Welcome to CompSci 201

- Data Structures and Algorithms

- Go to the class webpage
  - http://www.cs.duke.edu/courses/compsci201/fall13/wordpress/
  - Start looking around

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Welcome

- Prof. Peck

- Ben

- Reem

- An army of UTAs

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After This Class

- You will know
  - Is CompSci 201 right for me?
  - What material is covered in Compsci201
  - The course logistics
- You will be ready
  - To start coding in Java!

What is Computer Science?

- "The programmer, like the poet, works only slightly removed from pure thought-stuff. He builds his castles in the air, from air, creating by exertion of the imagination. Few media of creation are so flexible, so easy to polish and rework, so readily capable of realizing grand conceptual structures."
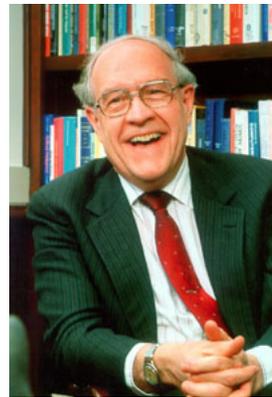
Frederick P. Brooks Jr.
Duke class of 1953

Course Material

- Toolkit – for getting a computer to solve problems
    - Efficient and elegant methods
        - Data structures and algorithms
    - Understanding tradeoffs
        - How long will this algorithm take?
        - How much space will this data structure use?

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Course Material

- Toolkit is applicable for any programming language

    - Java – you do NOT need to know Java
    - You DO need a semester of programming
    - You DO need to be willing to look up Java syntax

Java help

- Here's a page that shows Python, Matlab and the equivalent Java code. If you'd like other stuff added to this document let us know
- Here's a list of useful java functions.
- Thinking in Java by Bruce Eckel (online Java book)
- Javabat practice with basic java by writing/testing code (apt-ish, but simpler).
- javadoc for JDK 1.6 (JDK 6)

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Course Material

- Is CompSci 201 right for me?
  - Have you taken any of these, or the equivalent?
    - CompSci 101
    - Engineering 110
    - AP CompSci

  - If you are unsure, ask me after class!

Course Material

- Data Structures and Algorithms

  - Data Structures - the organization of data and its storage allocations in a computer

  - Algorithms - A process or set of rules to be followed in calculations or other problem-solving operations
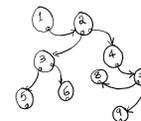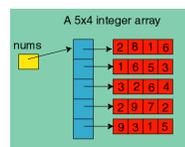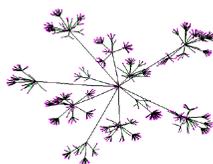
Course Material

- Analysis, use, and design of data structures and algorithms using an object-oriented language (Java) to solve computational problems.
- Emphasis on abstraction including interfaces and abstract data types for lists, trees, sets, tables/maps, and graphs.
- Implementation and evaluation of programming techniques including recursion. Intuitive and rigorous analysis of algorithms.

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Course Material

- Tradeoffs
  - How do we measure code speed?
  - How do we measure code efficiency?

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Logistics

- See the course webpage for full details!

    - http://www.cs.duke.edu/courses/compsci201/fall13/wordpress/

Course Logistics

- Textbook – Optional!
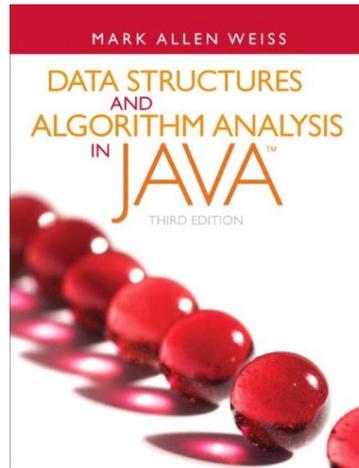
Course Logistics

- Programming assignments –   35%
- APTs –   10%
- Recitation –   10%
- Midterms –   25%
    - October 2
    - November 13
- Final –   20%
    - December 10

Course Logistics

- Programming assignments –   35%
    - Start early
    - Due at 11:59 pm on due date
    - Late submissions are late
        - 1 minute late is late

