Welcome

CS135 Lecture 00

Introduction to Course Personnel

Your instructor: Charlie Clarke, MC5226, *claclark*@uwaterloo.ca

ISC (Instructional Support Coordinator): Karen Anderson

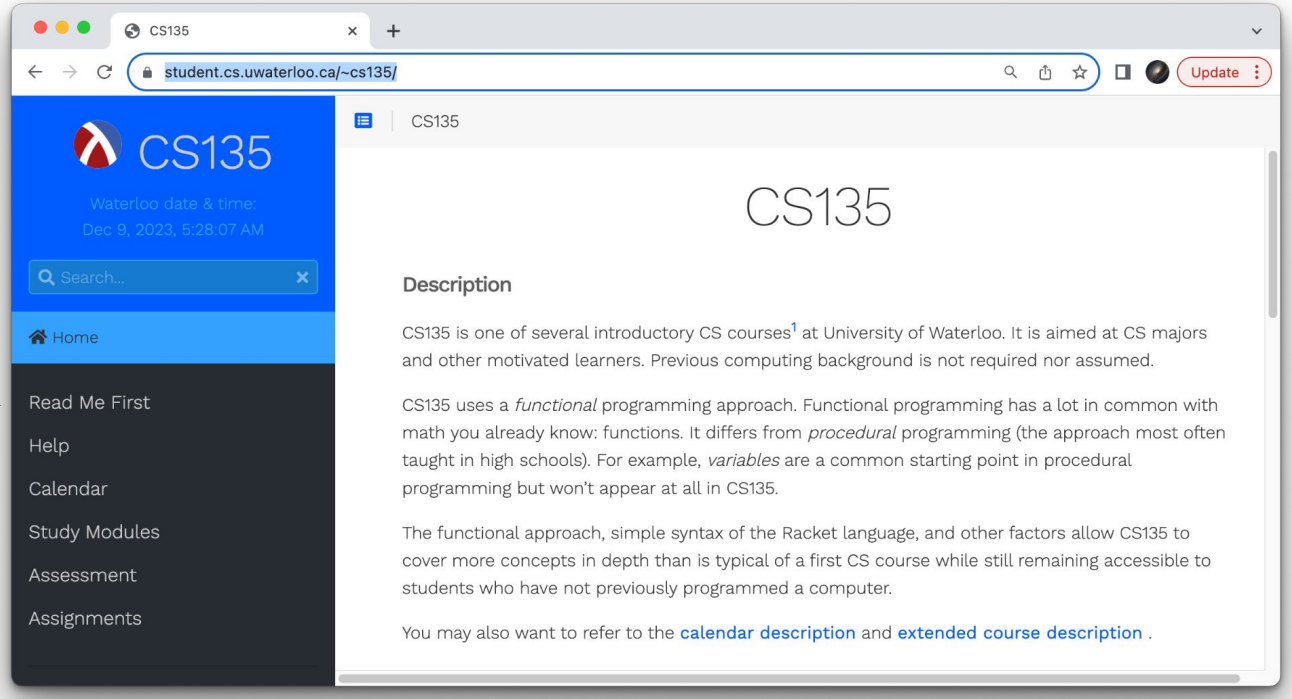
- The ISC handles course administration, including student illnesses and absences

Other course personnel (see website for details):

- IAs (Instructional Apprentice)
- ISA (Instructional Support Assistants)
- TAs (Teaching Assistants)

Web site (main information source): **`https://student.cs.uwaterloo.ca/~cs135`**

https://student.cs.uwaterloo.ca/~cs135



Read me first

CS135: Designing Functional Programs

Your phone, laptop, desktop, etc. all contain one or more computers.

In this first Computer Science course, we don't just study computers or computer programming, we study computation itself. We take the first steps in an exploration of the fundamental properties and limitations about what can be computed, how it is computed, and how fast it can be computed. This exploration will be continued in later Computer Science courses.

The earliest computers, the computer in your watch, and the fastest gaming GPU all share the same fundamental properties and limitations.

To study computation, we will use a simple, mathematically oriented functional programming model of computation, whose roots predate modern computers.

