CSE 390 B Spring 2021

Mock Exam, Test-Taking Strategies

Mini mock exam, intro to test-taking strategies, & exam design 101

Significant material adapted from www.nand2tetris.org. © Noam Nisan and Shimon Schocken.

Agenda

- **Mock Exam**
- Debrief & Test-Taking strategies
- Self-Grading Your Mock Exam
- Designing Exams 101

Mock Exam

- This exam is closed-note, closed-book
  - You may only use the midterm reference sheet available under the "Resources" page on our course website
- Have your zoom video on and mics muted during the exam
- Questions are not necessarily in order of difficulty
- You have 25 minutes to complete the exam
  - We will give you a 5 min warning
- When you are finished, take a picture of your paper and upload it to Gradescope.
- BREATHE.

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Evaluating your test-taking practices...

Mock Exam Debrief & Reflection

- What did you learn about yourself through this process? About your test-taking practices?
- What are two test-taking strategies that you would like to engage with in your next exam? Why?
- What is one thing that can help you relax and calm down before or during your exam?

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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

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

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

Part b: Boolean Expressions

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

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

$= (A_t \mid \sim A_t) \,\&\, \sim B_t$

$= \sim B_t$

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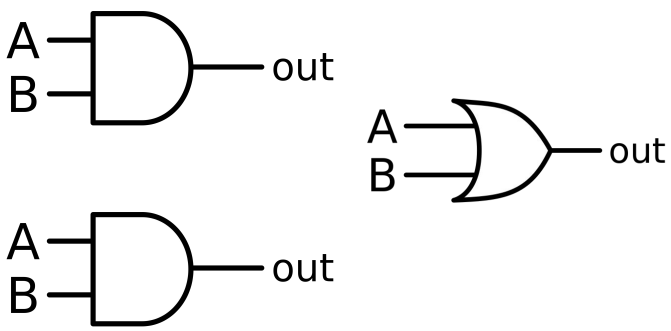

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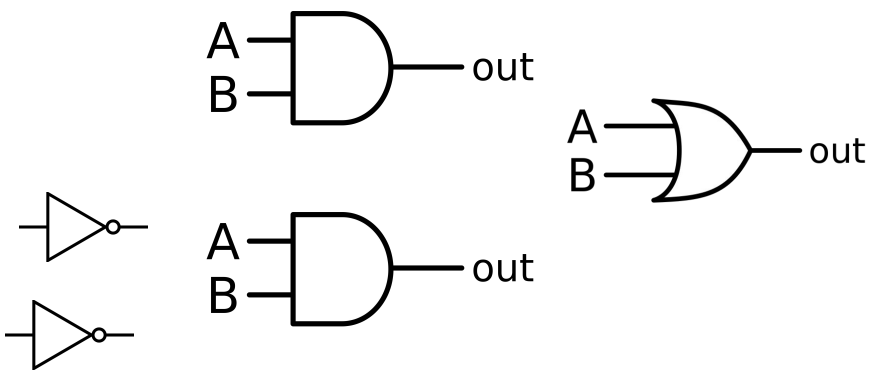

