



EGCP 180: -01/02 – Digital Logic and Computer Structures

Spring 2024

Lecture 7: Topics for Midterm Exam No 1

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Office Hour: Monday and Wednesday 2:00 - 3:30 pm

Or by appointment

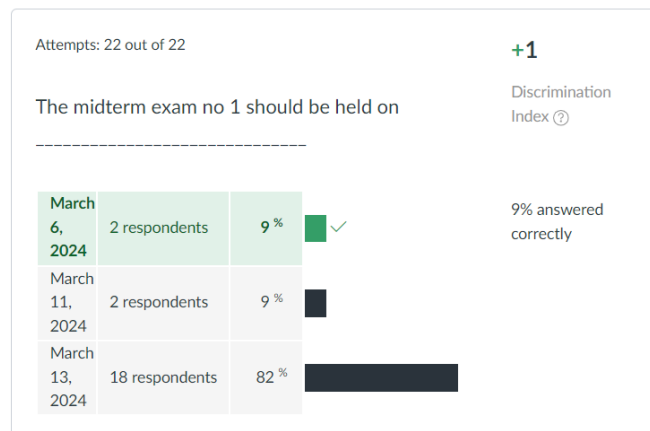
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Midterm Exam No 1

- Day: March 13th 2024
- Time: 11:30 AM
- Lecture Slides from 1 to 7
- Bring a cheat-sheet of one page (A4 Size), pen, pencil and calculator.



Conversion

- Binary
- Octal
- Hexadecimal
- 1's Complement
- 2's Complement
- Negative number representation

- 1.4 (a) Convert to hexadecimal: 1457.11_{10} . Round to two digits past the hexadecimal point.
(b) Convert your answer to binary, and then to octal.
(c) Devise a scheme for converting hexadecimal directly to base 4 and convert your answer to base 4.
(d) Convert to decimal: $DEC.A_{16}$.

Arithmetic Operations

- Adding two Binary, Octal, Hexadecimal number
- Subtraction of two Binary, Octal, Hexadecimal number
- Subtraction using 1's and 2's Complement
- Multiplication
- Division

Add the following numbers in binary using 2's complement to represent negative numbers. Use a word length of 6 bits (including sign) and indicate if an overflow occurs.

(a) $21 + 11$ (b) $(-14) + (-32)$ (c) $(-25) + 18$

(d) $(-12) + 13$ (e) $(-11) + (-21)$

Repeat (a), (c), (d), and (e) using 1's complement to represent negative numbers.

Boolean Algebra

- Boolean Functions
- Truth Table
- Logical Circuits
- Minterm
- Maxterm
- K-Map

From a 4-bit Instruction Register we have the following Truth Table (instruction decoding).
a) Express the Boolean functions using minterms and maxterms representations. b) Provide the Boolean functions using Sum of Products (SOP), and Product of Sums (POS).

A	B	C	D	F1
0	0	0	0	0
0	0	0	1	0
0	0	1	0	1
0	0	1	1	0
0	1	0	0	1
0	1	0	1	1
0	1	1	0	1
0	1	1	1	0
1	0	0	0	0
1	0	0	1	0
1	0	1	0	0
1	0	1	1	1
1	1	0	0	1
1	1	0	1	0
1	1	1	0	1
1	1	1	1	0

Q&A