The “Red Room” in the MC Building, 1967-1999

https://ist.uwaterloo.ca/cs/redroom

Artificial Intelligence at UWaterloo

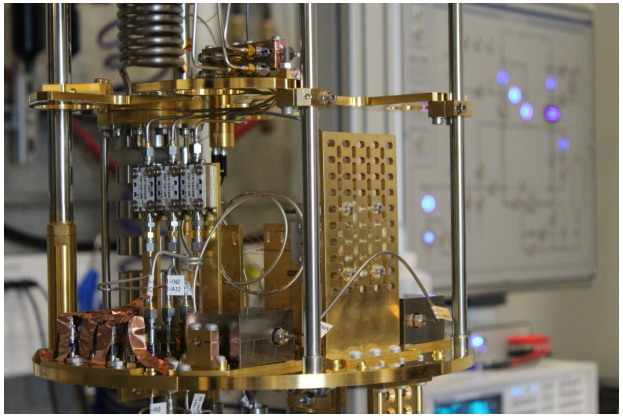
https://uwaterloo.ca/artificial-intelligence-institute

Quantum computing at UWaterloo

POINTING UP = 0

POINTING DOWN = 1

INSTITUTE FOR QUANTUM COMPUTING



https://uwaterloo.ca/institute-for-quantum-computing

Course Delivery

Lectures: Instructors present the core course material. Slides are available on the web site along with other supporting material. Lectures will include "clicker questions" to help you assess your understanding. Participation marks from these clicker questions form part of your course grade.

Tutorials: Course staff will work through problems that are similar to core material on the upcoming assignment. They will "think aloud" to show their thought processes and demonstrate how to apply our design pattern to help solve these problems.

Office Hours: Instructors and other course staff hold regular office hours, both online and offline, in which you can receive more individualized help. You may attend any office hour held by any instructor or staff member (not just your own instructor).

Piazza: A discussion forum for questions and messages to the class.

Assignments: Individual work to demonstrate what you've learned and receive feedback.

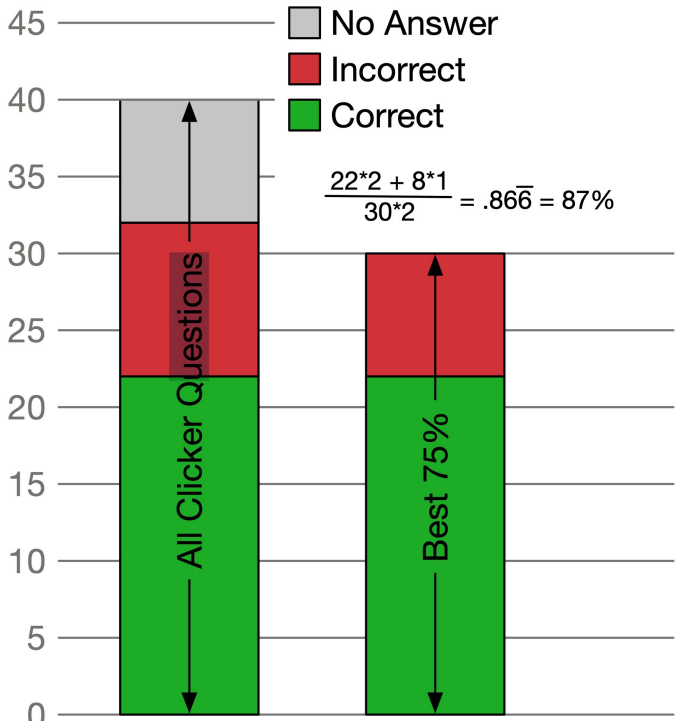
Exams: An opportunity for us to assess what you've learned.

Participation marks from clicker questions

Clicker questions encourage active learning and give you immediate feedback on your understanding.You respond to clicker questions using iClicker Cloud web or phone app. After all responses are collected, we look at the results and discuss.

Register at https://student.iclicker.com.

Marking: two marks for the correct answer; one mark for any other answer. We take the best 75% across the entire term to calculate 5% of your final mark. We take the best 75% to account for co-op interviews, sick days, etc.