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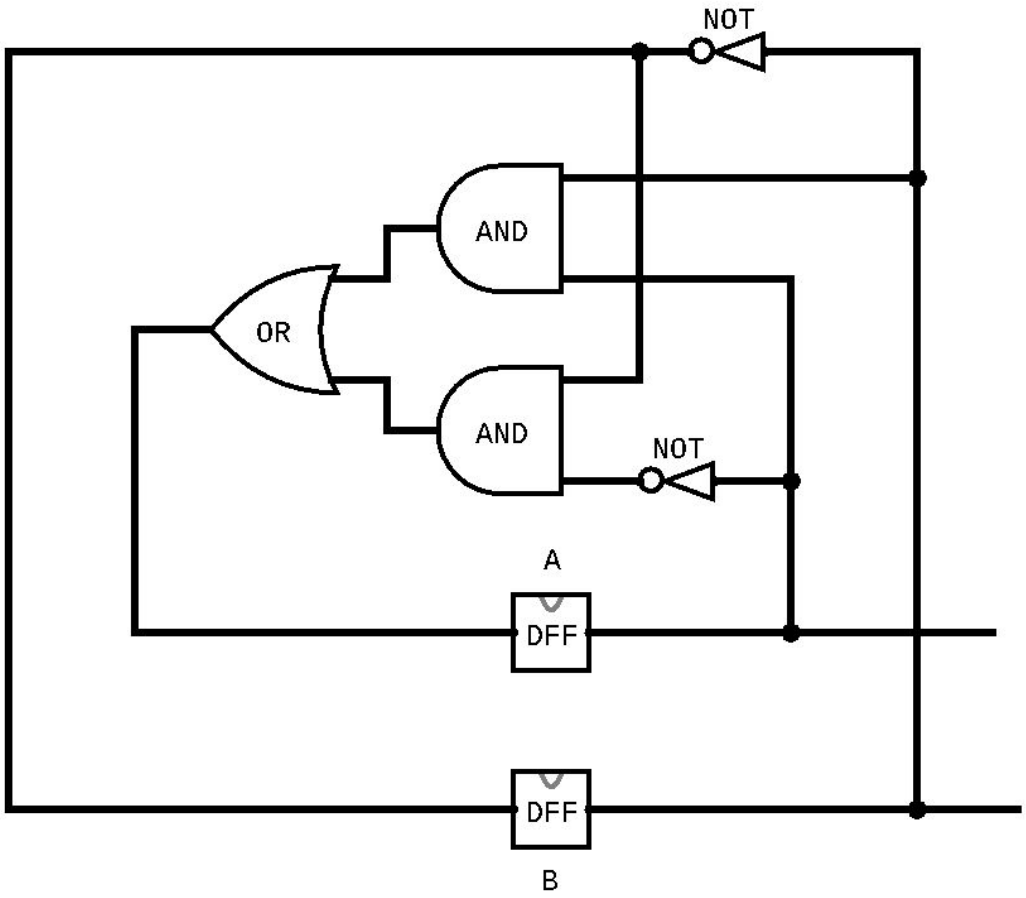

Question 1: Circuit Design Sample Rubric

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 * 0.25 + 49 * 0.25 + 0.7 * 66 * 0.25 + 0.7 * 75 * 0.25 = $47.675 = $47.68

(rounding down is fine too)

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.

Equivalent pseudocode:

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

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

Our solution:

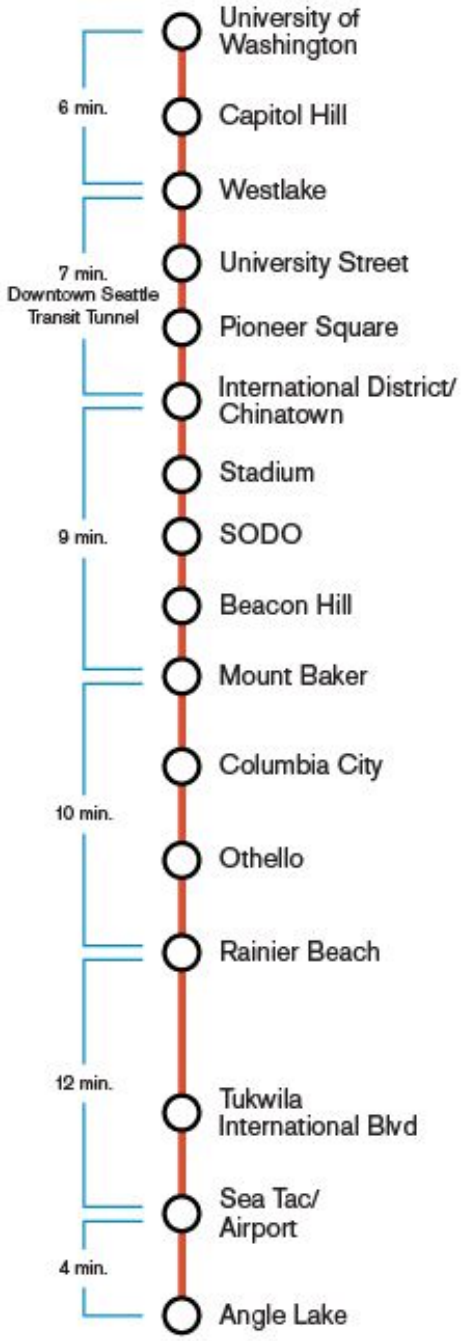
```
    @R0
    D = M
    @NEGATIVE
    D; JLT
    @POSITIVE
    D; JGT
    // R0 == 0 case
    @R1
    M = 0
    @END
    0; JMP
(NEGATIVE)
    // R0 < 0 case
    @R1
    M = -1
    @END
    0; JMP
(POSITIVE)
    // R0 > 0 case
    @R1
    M = 1
(END)
    @END
    0; JMP
```

