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Section: 002

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CS/ECE 252 Introduction to Computer Engineering

Spring 2018
Instructor: Adil Ibrahim

Homework 1
Deadline: January 31st 2018

Primary contact for this homework: Amogh Joshi (asjoshi4@wisc.edu)

Problem 1 **(3 points)**

a. List the date, time, and location of all exams for this course.

Midterm 1 Feb 14th 12:05 PM Noland Zoology Building Rm 132
Midterm 2 Mar 7th 12:05 PM Noland Zoology Building Rm 132
Midterm 3 April 11th 12:05 PM Noland Zoology Building Rm 132
Midterm 4 May 2nd 12:05 PM Noland Zoology Building Rm 132

b. Do you have a conflict with any of the exams? If so, have you informed your instructor about the conflict?

No, I do not have any conflicts with any of the exams.

c. Do you have a final exam for this course? If so, what is its date, time, and location?

We do not have a final exam in this course.

Problem 2 **(4 points)**

(This question has no wrong answers.)

a. What is your expected major(s)?

My expected major is Computer Science

b. Please list all computer science courses you have taken in the past, if any.

CS 302: Intro to Programming
CS 354: Machine Organization and Programming
CS 367: Intro to Data Structures
CS 540: Intro to Artificial Intelligence

c. Please list all computer science courses you plan on taking concurrently, if any.

CS 240: Discrete Mathematics

d. Why are you taking this course? What do you hope to get out of this course?

I am taking this class to fill the requirements needed for the computer science major and to learn more about the hardware of computers.

Problem 3 **(4 points)**

a. Name three characteristics of algorithms. Briefly explain each of these characteristics.

1. Definiteness - Describes the notion that each step is precisely stated.

2. Effective Computability - Describes the notion that each step can be carried out by a computer

3. Finiteness - Descrives the notion that the procedure terminates.

b. Explain the difference between a compiler and an assembler.

A compiler translates from a high-level language to the ISA of the computer. An assembler translates from the unique assembly language of a computer to its ISA.

Problem 4 **(3 points)**

Explain the following terms:

a. Operand

Operand is used to describe individual data values.

b. Data Types

Data types are representations for an operand such that the computer can perform operations on that representations.

c. Addressing modes

Addressing Modules are the mechanisms that the computer can use to figure out where the operands are located.

Problem 5 **(4 points)**

John said, "I saw a man in the park with a telescope".

a. How many reasonable interpretations can you provide for this statement? List them.

There are at least three interpretations for this statement.

1. John has seen a man who was in the park and the man has a telescope.
2. John saw a man in the park while John was looking through a telescope.
3. John was in the park looking through a telescope when he saw a man

b. What property does this sentence demonstrate that makes it unacceptable as a statement in a program?

This statement has ambiguity because it can be interperated in many ways. This is unacceptable for computers because statements must be precisely stated for computer instruction.

Problem 6 **(5 points)**

a. The ISA specifies the logic devices which can be used to implement a microarchitecture. True/False?

False

b. Briefly explain the difference between microarchitecture and ISA.

ISA specifies the set of instructions the computer can carry out. Microarchitecture is the detailed organization of an implementation.

c. Can there be more than one logic circuit implementation for a microarchitecture?

Yes there can be more than one logic circuit implementation for a microarchitecture so the logic desginer can decide how to make the trade offs between cost and performance.

d. List at least three things specified by an ISA.

1.The set of instructions that the computer can carry out.

2.The mechanisms that the computer can carry out.

3.The number of unique locations that comprise the computer's memory and the number of individual 0's & 1's that are contained in each location.