CSE 142
Computer Programming I
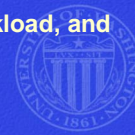
Overview and Welcome

Richard Anderson and Martin Dickey
Autumn Quarter 2000
Slides based on those of Martin Dickey
and John Zahorjan, Winter 2000, and
previous quarters.
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Today's Outline

Computers and Software

Programs, languages, and problem solving

Should you be here?

Course organization, workload, and grading

Resources
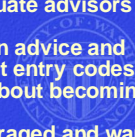
First Assignment

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Can't get in?

Some new spaces will open up this week!
History shows that many students drop 142
during the first two weeks of the course
All you can do is keep trying
- No waiting list, no lottery
- Matriculated undergrads have priority over grads and non-matriculated students

Instructors do not have entry codes

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What to do until then...

You are welcome to attend this week and do the first assignments, but… we cannot guarantee you will get in.
Go to some quiz section on Thursday
CSE (the Computer Science and Engineering Department) has undergraduate advisors in Sieg 114.
- See them for all registration advice and signatures   (but not entry codes)
- See them for information about becoming a major
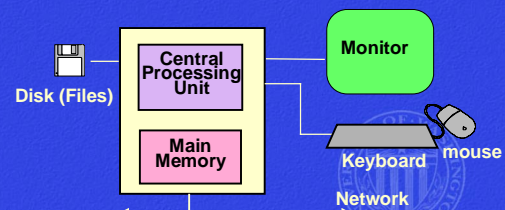- See them if you get discouraged and want to drop

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What is a Computer?
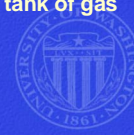

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Computers in the 60's

As big as a truckload of bricks

Weighed as much as a truckload of bricks

Cost as much as a truckload of gold bricks

Today: "better ones in toys and toasters"

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## If Cars Had Improved Like Computers...

A Cadillac would cost $0.50

Do 0 to 60 in 3 milliseconds

Go to the Moon and back on a tank of gas

Fit in your pocket

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Is The Revolution Over?

Moore's law: # of transistors per chip doubles every 18 months.

Intel Pentium II had 7.5 million transistors

Intel Pentium III has 28 million transistors

100-500 million transistors per chip easily foreseeable

Much faster clock speeds, throughput in the future

Advances also in memory, magnetic (disk) and optical (CD) storage, networking, etc.

Yet prices aren't rising!
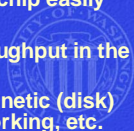
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What about software?

Major software-based products literally unimaginable 10 - 15 years ago

 desktop publishing, Internet browsers, 3-D games, Web audio and video, e-commerce

Big improvements in

 handwriting and speech recognition

 computer animation, graphics, vision

 digital consumer products

  cell phones, CD-ROM and DVD, etc.

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Why Are We Here Today?

Computers are changing the way *everything* is done

Computers will continue to change our lives

Programming is a key enabling technology

That's the Big Picture.

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What Is a Program?

A **program** is a set of instructions that the computer is supposed to execute to solve some problem.

Computers are **general purpose** devices.

I.e., just about **useless** (without a program)

A program transforms a computer into a **special-purpose** device, capable of solving a specific problem.

Footnote: "software" = programs

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Languages

Computer hardware (a "machine") carries out instructions written in a **machine language**

1's and 0's – very hard for people to understand

A **high level language** is a notation that humans can understand and use more easily

A **compiler** translates a high level language to a machine language that can be executed

Machine Language - 1940's
Fortran, Lisp - 1950's
Cobol, Algol, APL, PL/I - 1960's
Basic, Pascal, C - 1970's
Smalltalk, C++, Modula, Ada, Prolog - 1980's
Java 1990's

CSE/ENGR 142
Computer Programming I

UW Catalog Description:

Basic programming-in-the-small abilities and concepts. Highlights include procedural and functional abstraction with simple built-in data type manipulation. Basic abilities of writing, executing and debugging programs.

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What is Programming Like?

It's really hard to describe!

Many similarities to solving "word problems" in math

Translate a problem description into a formal solution

Symbol manipulation an integral part

Some people describe it as "puzzle solving"

A mix of high-level creativity and low-level picky details

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Problem Solving and Program Design

Clearly **specify** the problem
Analyze the problem
Design an **algorithm** to solve the problem
Implement the algorithm (write the program)

Documentation essential

Test and verify the completed program

The test-debug cycle

Maintain and update the program

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Why Are You Here?

"I know computing is important, and I need basic expertise."

"I'm just curious."

"I have this computer and I want to do X but I can't get software that does X."

"It's a requirement for my major."

"I want a career in computing."

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Should you be here??

If you already know the contents of this course and C...

You **can** go directly to CSE 143 (142 credit available if you do well in 143)

Go there *today* to check it out: Guggenheim 224, 2:30 pm MWF

This course may be boring but will still be time-consuming. You'll have to do things "our way."

If you stay, please participate!

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Should you be here??

If you are a complete novice to programming...

Prior programming experience is NOT required!

But...programming a computer is very different from simply using one.

Being comfortable or even expert with computer applications is not the same as programming!

