Welcome to

CSI 3120
Programming Languages Concepts

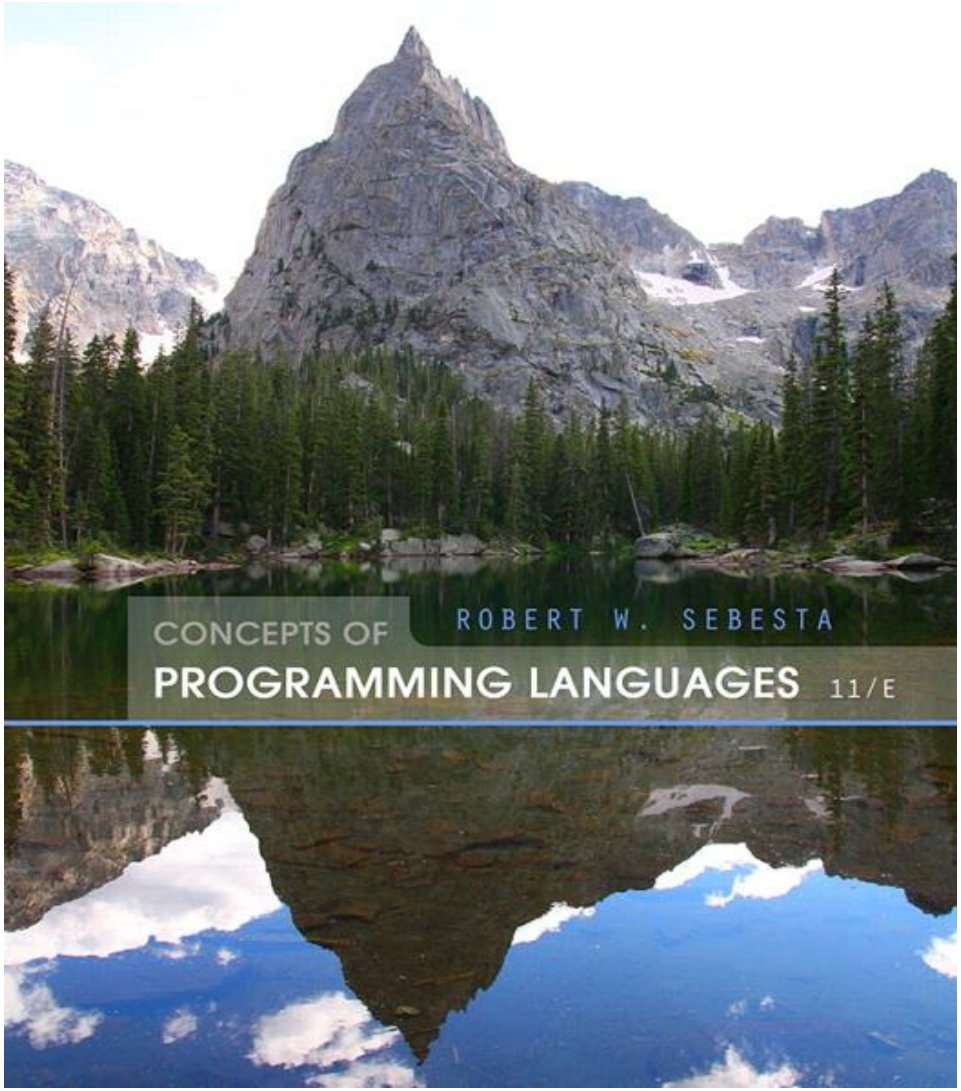
Contact information

- Lecturer: Rafael Falcon
- Office: STE 5000J
- Office hours: Mondays 10:00 - 11:15 am
- Phone: 613 244 8916 x214
- Email: rfalcon@uottawa.ca
- My Web site: http://www.site.uottawa.ca/~rfalc032/