Question 3: Hack Assembly Sample Rubric

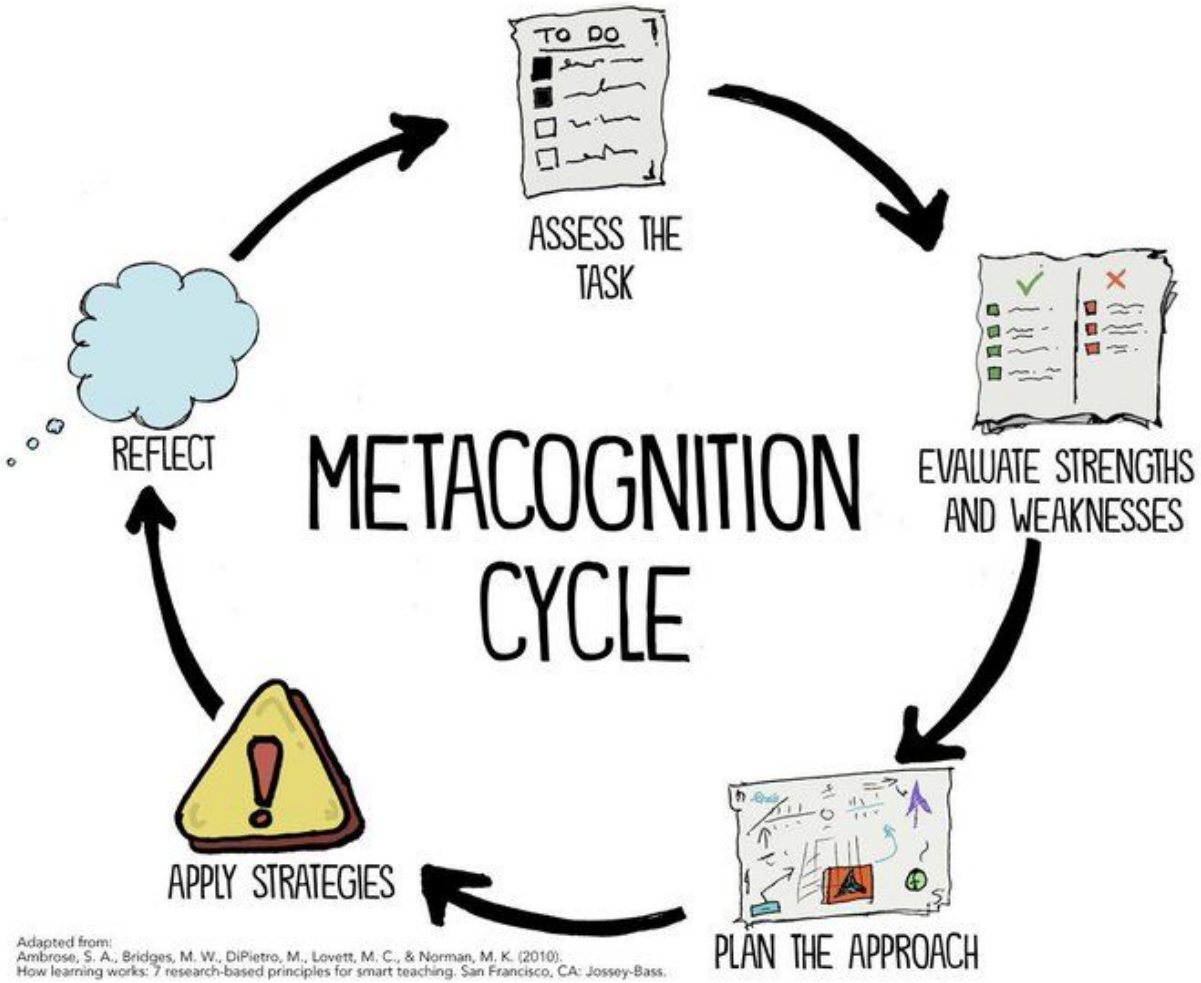
Category	Points	Criteria
Has Infinite End Loop	1 point	1 Point if program has an Infinite End Loop
Conditional Checks	4 points	2 points for having at least two checks for cases. Almost all solutions will need a check for 2 of the three cases (negative, zero, positive). 2 points for correctly matching 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: R = 1
Fully Correct Implementation	2 points	Covers any little mistakes that may result in a not quite correct implementation (e.g. forgetting to jump to the end when a case is done).
Total	**10 points**	

Question 4: Link Light Rail

Name two (2) stations that the Seattle Link Light Rail train stops at.

