ESE112 Exam 1 Study Guide

Exam Information

- Tuesday March 2nd from 12-1 pm in Towne 307
- Closed book closed notes
- Bring a calculator

I. Circuits

- Ohms law (Relationship between V, I, R), Kirchhoff’s Voltage and Current Law
  - Voltage Divider (In general be able to analyze problem using circuit theory)
  - Current flow convention
- Know the basics units of Voltage, Resistance, Current, and Power
- Know basic circuit symbols and schematics

II. BoeBot

- Data type limitations
- I/O pins (which are used for servos)
- Servos pulsewidth
- You do not need to memorize any classes (this will be provided if a question is asked).

III. Java Programming

Basics

- Literals
- Primitive types: int, double, char, boolean
- Non-primitive type: String (note difference between char and String representation)
- Operators: arithmetic, boolean, relation, and assignment operators
  - Operator Precedence – only operators covered
- Expressions: value and type
- Variables: initialization and re-initialization.
  - Regular variable vs. constant (final keyword)
  - Naming rules vs. syntax rules
- What is a Statement
- System.out.println(..)
Control Structures

- Loops: While, for, do
- If statements: all three flavors (if by itself, if-else, if-else if)
- Break vs. continue
- Dangling else problem
- When can we not use {} with if or while statements
- Nested if and loop statements

Methods

- Method header: return type and input(s)
- Method body: work the function performs
  - Must finally return something (if not void) using return statement.
- How to call method with a class, outside a class
- For now all methods will be public and static
- Syntax of main method and why we need main

Scope

- Scope of method within method/if/loop block
- Scope of method parameters
- Scope of global variables

Syntax vs. Semantic Errors

- Typical Syntax errors: semicolon, case sensitive statements, variables undefined, return statement errors
- Semantic Problems (encountered after executing the programs): output not behaving as expected (usually order of statements or increments are wrong), infinite loops.

Java program Structure

- Class and filename
- Import statement