument the selection criteria of the data structures

More information: <http://interactiva.eafit.edu.co/>

- 1 Recursion**
- 2 Complexity of algorithms**
- 3 Lists, Stacks, Hash tables and Queues**
- 4 Graphs and Trees**

More information: <http://interactiva.eafit.edu.co/>

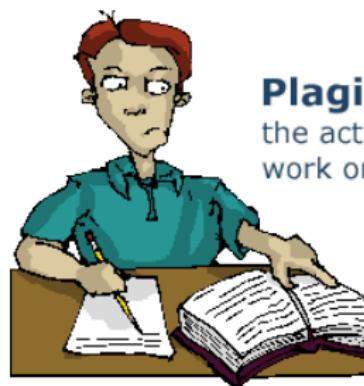
- 3 deliverables for final project (two-persons): 30%
- 5 laboratories (two-persons): 20%
- Class work (two-persons): 5%
- 1st midterm (individual): 20%
- 2nd midterm (individual): 25%



- <http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-006-introduction-to-algorithms-fall-2011/lecture-videos/>
- <http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-006-introduction-to-algorithms-spring-2008/>
- <http://www.extension.harvard.edu/academics/courses/data-structures-algorithms/21462>
- <https://www.coursera.org/course/alg4partI>
- <https://www.coursera.org/course/alg4partII>
- <https://www.coursera.org/learn/algorithm-design-analysis>
- <https://www.coursera.org/specializations/java-programming>



- Please learn how to reference images, trademarks, videos and fragments of code.
- Avoid plagiarism

**Plagiarism:**

the act of presenting another's work or ideas as your own.

Figure: Figure about plagiarism, University of Malta [Uni09]

 Anany V. Levitin.

*Introduction to the Design and Analysis of Algorithms.*

Addison-Wesley Longman Publishing Co., Inc., Boston, MA,  
USA, 2012.

 University of Malta.

Plagiarism — The act of presenting another's work or ideas as  
your own, 2009.

[Online; accessed 29-November-2013].

## ■ Complexity of algorithms

- Thomas Cormen, Introduction to Algorithms (3th edition), 2009. Chapter 4.