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Course Organization

Lectures 3 times a week

Quiz section once a week

Programming projects
   In the lab or at home (with proper equipment)
   Individual effort (not group projects)
   Normally, Sunday night electronic turnin deadline, with paper copy due Monday

Two midterm exams

Final exam – Tuesday, Dec. 12, 2000
   May be a time change from original schedule!

Other activities: non-programming HW, quizzes

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Quiz Section

Quiz section: once a week
   Review, questions, exercises, quizzes and more

Designated sections
   "low-background": for students without previous programming experience
   "high-background": for students with considerable experience
   All sections have identical assignments, tests, and grading criteria

Can request section swap in Wed. lecture

Please memorize your student ID#, quiz section ID and your TA's name!

Final Exam (Comprehensive)

Tuesday, December 12, 2000
Times and rooms, but not the day, are likely to be different from the on-line Time Schedule (will be announced when we know the details)
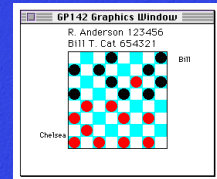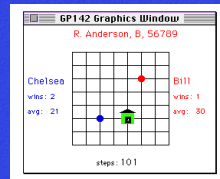With permission you can move to the exam period other than the one you are scheduled for. If you have a problem with <u>both</u> times contact course administrator as soon as times are announced.
It will not be possible to take the final on any other day.

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Homework Can Be Fun

Examples from previous quarters…

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What To Expect

Grades:
- Class average just below 3.0
- Always some 4.0's, always some 0.0's

Is this a tough course?
- Contents are challenging
- Projects can be time-consuming
- Cramming won't work -- must keep up

Fun?
- Absolutely!

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The UW Drop Policy

Historically, 10%-15% of CSE/ENGR 142 enrollees dropped the course
- Most drops were after the 10th day under the old drop policy

It's very hard to judge how challenging this course is by its first two weeks

Unfortunately, you must drop by 10th day !
- Once per year you get a "free" drop.
- Also possible to change status to noncredit until week 7 of the quarter.

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Advice

Keep up with the course day-by-day

Seek help early and often:
- TA, instructor office hours
- Lab consultants (IPL)
- Undergrad advisors in Sieg 114
  - Some special tutoring is available

Consider joining a "low-background" section if you're new to programming

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Course Staff

Here to help you succeed!

Instructors
- You can go to either instructor's office hours

TA's
- Teach sections & grade homework
- You can go to any TA's office hours

Lab staff
- Operator (front-desk)
- 142 Consultants

Course administrator: Special arrangements, fix bookkeeping problems, claim abandoned work, etc.

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Textbook and materials

Text: "*Problem Solving and Program Design in C*" - Hanly and Koffman
- 3rd edition (2nd edition ok with minor adjustments)
- "self-check" and "quick-check" exercises highly recommended (answers in book)

Course Packets
- Slides (based on last quarter's), reference material
  - Many students bring this to every lecture to take notes (recommended)
- Buy at: Professional Copy & Print, 4200 U. Way

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CSE142 Web Site

http://www.cs.washington.edu/education/courses/142

- Messages from class mailing list (read often)
- Homework projects
  - Instructions
  - Downloading
  - Turn-in
- Lecture schedule and current reading
- Lecture slides
- Tips, hints
- Office hours
- Exam information, lab schedules, etc. etc.

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Mailing Lists & Newsgroups

Announcements, tips, hints, place to ask questions and get answers
uwash.class.cse142.* newsgroups for general discussions
"cse142-announce" mailing list for announcements from course staff
- Must subscribe first
  - send mail to: majordomo@cs.washington.edu
  - message text exactly as follows:
    - **subscribe cse142-announce**
- Details on the Web

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IPL: Intro Programming Lab

- New lab in MGH, Au00
- Pentium PC's running Windows
  - Microsoft Visual C++ Version 6.0
  - Web browsers
  - Electronic mail
- CSE142 consultants (posted hours)
- **Visit today!**

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If you compute at home...

- Stay connected with Web and e-mail
- Get a compiler - MSVC++ 6.0 recommended
  - UW Bookstore has the "Standard" edition for <$50.
- Windows 95/98/NT/2000+MSVC is our "official" platform
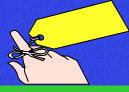 - some support for others
- Do first project in IPL
  - just to become familiar with it
- Help on computing at home is on 142 web site
- Expect a few headaches (but worth it!)

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Tutorials

Optional tutorials, this week
Hands-on sessions in the IPL to get you familiar with the system

- Windows 95/98/NT, Web browser, basic MSVC, ...
  - Meant for people unfamiliar with the software
    - No advanced stuff
  - Can do assign. 0 (esp. part B) during tutorial
  - Seating: 1st come, 1st served
  - Length: about 1 hour

Location: IPL, MGH
Time: TBA (check the Web)

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Homework # 0

Due in 2 parts: This Friday(!) and Sunday/Monday

Read Chapter 1 and handouts.

Go to IPL (Sieg 323) and start learning the system. Be sure and read section 1.2 before going to lab.

Start playing with the other software tools.

There's lots to read during the quarter: Start going & keep going!

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