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School of Computer Science, University of Guelph
CIS*4650 (Winter 2022) Compilers [0.50]

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Instructor: *Fei Song*
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    Office Hours: Tue and Fri, 3:30 – 5:00 pm (Zoom meetings)

Graduate Teaching Assistants: Arslan Kazmi, Kevin Sullivan, and Sina Radpour
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    Office Hours: Mon, 3:30 – 4:30 pm, Wed, 1:30 – 2:30 pm, & Thu, 3:30 – 4:30 pm
      (Zoom meetings: only between Jan. 17 and Apr. 7)

Course website: https://courselink.uoguelph.ca/

This course provides an introduction to different programming paradigms followed by a detailed study on the compilation process of a procedural programming language. Students will gain an in-depth understanding of the compiler construction process by considering the fundamental issues such as scanning, parsing, building and checking the intermediate representation of a program, and code generation. The knowledge learned will be put into practice through the construction of a fully functioning compiler for a simple procedural language using the widely adopted tools (JFlex and CUP) and a general-purpose programming language (Java). More specifically, the implementation exercises are designed to reinforce various concepts that are typically abstracted by tools during compiler construction in order to provide a complete picture of the compiler design and implementation process.

Students are expected to have a solid background in modular programming, assembly language, and basic computer architecture (e.g., registers, memory organization, etc.). Experience with the development of large software projects such as those practiced in CIS*2750, CIS*3750, and CIS*3760 will be beneficial.

Prerequisites: CIS*2030, CIS*3110, and CIS*3150

Evaluation

- Warmup assignment: 10% (due on Feb. 4)
- Three checkpoints for the project: 45% (due on Mar. 7, Mar. 21, and Apr. 6)
- Midterm: 20% (online on Feb. 16, 2022, 7:00 – 8:00 pm)
- Final exam: 25% (online on Apr. 25, 2022, 7:00 – 9:00 pm)

For Winter 2022, this course will be offered in the asynchronous format in that all the lectures will be pre-recorded, but the office hours and project demos will be conducted through online meetings. The students are required to view the recorded lectures at their earliest convenience so that they can understand the related concepts and techniques in a timely fashion and be more productive for the project implementations. Late submissions are not encouraged, and there will be a deduction of marks by 10% for one day late, 25% for two days late, and 50% for three days late. No marks will be given for late submissions that are more than three days late.

Recommended References

Alfred Aho, Monica Lam, Ravi Sethi, and Jeffrey Ullman. *"Compilers: Principles, Techniques, and Tools"*, Second Edition, Pearson, 2006.

John R. Levine, Tony Mason, and Doug Brown. "*Lex & Yacc*" 2nd Edition. O'Reily & Associates, 1992. (Available on CourseLink)

Disclaimer

Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings, changes in classroom protocols, and academic schedules. Any such changes will be announced via Courselink and/or class email. This includes on-campus scheduling during the semester, mid-terms and final examination schedules. All University-wide decisions will be posted on the COVID-19 website (https://news.uoguelph.ca/2019-novel-coronavirus-information/) and circulated by email.