TAs

- **Akhil Kumar**
  - akuma061@uottawa.ca
  - Office hours: Wednesdays, 10am – 11:30am
  - Location: STE 5000J
- **Ahmer Bashir**
  - abash033@uottawa.ca
  - Office hours: Fridays, 4:00pm - 5:30pm
  - Location: STE 5000J

Textbook



Robert W. Sebesta

Concepts of Programming Languages, 11th ed.,

Addison-Wesley, 2015

(University Bookstore)

Prerequisites

- **CSI 2101 Discrete Structures**
  - predicate logic
  - review of proof techniques
  - analysis of recursive programs
- **CSI 2120 Programming Paradigms**
  - imperative / object-oriented / logic / functional
  - influence of programming paradigms on problem solving and program design strategies

Programming languages in this course (1)

Scheme

- Functional programming language
- A subset of Lisp
- Still used in mobile application development

```
(define fact!
  (λ (n)
    (let loop ((n n) (acc 1))
      (if (= n 1)
          acc
          (loop (- n 1) (* acc n))))))
```

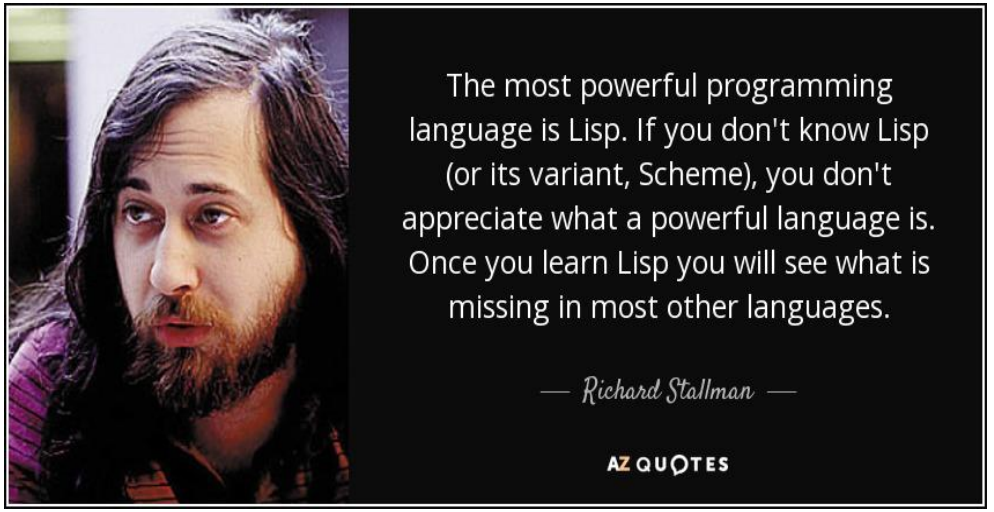
Resources

Chris Varao's video tutorial
www.youtube.com/user/ChrisVARao/videos

The Scheme Programming Language 4th ed
http://www.scheme.com/tspl4/

Yet another Scheme Tutorial
https://www.shido.info/lisp/idx_scm_e.html

Chapter 15 of Sebesta's book 11th ed



Programming languages in this course (2)

Prolog

- Logic-based programming language
- Primarily used as a teaching and research tool

