Welcome to CSci 1113

Introduction to C/C++ Programming for Scientists and Engineers
Instructor (me)

James Parker
Lind 354

Primary contact:
jparker@cs.umn.edu
TAs

Zhiheng Deng, Jangyoon Kim, Apurva Badithela, Thomas Crumrine, Abdelrahman Elfaramawy, Allie Funk, Jon Garbe, Reid Kleinschmidt, James Kolar, Justin Koo, Nikki Kylloinen, Christian Loven, Max Marchionda, Timothy Nelson, Joseph Rice, Reed Schelitzche, Gaurav Singh, Liam Tyler, Mina Yacoup, Laura Ziegelski
Questions?

Direct questions to:
csci1113@cs.umn.edu
Moodle forum discussion
Problem Solving With C++, Walter Savitch, 9th edition
CSE Labs account

You need a CSE Labs account to participate in labs in this course.

Lab attendance is mandatory (please make an account!)
The College of Science and Engineering maintains several public computer labs that are reserved for CSE students. Students must open a CSE labs account in order to use these labs.

This site provides information regarding CSE lab account creation, access, and use. If you are unable to find what you are looking for on this site or have comments, suggestions, or questions, please send e-mail to operator@cselabs.umn.edu.

Door Access: The Mechanical Engineering building now has 24 hour access for CSE Labs students. If you have an active CSE Labs account your U Card will now have access to the NSE building after hours. If you would like to test your U Card to ensure it works, please use the door in the far southwest corner of the courtyard between the old Mechanical Engineering building and the new Mechanical Engineering building. This is NOT the glass door next to the elevator.

Quick links for new students
- Account Information
- Account Authorization form
- Classroom and Lab Information
- Lab Locations
- Lab Hours
- Welcome to CSE Labs
- Account Information
- ClassroomLab Information
- Course Websites
- Software
- Help Pages
- Directions and Contact
http://cselabs.umn.edu

CSE Public Computer Classrooms and Labs

Account Information

The College of Science and Engineering provides and maintains publicly accessible computing labs in support of education, work, and limited research (see Usage Policies) for its faculty, staff, and students.

Eligibility

CSE Labs accounts are available to:

- All students who are currently enrolled in the College of Science and Engineering
- Faculty in the College (email operator at operator@cselabs.umn.edu - we will open one for you.)
- Students taking courses within the college that require CSE Labs access

Account Creation

CSE Labs use is open to any student currently enrolled in the College of Science and Engineering.

You can open a CSE Labs Account using one of the following two processes:

- Online: You can open an account online by completing the CSE Labs Account Creation Form.
- Labs: You can also open an CSE Labs account by visiting one of the CSE Labs. Enter on the counter for the username, and "register" for the password, to log into one of the workstations. Once you have logged in, complete the Account Creation Form that is presented.

Acceptable Use Policies
CSE Labs Account Creation

CSE Labs accounts no longer closing every term
If you have had a previous CSE Labs account, you do not need to reopen it every term. Accounts will now only be closed after a year of inactivity.

Welcome to the CSE Labs Account Creation Site
Use this site to initiate your CSE Labs account. CSE Labs use is open to any student currently enrolled in the College of Science and Engineering.

If you do not know what your username is, or you are having problems see the U of M Student Internet Account Initiation Form.

Create CSE Labs Account

For further information send email to operator@cselabs.umn.edu or stop by the Systems Staff Office in Keller Hall 1-201.

For a list of our hours see Systems Staff Contact Information and Hours.

Changing your Password
If you want to change your password, you will need to use the U of M Internet Account Options web page.
Welcome to the Fall2012 CSE Labs Account Creation Form.

Use this form to initiate or change your CSE Labs account for the Fall2012 semester. CSE Labs use is open to any student currently enrolled in the College of Science and Engineering.

Please enter the following information:

- Your student email username.
- Your password for your general UMN email account. (To verify your eligibility for a CSE Labs account.)

Username: park0580@umn.edu
Password: ************

If you do not know what your username is, or you are having problems see the U of M Student Internet Account Initiation Form.

For further information send email to operator@cselabs.umn.edu or stop by the Systems Staff Office in Keller Hall 1-213.

For a list of our hours see Systems Staff Contact Information and Hours.

Submit
CSE Labs account

CSE Labs account used in lab (first lab ensures account working)

Register ASAP

Problems?
Bug operator@cselabs.umn.edu
Class website

www.cs.umn.edu/academics/classes
Or google “umn.edu csci class”

Syllabus, schedule, other goodies

Moodle page will have grades and homework submissions
Class website

Moodle also has a link to the website:

Office Hours

1113 Office Hours

<table>
<thead>
<tr>
<th></th>
<th>Sun 1/15</th>
<th>Mon 1/16</th>
<th>Tue 1/17</th>
<th>Wed 1/19</th>
<th>Thu 1/19</th>
<th>Fri 1/20</th>
<th>Sat 1/21</th>
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<tbody>
<tr>
<td>6am</td>
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CSci 1113: C++ Programming

Schedule*

This is an approximate schedule. It will be updated as the class progresses.