Course Logistics

- Late policy
    - You may request 2 assignment extensions
        - Link on right side of webpage
    - Extensions must be made within 24 hrs. of due date
        - Enables submission within 72 hrs. of due date without penalty

USEFUL LINKS

Sakai
Piazza
Grade errors
Assignment extensions

Course Logistics

- Late policy
  - Assignments may be submitted within 1 week of due date for ½ credit
  - Late extensions may submit within 1 week + 72 hours for ½ credit
  - Weekends and holidays count toward your 1 week / 72 hours

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Course Logistics

- Grading Policy
  - Grades will be posted in Sakai
  - Grading errors MUST be reported within 3 days of grade posting
    - weekends / holidays NOT included in 3 days
  - Report errors through the "Grade errors" form
    - Email error reports will NOT by accepted

  USEFUL LINKS

  Sakai
  Piazza
  Grade errors
  Assignment extensions

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Course Logistics

- APTs – 10%
  - Algorithmic and Problem solving Tests

  - http://www.cs.duke.edu/courses/compsci201/fall13/wordpress/?page_id=54

APT: Access Level

Problem Statement

In many computer systems and networks, different users are granted different levels of access to different resources. In this case, you are given a int[] rights, indicating the privilege level of each user to use some system resource. You are also given a int minPermission, which is the minimum permission a user must have to use this resource.

You are to return a String indicating which users can and cannot access this resource. Each character in the return value corresponds to the element of users with the same index. 'A' indicates the user is allowed access, while 'D' indicates the user is denied access.

Class

```
public class AccessLevel {
    public String canAccess(int[] rights, int minPermission) {
        // fill in code here
    }
}
```

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Course Logistics

- Recitation
  - Weekly review and practice of course material
  - There is an assignment due this Friday!!!!
  - Fridays
    - Attendance required
    - Work due at end of recitation for full credit
    - Must be submitted within 1 week for half credit
    - 1 late submission granted w/o penalty
      - You do not need to complete any forms

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Course Logistics

- Honor Code
  - Don't cheat
  - Write your own code
  - Acknowledge help
  - Don't cheat

Important dates

- Exam 1 – October 2
- Exam 2 – November 13
- Final – December 10

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Programming Languages

C++ "Hello World"

```
#include <iostream.h>
main()
{
cout << "Hello World! ";
}
return 0
```

Programming Languages

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```

Java "Hello World"

```
class HelloWorldApp
  {
    public static void main(String[] args)
      {
        System.out.println("Hello World!");
      }
  }
```

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Programming Languages

C++ "Hello World"

```
#include <iostream.h>
main()
{
cout << "Hello World! ";
}
return 0
```

Java "Hello World"

```
class HelloWorldApp
  {
    public static void main(String[] args)
      {
        System.out.println("Hello World!");
      }
  }
```

Python

```
print "Hello world"
```

Matlab
disp('Hello World');
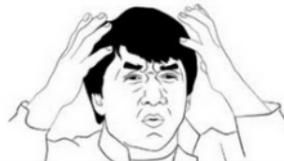
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Code

```
class Example{


  public static void main(String[]
  args){


      System.out.println("Hello 201");


  }

}
```

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Code

Name of your class (Starts with a capital letter)

```
class Example{


  public static void main(String[]
  args){


      System.out.println("Hello 201");


  }

}
```

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Code

Name of your class (Starts with a capital letter)

```
class Example{
```
Tell computer where to start running your program

```
  public static void main(String[]
  args){

      System.out.println("Hello 201");

  }

}
```

Code

Name of your class (Starts with a capital letter)

```
class Example{
```
Tell computer where to start running your program

```
  public static void main(String[]
  args){

      System.out.println("Hello 201");

  }

}
```

Print to the terminal

This is what you are printing

Homework

- Recitation assignment due BEFORE recitation on Friday
  - Setup and start coding in Java
  - Helpful for Wednesday
- Next class
  - Java programming
  - APTs

- Is compSci 201 right for you?
  - Come see me if you are unsure

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