Tutorials

- Held on Fridays in smaller groups than lectures.
- Led by an IA (Instructional Apprentice) or ISA (Instructional Support Assistant).
- Work through one or two complete examples in more detail.
- We "think aloud" while solving problems to show the complete process.
- Problems are not published. Often similar to the upcoming assignment problems. Lots of opportunities for questions.
- Bring your laptop.
- **You should definitely attend if your assignment marks are less than 80%.**

Assignments

Timing: 9 assignments, due Tuesday at 9:00pm.

Software: DrRacket v8.14 (`https://racket-lang.org`)

Computer labs: MC 2062, 2063, 3005, 3027. Available for your use, but not scheduled labs. Most students use their own computers.

A00: Due soon. Must complete before the due date for Assignment 01 to receive marks for Assignment 01.

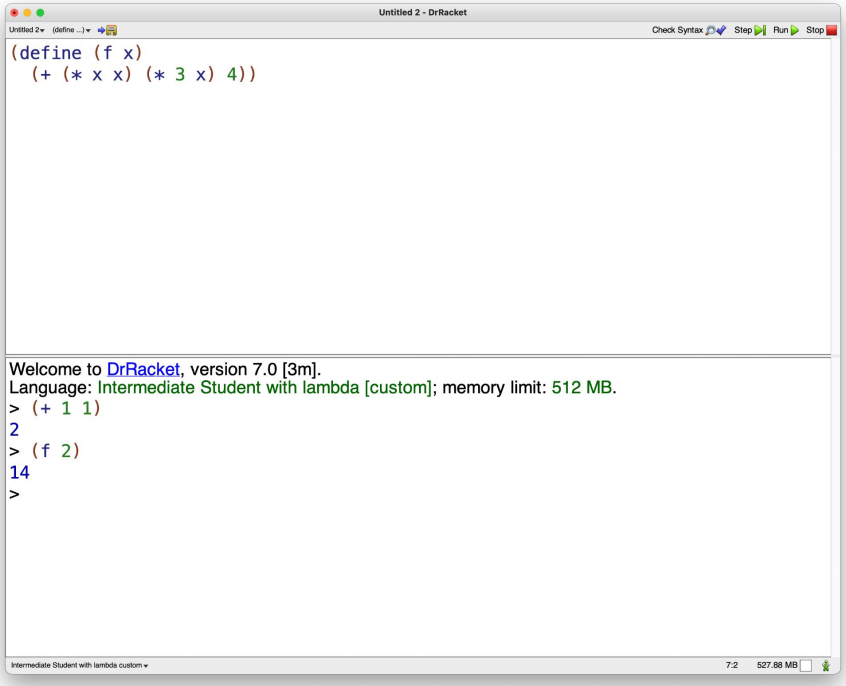
Submission: To the MarkUs system. More in A00. Submit early; submit often. Four "slip days", which include allowance for short-term absences.

Email submissions will not be accepted. (Really. We mean it.)

The DrRacket Programming Environment

- Supports Racket, a version of the Scheme programing language designed for education
- Provides a sequence of language levels
- Two panes:
  - Definitions (top) used for writing programs
  - Interactions (bottom) used for testing, experimenting

