Exam & Scope

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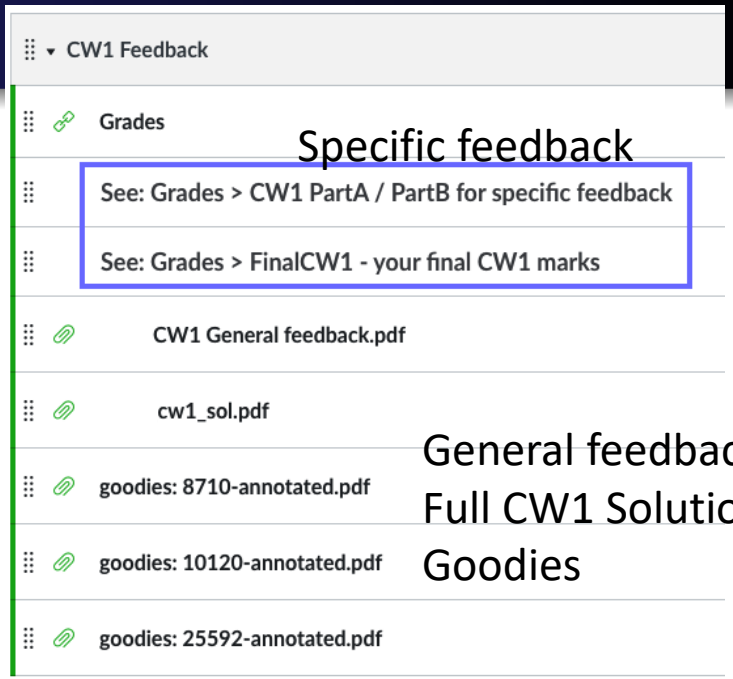
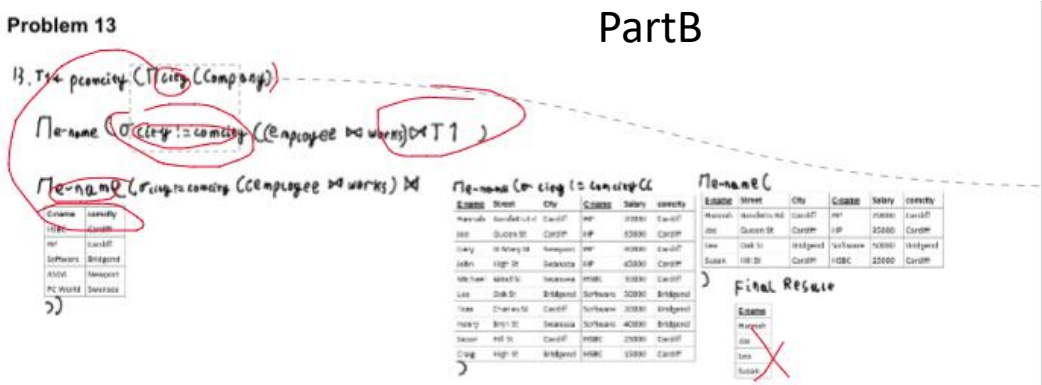
CWs Feedback

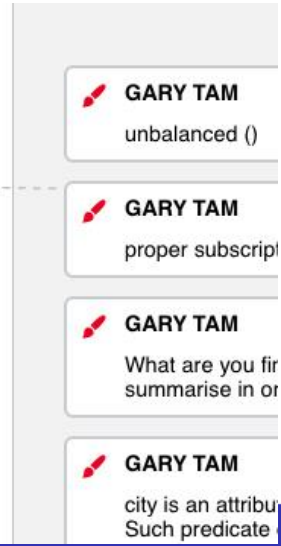
- Canvas > Modules > CW? Feedback / Sols
- Canvas > CS-250 > Grades > CW? PartA / CW? PartB



Individual feedback
PartA



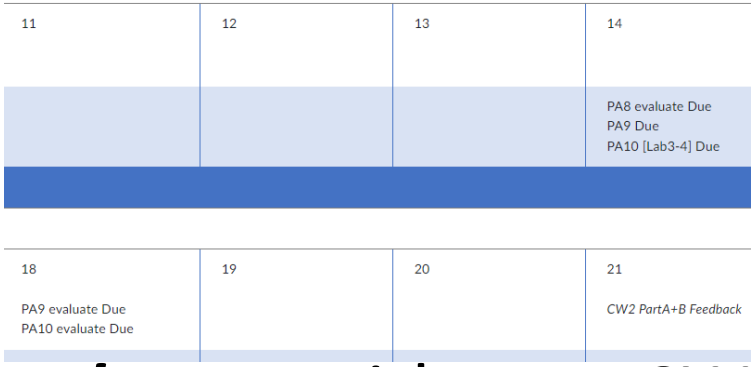
Individual feedback
PartB



Lectures, Tutorials, PAs

- This marks the end of CS250 and all teachings. There is no lectures or tutorials next week.

- PA9/PA10 Due 12 Dec 23:59.
- PA9/10 peer reviews due on 16 Dec (Mon) 23:59.
- Solution will be released online.



- If you are ***not happy*** with your CW2/3 efforts, remember that you can still get effort marks via Peer Assessments (wk9,10).

Peer Assessments

- PA = 1x Submit + 3x Evaluate

- Gary will check all PAs after 16th Dec.
- Anyone who submits but ***consistently*** not evaluates others will have their effort marks ***SET to zero***.
- They are not participating anyway.

Assessment

	CS-250
Coursework1: Relation Algebra	10% Same
Coursework2: SQL + PHP System	PartA: 10% (+ ½ PAs Boost)
	PartB: 10% (+ ½ PAs Boost)
Examination	**70%**

Yr2 courses:

Pass: ≥ 40% overall

Onsite Examination:

Date: 13 Jan 2024

Time: 2-4pm

Venue: Sports Hall, Sketty Lane

For individual situation, here are some other venues. Check your exam schedule, and go to the right place:

Great Hall 014, Bay
Nanhyfer 1, