A First Course in Computer Science

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Overview

- The need for computer professionals
- A first course in computer science
- Java and supporting environments
- The ACM library
- Sample problems and solutions
- Resources
The Need for Computer Professionals

Between 2004 and 2014

The fastest growth and largest increase in sheer numbers will be in professional occupations like information technology specialists, teachers and engineers. Such jobs are forecast to grow by 6 million, or 21.2%.

Forbes, online, 2/20/06
http://www.forbes.com/
Bureau of Labor Statistics Projections

Computer and mathematical science occupations

<table>
<thead>
<tr>
<th></th>
<th>2004</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>3,152,800</td>
<td>4,119,800</td>
</tr>
<tr>
<td>Distribution</td>
<td>2.2%</td>
<td>2.5%</td>
</tr>
<tr>
<td>Change</td>
<td>+967,000</td>
<td>30.7%</td>
</tr>
</tbody>
</table>

http://www.bls.gov/emp/home.htm#outlook
Recent Starting Salaries

<table>
<thead>
<tr>
<th>Major</th>
<th>Salary</th>
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<tbody>
<tr>
<td>Chemical engineering</td>
<td>$55,900</td>
</tr>
<tr>
<td>Electrical engineering</td>
<td>$52,899</td>
</tr>
<tr>
<td>Mechanical engineering</td>
<td>$50,672</td>
</tr>
<tr>
<td>Computer science</td>
<td>$50,046</td>
</tr>
<tr>
<td>Accounting</td>
<td>$45,723</td>
</tr>
<tr>
<td>Economics/Finance</td>
<td>$45,191</td>
</tr>
<tr>
<td>Civil engineering</td>
<td>$44,999</td>
</tr>
<tr>
<td>Business administration</td>
<td>$39,850</td>
</tr>
<tr>
<td>Marketing</td>
<td>$36,260</td>
</tr>
<tr>
<td>Liberal arts</td>
<td>$30,828</td>
</tr>
</tbody>
</table>

money.cnn.com/2006/02/13/pf/college/starting_salaries/index.htm
Problem solving skills

Design and implement computer–based solutions

Use and implement common algorithms and data structures

Develop and select algorithms and data structures

Be familiar with a Java subset

Comprehend a large program involving several classes
Why Java?

- Ubiquitous
- The Advanced Placement exam language since 2004
- Architecture neutral and portable
- Freely available
- Object oriented language
- Web–based applications (applets)
Supporting Environments for Java

Integrated Development Environments
- NetBeans
- Eclipse
- BlueJay
- ...

Editor with Java syntax awareness

Build and run programs

Debugging options
The ACM Library

Designed by ACM’s Java Task Force

Supports modern environments

- Graphics
- Graphical User Interfaces
- Event driven programming

Simplifies Java while retaining the power

Three simple types of programs: console, graphics, and dialog

Freely available on Internet
Sample Problems and Solutions
Resources

Eric Roberts, *The Art and Science of Java*
  www.aw.com

ACM Library
  jtf.acm.org

Java
  java.sun.com

Mathematics 2170 - Computer Science I
  www.eiu.edu/~mathcs/mat2170