Introduction to Computer Science I

Summary and Applications

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Computer Science is

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Computer Science is

- is a process of computation,
- is more than programming,
- is applicable to many fields,
- since technology is everywhere
What is Computer Science?
What is Computer Science?

Programming → Java
Variables

int temp;

Data Types

int double char ...

Expressions

temp = temp + 10;

Conversion

(double) temp = 10.5;
double new_temp = temp+10.5;
int temp;

int double char ...

temp = temp +10;

(double) temp = 10.5;
double new_temp = temp+10.5;

Existing classes:
Scanner, Random, Math, String, Iterators, ArrayList
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Writing Algorithms:
Conditionals (if, if/else, switch)
Repetition (while, do/while, for)
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Applications:
Math
Music
Art
Bioinformatics
Robotics

Creating new classes, methods

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Conditionals (if, if/else, switch)
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Creating new classes, methods

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Applications:
- Math
- Music
- Art
- Bioinformatics
- Robotics

Tools:
- Slack
- Bitbucket
- Linux
- Eclipse
- Gvim
What is Computer Science?

- Team work
- Computational Thinking
- Programming → Java
- Problem Solving
- Creativity
Using Computer Science you can:

- Develop technology
Using Computer Science you can:

- Develop technology
- Study the usability of technology
Using Computer Science you can:

- Develop technology
- Study the usability of technology
- Design IT infrastructure
Using Computer Science you can:

- Develop technology
- Study the usability of technology
- Design IT infrastructure
- Solve problems in other fields
1,000,000 more jobs than students by 2020

- $500 billion opportunity
- 1.4 million computing jobs
- 400,000 computer science students

Computer science is a top paying college degree and computer programming jobs are growing at 2X the national average.
The Job/Student Gap

Computer Science Students

STUDENTS
All other math and science students 98%

2%

Computing Jobs

JOBS
All other math and science jobs 40%

60%

Sources: College Board, Bureau of Labor Statistics, National Science Foundation
<table>
<thead>
<tr>
<th>Job Title</th>
<th>Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software Engineer</td>
<td>$93,000</td>
</tr>
<tr>
<td>Systems Engineer</td>
<td>$91,000</td>
</tr>
<tr>
<td>Software Developer</td>
<td>$89,000</td>
</tr>
<tr>
<td>Java Developer</td>
<td>$98,000</td>
</tr>
<tr>
<td>Business Analyst</td>
<td>$84,000</td>
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<tr>
<td>.Net Developer</td>
<td>$91,000</td>
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<tr>
<td>Web Developer</td>
<td>$82,000</td>
</tr>
<tr>
<td>Systems Administrator</td>
<td>$77,000</td>
</tr>
<tr>
<td>Project Manager</td>
<td>$93,000</td>
</tr>
<tr>
<td>Network Engineer</td>
<td>$91,000</td>
</tr>
</tbody>
</table>

In USD as of Sep 17, 2012

35k 70k 105k
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Computational Thinking

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- Programming helps to develop computational thinking skills
Computational Thinking

- Now, computing is becoming recognized as a new literacy
- Programming helps to develop computational thinking skills
- High-level (object-oriented) programming makes programming accessible
Programming helps with

- Problem solving skills
- Critical thinking skills
- Analysis
- Computational thinking
- Understanding underlying technologies
Java is Used in Many Companies/Industries

- Google (gmail)
- Facebook
- Ebay
- Kayak
- Amazon
- Netflix
- Linked In
- AT & T
- e-banking (Bank of America)
- Some blue-ray players
- etc.
Java Benefits

- Write once, run everywhere
- Network-centric
- Internationalization
- Performance
- Programmer Efficiency
There is more

- A lot more programming techniques than covered in this class
- A lot of other programming languages and tools
- Learning never ends