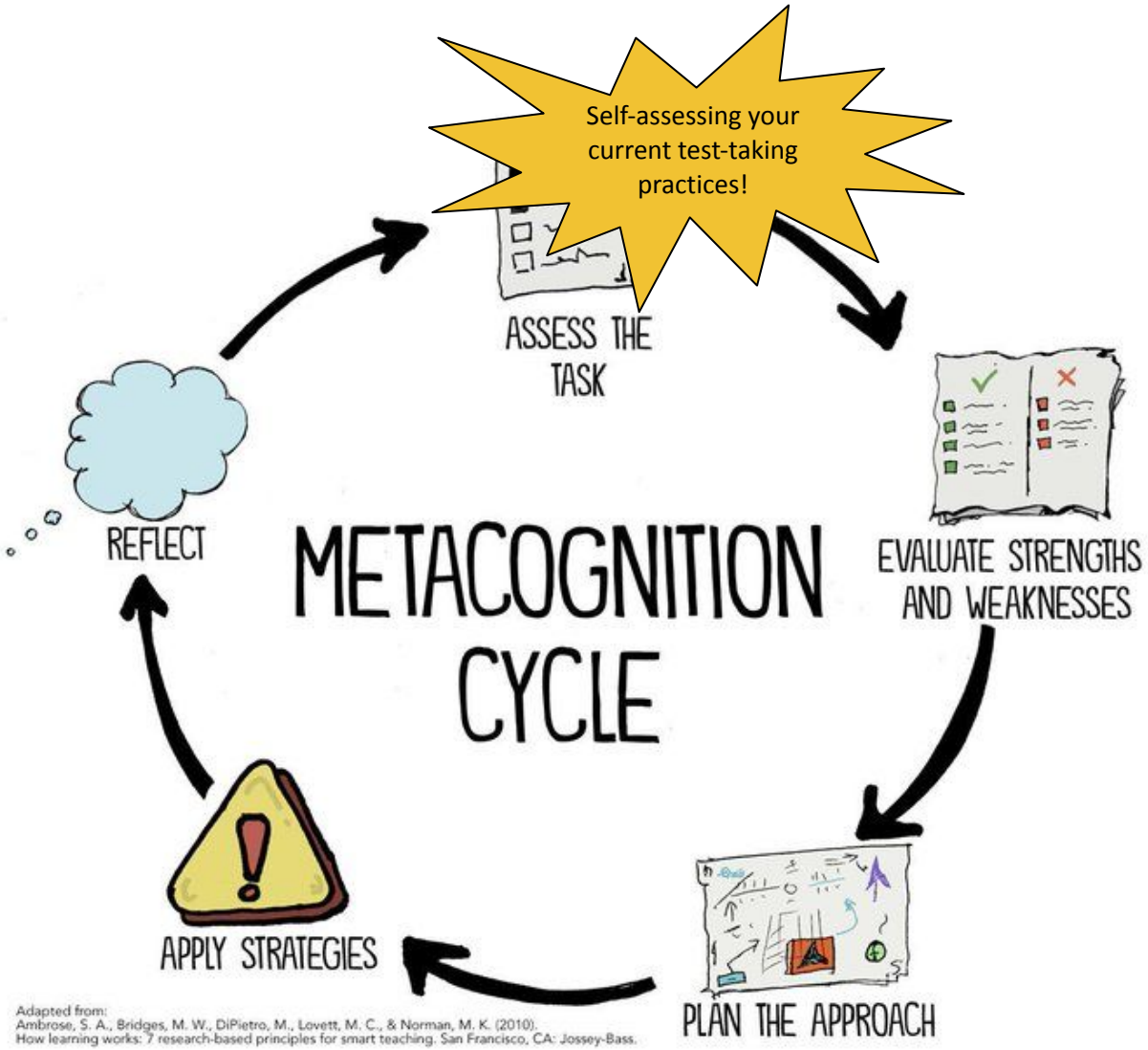


Why are we making you doing this...



Adapted from:
Ambrose, S. A., Bridges, M. W., DiPietro, M., Lovett, M. C., & Norman, M. K. (2010). How learning works: 7 research-based principles for smart teaching. San Francisco, CA: Jossey-Bass.

Why are we making you doing this...



