

Topics to Study for Exam I

We encourage you to study all of the following topics for Exam I. Feel free to ask questions on Piazza if a topic is unclear. Each of the six key topics (listed in bold) will be covered approximately the same on the exam.

Introductory and Miscellaneous Material

What makes up a computer system?

Terms: programming, algorithms, binary

C++ program structure (preprocessing directives, code blocks, main)

Programming cycle

Constants, variables, and data types

Naming rules and conventions for identifiers

Standard I/O

Include files: iostream, iomanip, cmath, fstream

Pseudocode

Statement types: Sequence vs. Selection vs. Repetition

Pseudo random numbers and seeding

Operators and Arithmetic

Assignment operator (=)

Multiple Assignment - +=, -=, *=, /=

Increment and decrement operators (postfix and prefix – addition and subtraction)

Binary operators, including %

Relational operators (e.g., <, <=, >=, ==, etc.)

Logical operators (i.e., &&, ||, and !) and expressions

Operations with mixed data types

Evaluating Arithmetic Expressions (precedence)

Boolean expressions (true or false)

Boolean Expressions via Relational Operators

Short circuiting

Selection Statements

if, if-else, if-else-if

switch statement (case, break, default)

one statement vs. multiple statement (i.e., code block {...})

Repetition Statements

for, while, do-while loops

Breaking loops - break and continue

Infinite loops

File Input/Output

File Streams and fstream class

5 Steps for file reading

File reading functions: open, fail, eof, get, close, clear

5 steps for file writing

File writing functions: put, setw, open, is_open, fail, close

I/O and Classes

I/O Loop Structures (counter-controlled loops, sentinel-controlled loops, end-of-data loop)

I/O Errors

Functions

Abstraction

Function header (return type, function name, parameter list)

Function body

Function prototype

Pass by value and pass by reference

Scope