<table>
<thead>
<tr>
<th>Week Of</th>
<th>Topics</th>
<th>Lecture Materials (001)</th>
<th>Lecture Materials (020)</th>
<th>Readings</th>
<th>Exams</th>
<th>Lab</th>
<th>Due</th>
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<tbody>
<tr>
<td>Jan. 16</td>
<td>Introduction, computers, algorithms, programs, compilers</td>
<td></td>
<td></td>
<td>Ch. 1</td>
<td></td>
<td>Unix tutorial</td>
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<tr>
<td>Jan. 23</td>
<td>Variables, expressions, assignment, console I/O, predefined functions</td>
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<td></td>
<td>Ch. 2, Section 4.2</td>
<td></td>
<td>Lab 1: Basic C++ programs</td>
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<tr>
<td>Jan. 30</td>
<td>Selection, boolean expressions, if-else, multiway-if, switch</td>
<td></td>
<td></td>
<td>Sections 3.1, 3.2</td>
<td></td>
<td>Lab 2: Sequence and selection</td>
<td>HW 0, Friday Feb. 3 at 9:00 P.M.</td>
</tr>
</tbody>
</table>
15% Labs
30% Homework (due Fridays)
  5% Quiz (Feb. 14)
10% Midterm 1 (Feb. 28)
15% Midterm 2 (April 11)
25% Final (May 9, 6:30-8:30pm)
Syllabus

Each week there will be either a homework due or a test

Homework is due Fridays at 9:00 P.M. on Moodle

Late homework is not accepted, but we will drop the lowest one
Labs can be checked off up until a week after the lab

Homework must be coded individually

Don't cheat
Really... don't cheat
Homework

Homework will be both a creative and problem solving endeavor:

Lego example
Build a castle with:
-4 walls enclosing
-Door
-At least one tower (higher than wall)
Homework
## Syllabus

<table>
<thead>
<tr>
<th>Grading scale:</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>93% A</td>
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<tr>
<td>90% A-</td>
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<tr>
<td>87% B+</td>
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<td>60% D</td>
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<td>Below F</td>
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Schedule

Ch. 1: Introduction, Programs, Compilers
Ch. 2: Input/Output, Data, Expressions
Ch. 3: Control Flow (if and loops)
Ch. 4, 5: Functions (return values)
Ch. 6: File I/O
Ch. 7, 8: Arrays and Strings
Ch. 9: Pointers and Dynamic Arrays
Ch. 10&11: Classes and Operator Overloading
Ch. 14&15: Recursion & Inheritance
Syllabus

Any questions?
What can I program?

If you can think of an explicit process (of simple steps) to solve your problem, then it can be programmed.
Banana Nut Bread

Directions
1. Preheat the oven to 350°F (175°C).
2. Mix butter into the mashed bananas in a large mixing bowl.
3. Mix in the sugar, egg, and vanilla.
4. Sprinkle the baking soda and salt over the mixture and mix in.
5. Add the flour and nuts last, mix.
6. Pour mixture into a buttered 4x8 inch loaf pan.
Repetitive tasks

Simply move the blue ball with your mouse and avoid the red balls. Easy? Definitely not!
ATMs

How do you get change for $18.26 with the least amount of bills and coins?
Repetitive tasks

If you feel like a mindless zombie when you do it a lot, you can probably program it.
Repetitive tasks
Repetitive tasks
Auto leveling?
Software vs Hardware

Software - the more intangible code on a computer

Hardware - the physical Parts of the computer
Hardware interaction

Input → CPU → Memory → Output
Memory addressing

Data is stored in “addresses” inside the memory

Later in this class, we will use these addresses to manipulate and share data
Memory addressing
Object oriented programming

OOP - focus on data and how they interact

To make algorithms for OOP, it is often useful to identify the data you are working with and their relationships before programming
Object oriented programming

Data for...

Banana nut bread?
ATM?
Ball game?
Object oriented programming

Data for...

Banana nut bread? Ingredients
ATM?
Ball game?
Object oriented programming

Data for...

Banana nut bread?  Ingredients
ATM?  Dollars & coins
Ball game?
Object oriented programming

Data for...

Banana nut bread? Ingredients
ATM? Dollars & coins
Ball game? Balls & mouse
Object oriented programming

Data for...

Banana nut bread?  Ingredients
ATM?  Dollars & coins
Ball game?  Balls & mouse

Lots of pixels (tiny color dots)