Functional Programming in OCaml, CSCI 49201

General information

Mon, Wed, 3:20 - 5:25 pm. Hunter North 1516.
Office hours: after the class or by appointment.
Instructor: Alexey Nikolaev
Website: https://a-nikolaev.github.io/fp/
Email: anikolaev -at- gradcenter.cuny.edu
Office: HN 1000C

Overview

This is a practical hands-on course on functional programming using OCaml. The goals of the course are: to help you learn the functional programming paradigm, and more broadly, to improve your ability to learn any new technology or programming language, which will make you a better programmer and computer scientist.
We will be solving programming problems in class, in groups and individually. Small homework assigned every week for better material retention. A project in the second half of the semester, in which you will be implementing a program or tool of your choice using functional programming principles. A final exam at the end of the semester.

Grading

- 25% attendance and work in class
- 15% homework
- 40% project
- 20% final exam

Tentative schedule

May 29. Expressions. Functions. Recursion.
Jun 3. Lists. Pattern matching. Local name binding.
Jun 5. Common built-in types. Printing. Semicolon. Tuples. Accumulators.
Jun 10. Tail call optimization. Option type. Map, filter, iter.
Jun 12. Variant types. Reading files.
Jun 17. Currying. Pipeline operator. Fold.
Jun 19. Records and modules
Jun 24. Recursive variant types. Binary search trees. S-expressions. Examples with Opal and Cairo.
Jun 26. Module signatures. Functors. Map and Set.
Jul 1. Monads. Memoization. Delayed computation. Sequences. Lambda calculus.
Jul 3. Final Exam.
Jul 8. Project presentations.

Academic Integrity Policy

We take academic honesty very seriously, and any violation results in an automatic F for the course along with sanctions in accordance with Hunter College procedure. Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures.

Disability Policy

In compliance with the American Disability Act of 1990 (ADA) and with Section 504 of the Rehabilitation Act of 1973, Hunter College is committed to ensuring educational parity and accommodations for all students with documented disabilities and/or medical conditions. It is recommended that all students with documented disabilities (Emotional, Medical, Physical and/ or Learning) consult the Office of Accessability located in Room E1124 to secure necessary academic accommodations. For further information and assistance please call (212-772-4857)/TTY (212-650-3230).

Sexual Misconduct Policy

In compliance with the CUNY Policy on Sexual Misconduct, Hunter College reaffirms the prohibition of any sexual misconduct, which includes sexual violence, sexual harassment, and gender-based harassment retaliation against students, employees, or visitors, as well as certain intimate relationships. Students who have experienced any form of sexual violence on or off campus (including CUNY-sponsored trips and events) are entitled to the rights outlined in the Bill of Rights for Hunter College. a. Sexual Violence: Students are strongly encouraged to immediately report the incident by calling 911, contacting NYPD Special Victims Division Hotline (646-610-7272) or their local police precinct, or contacting the College's Public Safety Office (212-772-4444). b. All Other Forms of Sexual Misconduct: Students are also encouraged to contact the College's Title IX Campus Coordinator, Dean John Rose (jtrose@hunter.cuny.edu or 212-650-3262) or Colleen Barry (colleen.barry@hunter.cuny.edu or 212-772-4534) and seek complimentary services through the Counseling and Wellness Services Office, Hunter East 1123.