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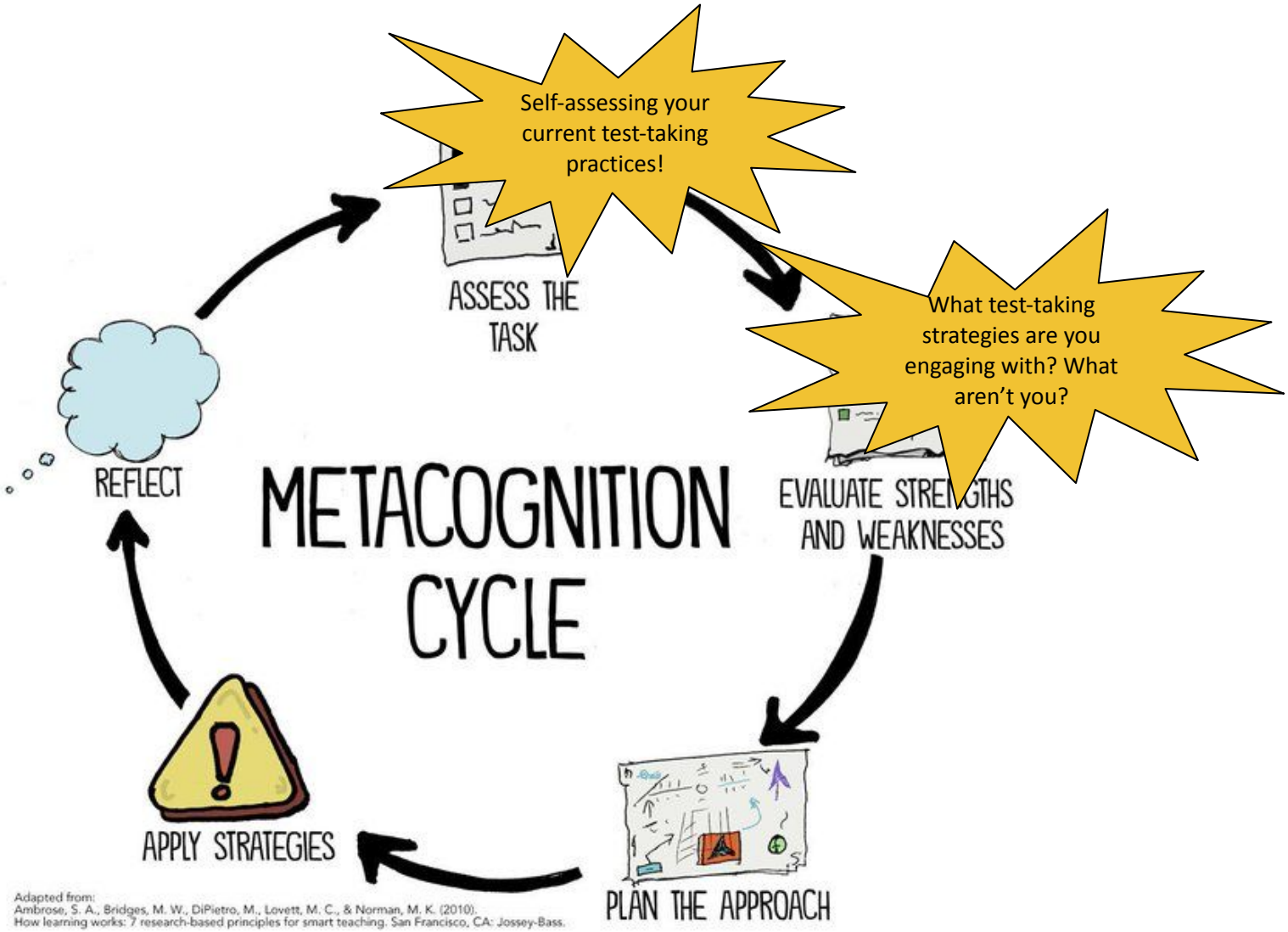