Under the language settings, select Choose Language…

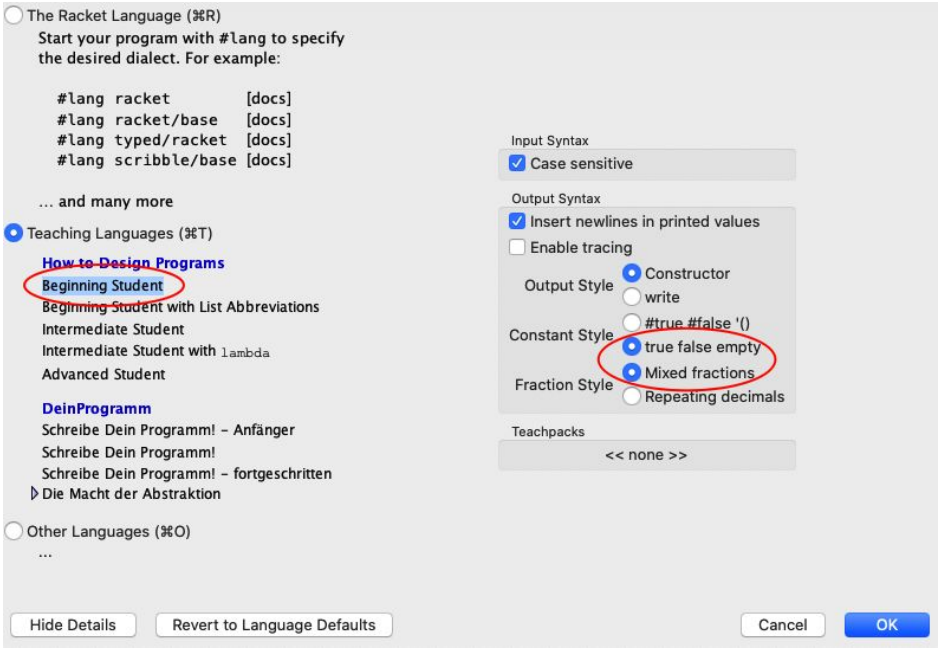


Language settings in DrRacket

CS135 will progress through the Teaching Languages starting with Beginning Student.

Follow these steps each time we change the language:

1. Under the Language settings, select Choose Language…
2. Select Beginning Student under Teaching Languages
3. Click the Show Details button in the bottom left
4. Under Constant Style, select true false empty
5. Under Fraction Style, select Mixed fractions



Assignments are individual work

You can talk to other students about:

- General course concepts
- Examples from class or tutorial
- Assignments problems one week **after** the due date (to allow for slip days)

You may not share with other students any material you have written for current assignment problems, nor read any material they have written. You may not seek answers to specific problems on the Web, through any homework help service, or using AI tools, such as ChatGPT. In later assignments we may provide material you can use, but otherwise assignment solutions must be entirely your own work.

If you need help, we hold regular and frequent office hours, both online and offline.

Exams

Midterm exam: March 3 at 19:00, 110 minutes in length

Final exam: Date to be determined by the Registrar, 2.5 hours in length.

The course was re-structured for Winter 2025 (this term) and **old exams may no longer fully reflect the current version**.

Marking scheme

Participation marks: 10%

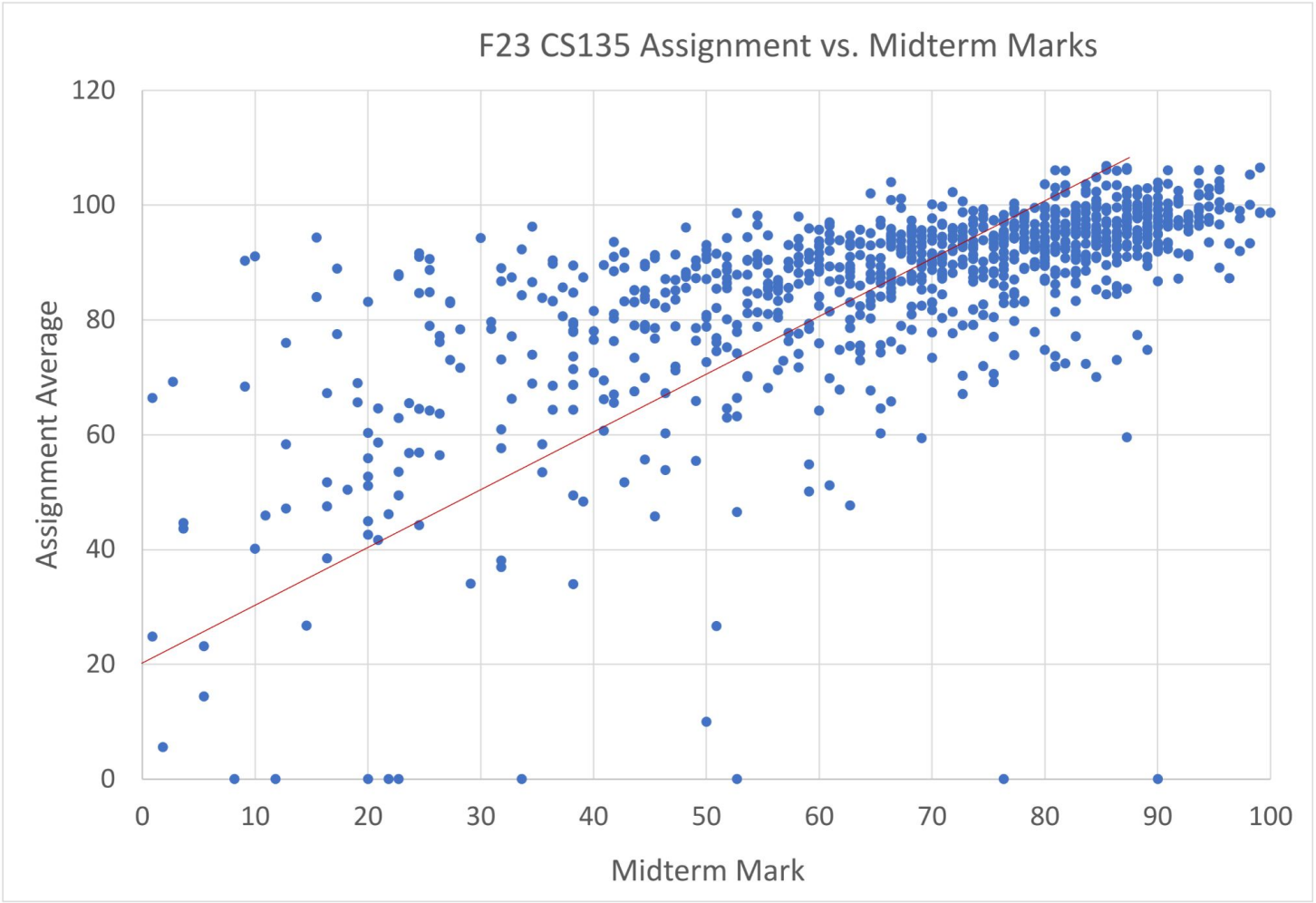
Assignments: 20%

Midterm exam: 25%

Final exam: 45%

To pass the course you must:

- earn at least half the available assignment points (10% out of 20%), **and**
- earn at least half of the available exam points (35% out of 70%).


F23 CS135 Assignment vs. Midterm Marks
Assignment Average
Midterm Mark
0
20
40
60
80
100
120
0
10
20
30
40
50
60
70
80
90
100

Communicating with us

- Ask questions in class – many questions are relevant to the whole class.
- Talk to your instructor after class.
- Instructors and ISAs hold office hours throughout the week.
  - In person and online via MS Teams
  - Times posted at: CS135 > Help > Office and Consulting Hours
  - Instructions for MS Teams at: CS135 > Help > Using Microsoft Teams
- We use Piazza for online discussion and Q&A:
  - Use meaningful subjects (not just “A3 problem"; what’s your specific problem?).
  - Search previous posts before posting; Don’t duplicate!.
  - Possible to post privately if necessary.
- Read your mail sent to your UW email account. We will only send to and reply to your UW email account. We do not respond to non-UW email addresses.

Copyright and intellectual property

The teaching material used in CS135 is the property of its creators, including:

- These course slides
- Assignment questions and solutions
- Exam papers and solutions

Do not share or post course material, especially assignment and exam material, on external websites, social media, chat groups and similar places.

Suggestions for success

- Read the CS135 ~~Survival~~Thrival Guide as soon as possible.
- Keep up with your assignments. Start them early. **This is key!**
- Go over your assignments and assessments; learn from your mistakes.
- Visit office hours as needed; earlier is better.
- Follow our advice on approaches to writing programs.
- Integrate exam study into your weekly routine.
- Maintain a “big picture” perspective: look beyond the immediate task or topic.

What happens next?

Over four lectures we will develop our model of computation:

1. Values and expressions
2. Functions
3. Conditional expressions
4. Recursion

After the final step, we will have built a complete “computer”, essentially from math.

We will then add “lists” to our model of computation to simplify data organization.

We will then explore a variety of basic algorithms and data structures using lists.

What to do next?

- Register your iClicker (`https://student.iclicker.com`)
- Download DrRacket (`https://racket-lang.org`)
  - Set language level
  - Try `(+ 1 1)` in interactions pane
  - Try `(+ 1 1)` in the definitions pane (don't forget to hit "Run" in the top right)
  - Try saving and restoring your work in the definitions panel
- Complete Assignment #0 (A00)