Goodbye, world!

NA → NA → NA → NA → NA → NA → NA → NA → NA

Hey → Hey → Goodbye

Hey → Jude

Batman! Katamari Damacy!
Major themes

- Abstraction
  - Leverage existing components without understanding details
  - Create components that can be used as black boxes

- Design tradeoffs
  - Algorithm analysis - scalability and growth
  - Keeping code easy to read for maintainability

- Recursion
  - Reason about problems in terms of self-similarity
  - Write very short code to achieve complex behaviors

- Art – "A programmer who subconsciously views himself as an artist will enjoy what he does and will do it better." (Knuth)
Automate all the things

- Foreign policy: outcome prediction
- Law: evidence summary
- Medicine: smart diagnostics
- Music: hit identification
- Sports: superstar discovery
- Wall Street: high frequency trading
Explore Big Ideas

- Historical context
- Key algorithms
- Privacy
Beyond programming

- Mind-controlled robots
  - [http://www.youtube.com/watch?v=TQ7EOpPNQyw](http://www.youtube.com/watch?v=TQ7EOpPNQyw)

- Muscle-controlled interfaces
  - [http://www.youtube.com/watch?v= pktVSTwC8qo](http://www.youtube.com/watch?v= pktVSTwC8qo)

- 3D models from pictures
  - [http://www.youtube.com/watch?v=25Yifq70elY](http://www.youtube.com/watch?v=25Yifq70elY)

- Face aging
  - [http://www.youtube.com/watch?v=fLQtssJDMMc](http://www.youtube.com/watch?v=fLQtssJDMMc)

- Animation
  - [http://www.youtube.com/watch?v=b4kkPILdMvI](http://www.youtube.com/watch?v=b4kkPILdMvI)

- Security
What project?

- Little text-processing applications
  - identify lines above 100
  - remove line-breaks

- Add a GUI to the random sentence generator

- Automate chemistry, physics, calculus problems, etc

- Find quotes by keyword in books

- What are you currently doing that a computer could do?
What language?

• Expanding your Java knowledge with a project is valuable

• Pick a project, see what language is most appropriate
  • iOS: Objective-C
  • Android: Java
  • Client-side web: Javascript
  • Beautiful visuals: Processing
  • Quick data processing: Python
  • Embedded systems: C/C++

• Learn a new paradigm
  • Functional languages: Racket, Haskell (now, Java 8, too!)
Leveraging existing code

• Processing language
  • http://nlp.stanford.edu/software/

• Building games
  • http://lwjgl.org/

• Building games with physics
  • http://jbox2d.org/

• Processing biological data
  • http://biojava.org/wiki/Main_Page

• Accessing Facebook data
  • http://restfb.com/
Using the restFB API

• Add the restfb jar to your build path
  • In Eclipse, right click on your project > properties
  • In Java Build Path, Add JARs...

• Get an access token from the Facebook Graph API Explorer
Courses?

- **CSE non-majors**
  - CSE 154: Web Programming
  - CSE 373: Data Structures and Algorithms
  - CSE 374: Programming Concepts and Tools (C/C++, Linux, ...)
  - CSE 131: Digital Photography
  - CSE 460: Animation Capstone (open to all majors)
  - INFO, AMATH, DXARTS, ...

- **CSE majors**
  - CSE 311: (Mathematical) Foundations of Computing
  - CSE 332: Data Abstractions (Data Structures and Algorithms)
  - CSE 331: Software Design and Implementation
  - CSE 341: Programming Languages
  - CSE 344: Intro to Data Management (and databases)
  - CSE 351: Hardware/Software Interface
Weekly meetings

- Change – technologies for low-income regions
  - [http://change.washington.edu/](http://change.washington.edu/)

- Dub – human-computer interaction and design
  - [http://dub.washington.edu/](http://dub.washington.edu/)

Computer Occupations = 71% of all STEM

- Computer Occupations
- Engineers (Aerospace, Biomedical, Chemical, Civil, Electrical, Electronics, Environmental, Industrial, Materials, Mechanical, Other)
- Life Scientists (Agricultural & Food Scientists, Biological Scientists, Conservation Scientists & Foresters, Medical Scientists, Other)
- Physical Scientists (Astronomers, Physicists, Atmospheric & Space Scientists, Chemists & Materials Scientists, Environmental Scientists & Geoscientists, Other)
- Social Scientists and Related Workers (Economists, Survey Researchers, Psychologists, Sociologists, Urban & Regional Planners, Anthropologists & Archeologists, Geographers, Historians, Political Scientists, Other)
- Mathematical Science Occupations