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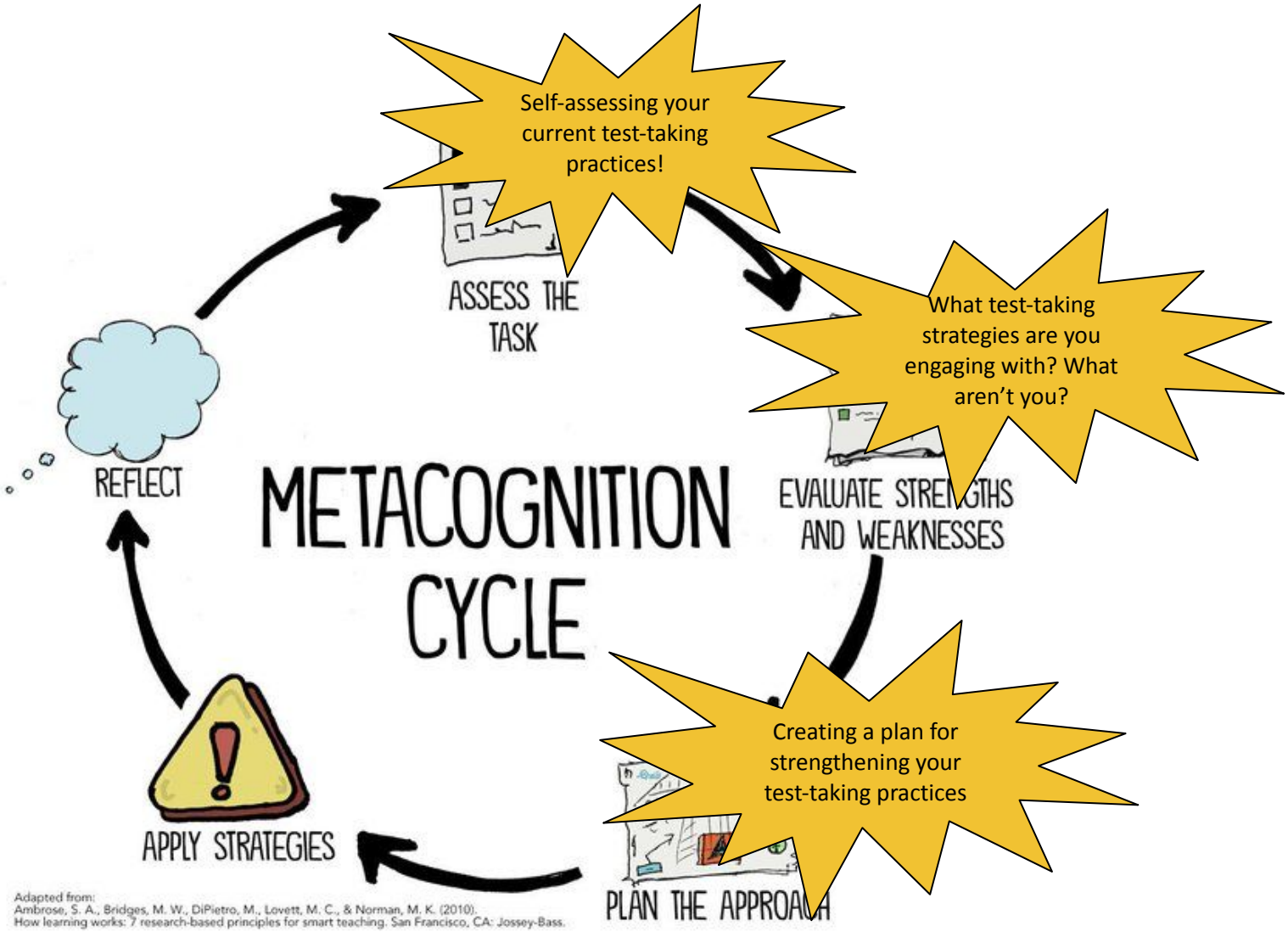

