C404: Assembly Language

Course summary

This course covers the organization and behavior of real computer systems at the assembly-language level. Topics include the mapping of statements and constructs in a high-level language onto sequences of machine instructions, as well as the internal representation of simple data types and structures. Numerical computation and subroutines are examined.

Course Goals

You will gain the following knowledge in topics related to assembly language:

- Intel and AMD processor architecture and programming.
- Describe von Neumann architecture and how its components interact.
- Real-address mode and protected mode programming.
- Assembly language directives, macros, operators, and program structure.
- Demonstrate how fundamental high-level programming constructs are implemented at the machine-language level.
- Understand the Assembly Language's procedures, parameter passing and stack operations.
- Programming methodology, showing how to use assembly language to create system-level software tools and application programs.
- Diagnosing and debugging assembly language programs.

Textbooks

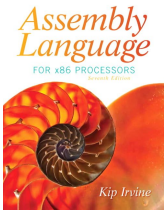

Figure 1: Assembly Language for x86

- *Assembly Language for x86 Processors*
- by **Kip Irvine**
- Pearson 2019, 8th Edition

Lab Resources

It is quite important to try all examples in the lecture notes. You have two options:

1. Use online compilers (Quick and easy):
    - OneCompiler.com
2. See Lab(1)

Grading

Activity	Weight
Labs	40%
Final Exam	60%

Tentative Schedule

Week #	Topic	Kip	Assignment
Week 1	Basic Concepts	Ch.1-2	
Week 2	Assembly Language Fundamentals	Ch.3-4	Lab(1)