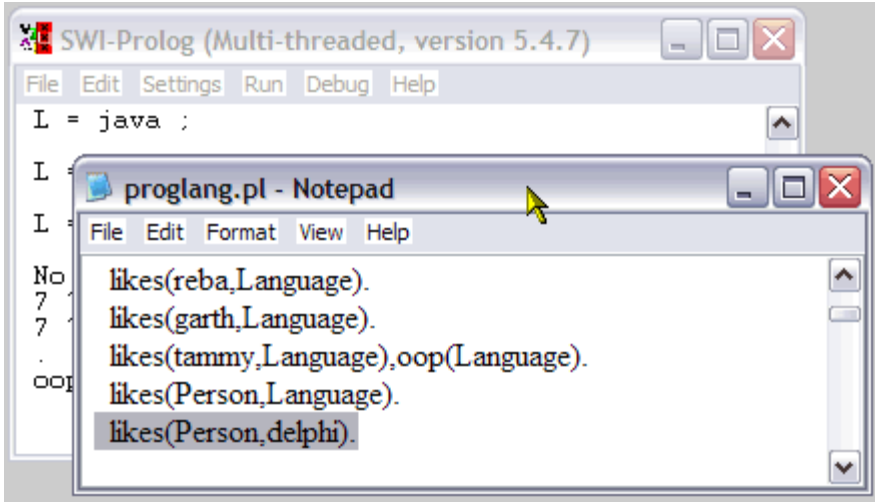
Resources

Learn Prolog Now!
www.learnprolognow.org

A short tutorial on Prolog
http://www.doc.gold.ac.uk/~mas02gw/prolog_tutorial/prologpages/

SWI Prolog
http://www.swi-prolog.org/

Chapter 16 of Sebesta's book 11th ed



Programming languages in this course (3)

Perl

- Imperative, scripting programming language
- The “glue” in complex Web systems

Resources

Perl Tutorials
https://learn.perl.org/tutorials/

Perl @ Tutorials Point
http://www.tutorialspoint.com/perl/

Perl Beginners Site
http://perl-begin.org/tutorials/

```
sub find_file($$) {
    my ( $type, $id ) = @_;
    if ( $type == 1 ) {
        my $pl = plpack::load "$::BASE/.net_pl";
        my $wh =
          CBOR::XS::decode_cbor Compress::LZF::decompress $pl->("!whisper");
        $wh->{plversion} >= $id or return;
        return "$::BASE/.net_pl";
    }
    elsif ( $type == 2 or $type == 3 ) {
        $id = pack "H*", $id if length $id == 64;
        my $reply = $reg{$id} or return;
        return $reply->[0];
    }
    ();
}
```

Programming languages in this course (4)

R

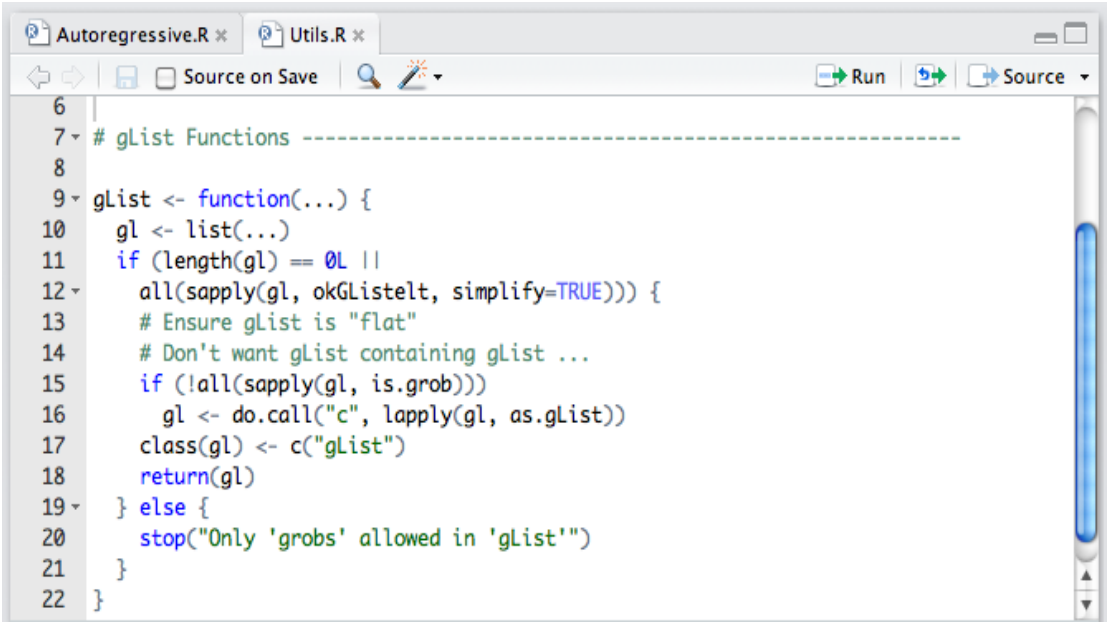
- Imperative, scripting programming language
- The leading statistical analysis and data science language

Resources

Data Camp
https://www.datacamp.com

Try R @ Code School
http://tryr.codeschool.com/

R @ Tutorials Point
http://www.tutorialspoint.com/r/



Topics

1) Preliminaries
2) Recap of Prolog and Scheme
3) Evolution of the major programming languages
4) Describing the syntax of programming languages
5) Describing the semantics of programming languages
6) Syntactic analysis and parsing
7) An introduction to Perl
8) An introduction to R
9) Names, bindings, type checking, and scopes; data types; expressions and the assignment statement; statement-level control structures; subprograms
10) Implementing subprograms
11) Concurrency and exception handling

Course Schedule and Website

Lectures Thursdays 8:30 - 11:30 am, CBY B012

Lab 1 Mondays 5:30 - 7:00 pm **STE 0130** (TA)

Lab 2 Tuesdays 1:00 - 2:30pm **STE 0131** (TA)

Tutorial Mondays 8:30 - 10 am **MRT 250** (Instructor)

Course web site:

http://www.site.uottawa.ca/~rfalc032/Courses/csi3120_2016/

Evaluation

4 assignments [HW]	30 marks
midterm exam (80 min.) [MT]	25 marks
final exam (3 hours) [FN]	45 marks

You must receive **at least** 35/70 exam marks:

if MT + FN < 35

then Total = (MT + FN) * 1.43

else Total = MT + FN + HW;

Exams

- The exams are closed book, but a cheat sheet or two will be allowed.
- Midterm: October 20 (in class)
- No midterm makeup exam; if absence justified, weight is transferred to the final exam
- Both exams will be a mixture of multiple-choice questions and open questions.

Assignments

Tentative topic and dates	Posted	Due
Preliminaries; History; Prolog; Scheme [7.5 marks]	Sept. 20	Oct. 4
Grammars; Axiomatic semantics; Syntactic analysis [7.5 marks]	Oct. 4	Oct. 18
Perl [7.5 marks]	Oct. 31	Nov. 17
R; design issues [7.5 marks]	Nov. 17	Dec. 1

Assignments (continued)

One written assignment (#2).

One programming assignment (#3).

Two written/programming assignments (#1, #4).

Late submission penalty:

10% for each day late

Academic Integrity

- Copying of assignments, even with substantial changes, is a serious form of academic fraud and will not be tolerated.
- Examples of academic fraud:
  - Submitting work prepared by someone else or for someone else
  - Using work you have previously submitted for another course without your professor's permission
  - Falsifying or making up information or data
  - Falsifying an academic evaluation
  - Submitting work you have purchased on the Internet
  - Plagiarizing ideas or facts from others
- More on academic integrity and plagiarism here.

Academic Integrity

- All the parties involved will be penalized
- Students giving away their solution to others will be penalized.
- Do not let anyone know your password
- Do not leave your workstation unattended while you are logged in.
- It is your responsibility to ensure that your work is not copied by someone else.

Academic Integrity: Assignment Submissions

- Someone asks you for your assignment
  - He/she is your friend…
  - He/she is too late to complete the assignment…
  - all parties involved get zero (0).
- Other penalties:
  - The files are sent to the Vice Dean Academic Affairs
  - Student gets zero for the assignment, for all the assignments, for all the non-test components of the course, for the course, student is required to take an ethics course, student is expelled.

Welcome to

CSI 3120
Programming Languages Concepts