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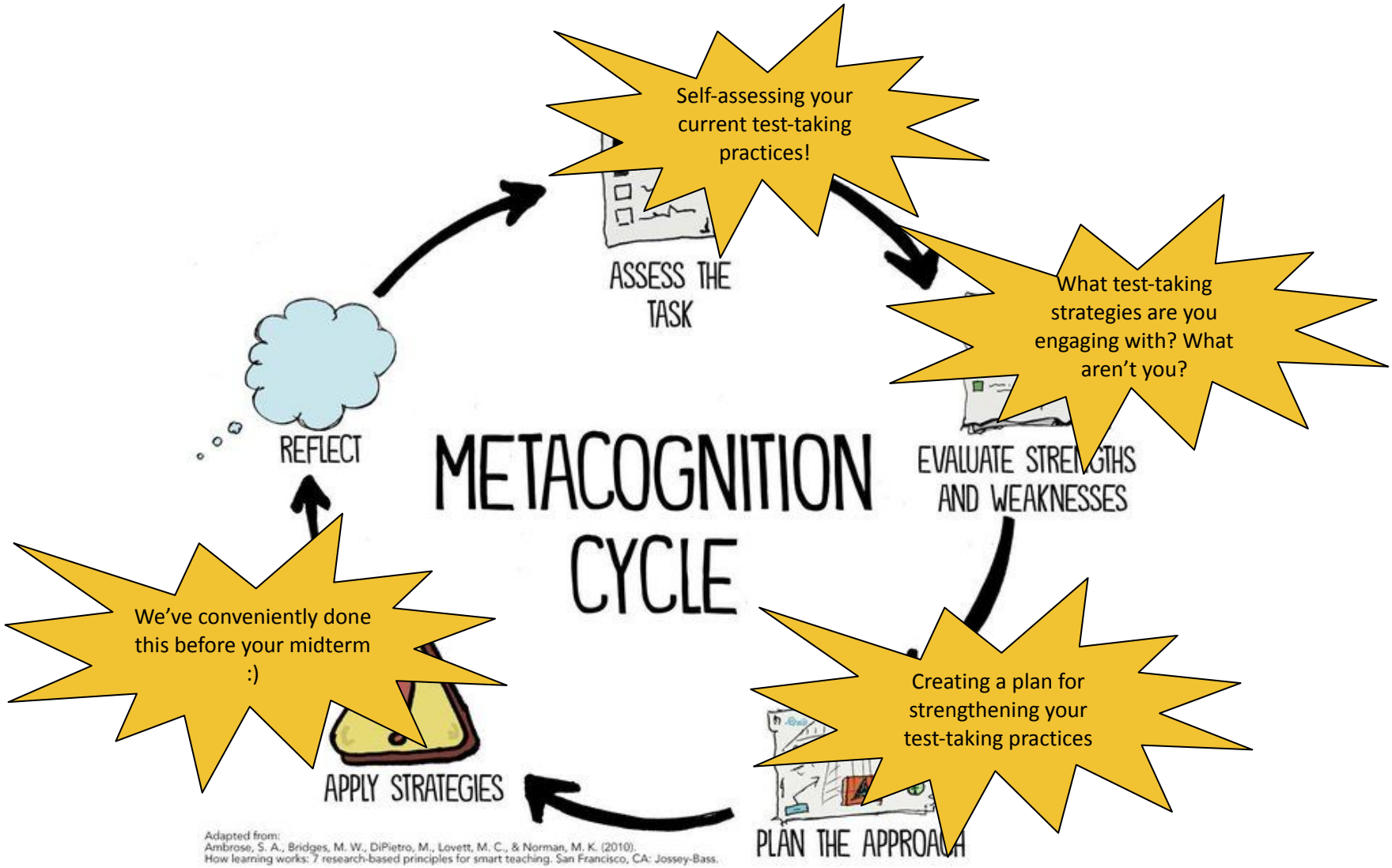

