Computational Abstraction (CMPSC 100)

Janyl Jumadinova

August 29, 2018
Keep in Touch

- Email
- Office hours
- Course website (https://cs.allegheny.edu/sites/jjumadinova/teaching/100)
- Teaching assistants (https://www.cs.allegheny.edu/teaching/teachingassistants/)
- Slack channel (more on this later) (https://cs100f2018.slack.com/)
- Github Organization (more on this later) (https://github.com/Allegheny-Computer-Science-100-01-F2018)
What will we explore in this class?

Introduction to the field of computing

Algorithms

Software

Programming Languages - Java

Applications of computer science

DNA manipulation

Graphics

Music
What will we explore in this class?

- Introduction to the field of computing
- Algorithms
- Software
- Programming Languages - Java
- Applications of computer science
What will we explore in this class?

- Introduction to the field of computing
- Algorithms
- Software
- Programming Languages - Java
- Applications of computer science
  - DNA manipulation
  - Graphics
  - Music
Computer Science Involves More than Programming!

- People
- Teams
- Writing
- Speaking
Highlights of this course

- Class Activities
Highlights of this course

- Class Activities
- Laboratory Sessions
Highlights of this course

- Class Activities
- Laboratory Sessions
- Practical Sessions (Fridays)
Highlights of this course

- Class Activities
- Laboratory Sessions
- Practical Sessions (Fridays)
- Challenging Programming
Highlights of this course

- Class Activities
- Laboratory Sessions
- Practical Sessions (Fridays)
- Challenging Programming
- Group Projects
Highlights of this course

- Class Activities
- Laboratory Sessions
- Practical Sessions (Fridays)
- Challenging Programming
- Group Projects
- Fun Presentations
Highlights of this course

- Class Activities
- Laboratory Sessions
- Practical Sessions (Fridays)
- Challenging Programming
- Group Projects
- Fun Presentations
- Real-world Software Tools
Highlights of this course

- Class Activities
- Laboratory Sessions
- Practical Sessions (Fridays)
- Challenging Programming
- Group Projects
- Fun Presentations
- Real-world Software Tools
- New Friends and Colleagues
What is Computer Science?
What is Computer Science?

A quote from a famous computer scientist: “Computer Science is no more about computers than astronomy is about telescopes” Edsger Dijkstra (1930–2002)
What is Computer Science?

- A computation is a sequence of well-defined operations that lead from an initial starting point to a desired final outcome.
What is Computer Science?

A computation is a sequence of well-defined operations that lead from an initial starting point to a desired final outcome.

Computer science is the study of computation.
Computer science is the study of computation
Computer science is the study of computation

- investigating problems that can be solved computationally
Computer science is the study of computation

- investigating problems that can be solved computationally
- programming languages used to describe computations
Computer science is the study of computation

- investigating problems that can be solved computationally
- programming languages used to describe computations
- machines that carry out computations
Computer science is the study of computation

- investigating problems that can be solved computationally
- programming languages used to describe computations
- machines that carry out computations
- theoretical limits of computation (what is or is not computable)
Computer science is the study of computation

- investigating problems that can be solved computationally
- programming languages used to describe computations
- machines that carry out computations
- theoretical limits of computation (what is or is not computable)
- **computational solutions to problems in math, science, medicine, business, education, journalism, ...**
Computer science is the study of computation

- investigating problems that can be solved computationally
- programming languages used to describe computations
- machines that carry out computations
- theoretical limits of computation (what is or is not computable)
- computational solutions to problems in math, science, medicine, business, education, journalism, ...

Computers play a key role
What field has …?

- The third best-rated job in the world?
- 4 of the top 10 highest paid, highest growth jobs?
- Shown strong job growth?
What field has ...?

- The third best-rated job in the world?
- 4 of the top 10 highest paid, highest growth jobs?
- Shown strong job growth?
  - 51,474 students graduate with a degree
- A severe shortage in college graduates?

Computer Science!

122,300 open positions needing that degree!
What field has ...?

- The third best-rated job in the world?
- 4 of the top 10 highest paid, highest growth jobs?
- Shown strong job growth?
  - 51,474 students graduate with a degree
- A severe shortage in college graduates?
  - 122,300 open positions needing that degree!
What field has ...

- The third best-rated job in the world?
- 4 of the top 10 highest paid, highest growth jobs?
- Shown strong job growth?
  - 51,474 students graduate with a degree
- A severe shortage in college graduates?
  - 122,300 open positions needing that degree!

Computer Science!
What field has ...?

- The third best-rated job in the world?
- 4 of the top 10 highest paid, highest growth jobs?
- Shown strong job growth?
  - 51,474 students graduate with a degree
- A severe shortage in college graduates?
  - 122,300 open positions needing that degree!

Computer Science!

4.2 million jobs by 2020
Announcements

- No Lab this week
- Practical session on Friday