

CS1 Chrestomathics

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Tag Workshop Organizers Meeting
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And in conclusion

- CS 1X - an introductory CS course targeted for students without prior experience
- Attractive to under-represented groups
- More likely to choose computing
- Attraction comparable to demographics up to comparable levels
- Only one student has not persisted to graduation



Starting point



CS 1X

- Designed to encourage education, interest, and retention of a diverse community
- Starts with preregistration: students must meet with me - we make promises to each other

Look into my eyes

CS is darkness. Programs, Java, work.
If I squint, I still can't see. Combined both inside and out.
Class will be my light. In my head lurks doubt.

Computer science. Computers work me.
Will teach me how to use the Devil box this spring. But after this course,
I work computers.

Look into my eyes

Writing a poem. Programming seems hard.
For my new computer class. I've never tried it before.
This is an odd start. I hope I

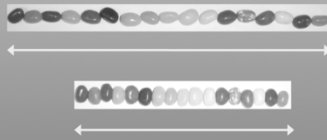
On my computer. Befuddled blonde brain.
I will write me a program. Computer caused confusion.
That will change the world. Programming paranoid

Getting a taste of computational thinking

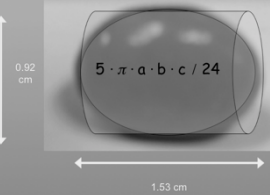


Problem solving

Jelly Beans



Jelly Beans



Jelly Beans



$$\frac{d \cdot e}{5 \cdot \pi \cdot a \cdot b \cdot c / 24}$$

BeanCount.java

```
import java.util.*;

public class BeanCount {
    public static void main( String[] args ) {
        Scanner stdin = new Scanner( System.in );

        System.out.println("Enter jelly bean length (cm): ");
        double a = stdin.nextDouble();
        System.out.println("Enter jelly bean width (cm): ");
        double b = stdin.nextDouble();
        System.out.println("Enter jelly bean height (cm): ");
        double c = stdin.nextDouble();
        System.out.println("Enter jelly bean loading factor (%): ");
        double loading = stdin.nextDouble();
        System.out.println("Enter jar size (ml): ");
        double jar = stdin.nextDouble();

        int count = (int) ( jar * loading / ( 5 * Math.PI * a * b * c / 24 ) );
        System.out.println("beans: " + count);
    }
}
```

Situation



From there to here

Our situation - the curious course CS 1

- Required course for all 1st year engineering students
 - Introduction to programming
 - First course in a BS computing degree
 - Weekly closed laboratory
- Contrary to national trends course enrollment is increasing - up 25% over the last 7 years
- Improved CS 1 experience



CS 1E

- Specification
 - Provide comparable computing content
 - Common assignments, tests, and grading
 - Open laboratories
- Result
 - Better overall CS 1 environment
 - Contributes to enrollments and helps with diversity
 - By itself not a magic bullet



CS 1 multiple entry points

- CS 1
 - Open to all
- CS 1E
 - Open to people with experience



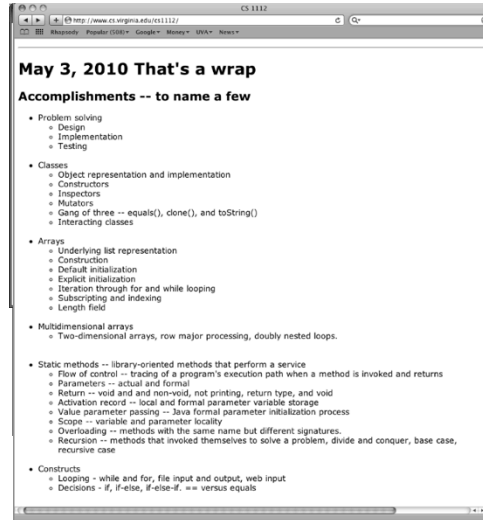
CS 1X - founding principles

- We can do better
- Meet same knowledge and experience goals as other sections
- Offer different means and practices to encourage the education, interest, and retention of a diverse community
 - Frequent demographics
 - 50% Female
 - 12% African-American
 - 8% Hispanic



What's it all about

- Guided discovery
- Active and collaborative learning
- Class culture of success
- Encouraging pedagogy and examples
- Constant recruiting
- Integrated lecture and laboratory - instructor and TAs all the time
- Regular acknowledgement



Raised consciousness

Take away

- CS 1X a course targeted for students without prior experience using
 - Guided discovery with active learning
 - Integrated computer availability
 - Motivating examples with broad appeal
 - Routine discussions of options advantages, and rewards of computing careers
 - Establishment of a cohesive, ongoing culture

Produced

- Significant additional interest in computing among the students
- Attracted other students to take the course



Give away

- How do you maintain a positive class environment?
- What would you like to change in your intro to CS course?
- What about your course should others adopt?
- What should you change, but will not?