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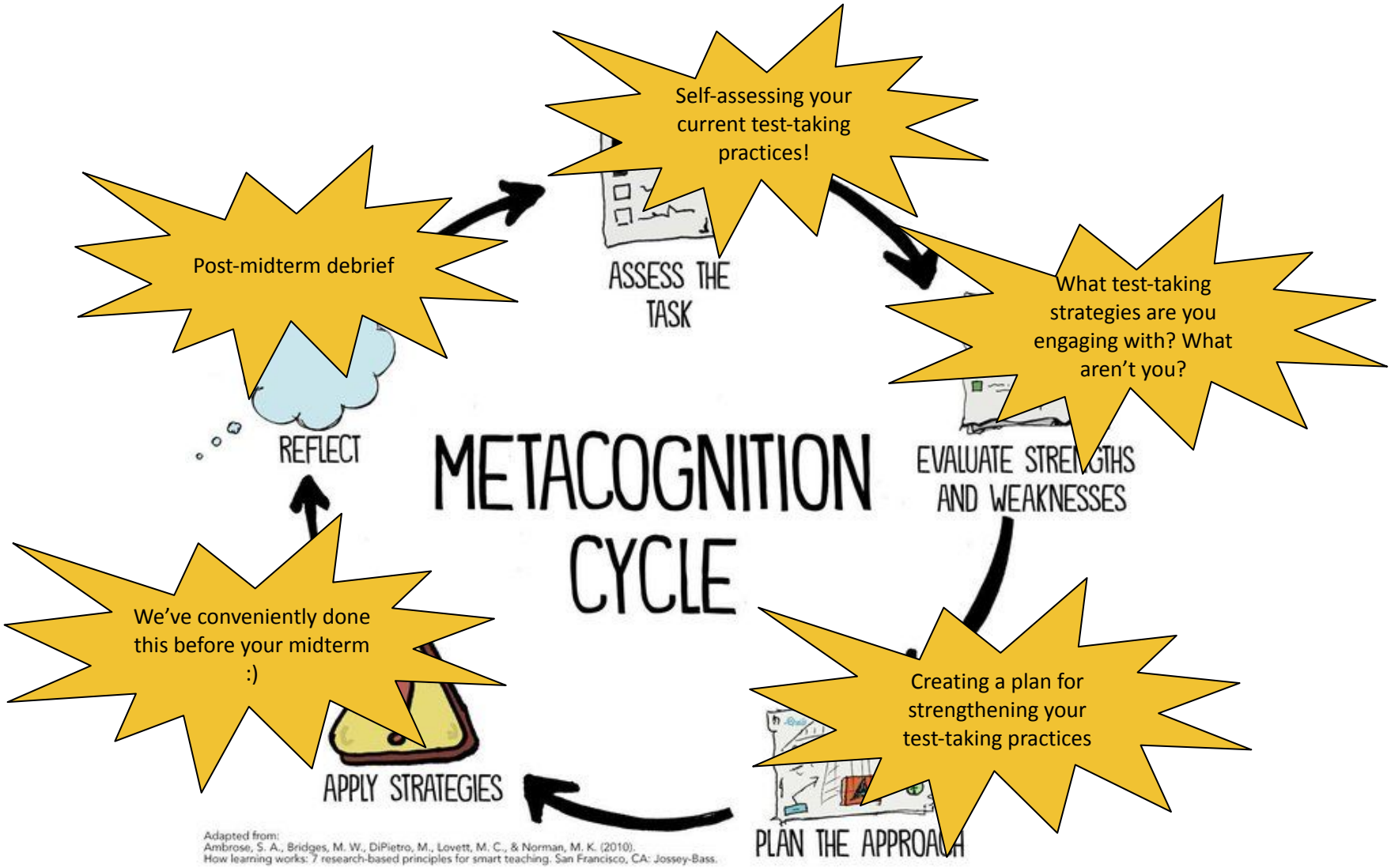

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How (Some) Instructors Write Exams And How Knowing This Can Be Metacognitive Gold

Intended purpose of an exam

Goals:

- **Assess** students' **mastery** of the **learning objectives**
- Have **grades** correlate with level of mastery

Practicalities:

- Fit in available time
- Reasonably easy to grade (e.g., answers pretty short!)
- Complement vs. repeat homework coverage
- Similarity or not compared to sample/old exams

Bloom's Taxonomy (!)

- If you study how to do some mechanical drill and the instructor tests the conceptual design, uh-oh!
- And vice versa!

So this is tricky… we're not going to tell you what's on the exam.

And learning objectives aren't always explicit.

Best to know the details and the big ideas.

Example: BST insertion

1. Insert 17 into this BST.
2. In 1-2 English sentences, what makes a binary tree a binary search tree.
3. Give *all* the BSTs that contain exactly the numbers 5, 7, 9, and 25.
4. Suppose in every node of a binary tree T, the left child is less than the parent and the right child is greater than the parent. Is T definitely a BST? If not, give a counterexample.
5. Write a Java method that takes a BST and returns the second smallest element. You can assume the input has at least two elements.

Some connection to a learning objective

- A question is about some topic or topics in the course
- First meta-answer as you take an exam: what topics is it testing?
  - The "whole trick" to the question might be answering this, particularly for harder questions
  - Or it may be obvious

Range of difficulty

- Ideally each question would have the perfect range of natural partial credit available

- In practice, often need some easier questions and some harder questions to correlate with mastery
  - Don't lose time on the wrong-difficulty questions
  - But requires some guessing to know which is which

Exams are only one form of evaluation

- Time-pressured exams are **not** an objective measure of your learning or your abilities in a subject
  - They are one type of evaluation and favor certain learning styles/habits/mental organization
  - They are a reflection of the priorities/style/mindset of your instructor and are only one view of the material
  - If you don't do well on an exam, it doesn't mean you haven't learned anything or are not as "smart" as your peers.

- Unfortunately, many classes in our educational system make frequent use of high-stakes, time-pressured exams
  - Our goal in this class is to help you improve your skills related to preparing, taking, and reflecting on these exams

Reminders

- **Midterm** on Thursday
  - Consider signing on a few minutes early to get settled
- **Project 5** due next Thursday (5/13)
  - Timed Mock Exam
  - Build a Computer!
  - Social Computing Reflection II
- **Course registration** is approaching…