CSE 390B, Spring 2023

Building Academic Success Through Bottom-Up Computing

Test-taking Strategies & Mock Midterm

Test-taking Strategies, Midterm Practice Exam, Practice Exam Walkthrough and Rubric

Lecture Outline

- **Test-taking Strategies**
  - **Maximizing Success on Exam Day**
- Midterm Practice Exam
  - Mock Exam, Debrief, and Reflection
- Practice Exam Solutions and Rubric
  - Walkthrough of Solutions and Exploring Sample Rubrics

Test-taking Strategies Discussion

- What are some test-taking strategies you have previously utilized in taking your exams?
- Were those test-taking strategies effective for you? Why or why not?
- Which test-taking strategies might you try implementing on the CSE 390B midterm or any other upcoming exam?

Test-taking Strategies

- Survey the entire exam before beginning
  - Helps plan how much time to allocate for each problem
- Read exam directions and question statements carefully
  - Use highlights, underlines, circles on important details
- Answer the questions you feel the most confident in first
- If stuck on a problem, make a mark on the problem and revisit the question later

Test-taking Strategies

- Prioritize how you will answer questions
  - Do this based on confidence level for each type of question or how long you think each will take
- Rely on a methodological approach for each question
  - Helps make taking the test feel more systematic
- If stuck on a question, demonstrate what you know
  - Many exam questions reward partial credit
- If time allows, double check your answers
  - Catches any small mistakes that may have been made earlier

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Midterm Practice Exam

- The exam is closed-note, closed-book
  - You may only use the midterm reference sheet
- Questions are not necessarily in order of difficulty
- You will have 30 minutes to complete the mock exam
  - We will give you a 5-minute warning
- Remember to relax and take deep breaths

Test-Taking Self-Assessment

- Reflect on which test-taking strategies you utilized:
  - When you received the exam
  - As you were answering the questions
  - When you got stuck
  - When wrapping up the exam

- What did you learn about yourself through this process? About your test-taking practices?

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Question 1: Circuit Design

Part a: Truth Table

A_t	B_t	A_{t+1}	B_{t+1}
1	1	1	0
1	0	0	1
0	1	0	0
0	0	1	1

11 → 10 → 01 → 00 → 11

Question 1: Circuit Design

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$A_{t+1} = (A_t \,\&\, B_t)$

$A_{t+1} = (\sim A_t \,\&\, \sim B_t)$

Part b: Boolean Expressions

Question 1: Circuit Design

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$B_{t+1} = (A_t \,\&\, \sim B_t) \mid (\sim A_t \,\&\, \sim B_t)$

$= \sim B_t \,\&\, (A_t \mid \sim A_t)$ [Factor out $\sim B_t$]

$= \sim B_t$ [$A_t \mid \sim A_t = 1$]

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$= \sim B_t \,\&\, (A_t \mid \sim A_t)$ [Factor out $\sim B_t$]

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Part c: Drawing the Circuit

Question 1: Circuit Design

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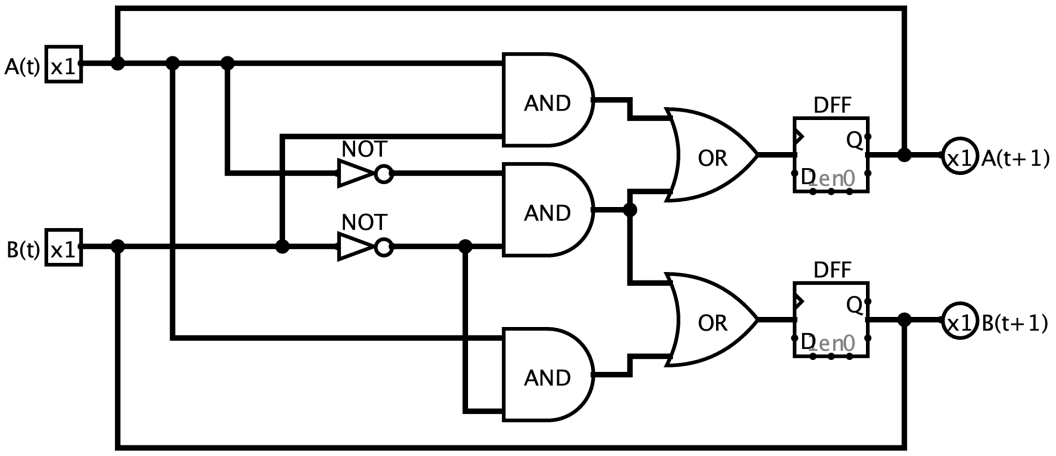
1	1	1	0
1	0	0	1
0	1	0	0
0	0	1	1

Part c: Drawing the Circuit



Part b: Boolean Expressions

$$A_{t+1} = (A_t \,\&\, B_t) \mid (\sim A_t \,\&\, \sim B_t)$$

$$B_{t+1} = (A_t \,\&\, \sim B_t) \mid (\sim A_t \,\&\, \sim B_t)$$

$$= \sim B_t \,\&\, (A_t \mid \sim A_t) \qquad [\text{Factor out } \sim B_t]$$

$$= \sim B_t \qquad [A_t \mid \sim A_t = 1]$$

Question 1: Circuit Design Sample Rubric

Category	Points	Criteria
Truth Table	4 points	1 point for each row in the truth table that is correct
Boolean Expressions	6 points	❖ 4 points for correct expression for A_{t+1} ▪ 2 points if truth table is wrong but expression matches truth table ❖ 2 points for correct expression for B_{t+1} ▪ 1 point if truth table is wrong but expression matches truth table
Circuit Diagram	5 points	❖ 3 points for having circuits that match the Boolean expressions in part b ❖ 2 points for fully correct diagram
Total	**15 points**	

Question 2: Math Puzzle

Dana needs 300 pickets for her colorful picket fence. She wants equal amounts of each of her 4 selected colors. She already has 32 red, 26 green, 9 yellow, and no blue. If the pickets cost 25 cents and you get 20% off if you purchase 50 or more of the same color, and 30% off if you purchase 60 or more of one color, how much does Dana need to spend? List your answer to two decimal places. You may use a calculator application on your computer to solve this problem.

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Solution

$$75 - 32 = 43\ red$$
$$75 - 26 = 49\ green$$
$$75 - 9 = 66\ yellow$$
$$75 - 0 = 75\ blue$$

$$43 \times 0.25 + 49 \times 0.25 + 0.7 \times 66 \times 0.25 + 0.7 \times 75 \times 0.25$$
$$= \$47.675$$
$$= \$47.68$$ (Rounding down is also acceptable)

Question 3: Hack Assembly Programming

Write a Hack assembly program that stores -1, 0, or 1 in R1 based on the sign of R0. To be more specific, your program should store a -1 in R1 if R0 is negative, a 0 in R1 if R0 is 0, and a 1 in R1 if R0 is positive.

`j1` ($out < 0$)	`j2` ($out = 0$)	`j3` ($out > 0$)	Mnemonic	Effect
0	0	0	`null`	No jump
0	0	1	`JGT`	If $out > 0$ jump
0	1	0	`JEQ`	If $out = 0$ jump
0	1	1	`JGE`	If $out \geq 0$ jump
1	0	0	`JLT`	If $out < 0$ jump
1	0	1	`JNE`	If $out \neq 0$ jump
1	1	0	`JLE`	If $out \leq 0$ jump
1	1	1	`JMP`	Jump

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Equivalent pseudocode:

```
if (R0 < 0){
        R1 = -1;
} else if (R0 > 0){
        R1 = 1;
} else {  //R0 == 0
        R1 = 0;
}
```

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One solution:

```
    @R0
    D = M
    @NEGATIVE
    D; JLT
    @POSITIVE
    D; JGT
    // R0 == 0 case
    @R1
    M = 0
    @END
    0; JMP
(NEGATIVE)
    // R0 < 0 case
    @R1
    M = -1
    @END
    0; JMP
(POSITIVE)
    // R0 > 0 case
    @R1
    M = 1
(END)
    @END
    0; JMP
```

Question 3: Hack Assembly Sample Rubric

Category	Points	Criteria
Has Infinite End Loop	1 point	❖ 1 point if program has an Infinite End Loop
Conditional Checks	4 points	❖ 2 points for having at least two checks for cases. Almost all solutions will need a check for 2 of the three cases (negative, zero, positive). ❖ 2 points for correctly matching jump condition to cases (e.g. jump to negative case when negative, etc.)
Assigns Correct R1 Value	3 points	❖ One point for each case: ▪ negative: R1 = -1 ▪ zero: R1 = 0 ▪ positive: R1 = 1
Fully Correct Implementation	2 points	❖ Covers any little mistakes that may result in an incorrect implementation (e.g., forgetting to jump to the end when a case is done)
Total	**10 points**	

Question 4: Metacognitive Skills

- Name two metacognitive skills that we have covered in CSE 390B so far.

Post-Lecture 11 Reminders

- **CSE 390B midterm this Thursday (5/4) during lecture at 2:30pm**
- Project 6 (Mock Exam Problem & Building a Computer) due next Thursday (5/11) at 11:59pm
- Preston has office hours after class in CSE2 121
  - Feel free to post your questions on the Ed board as well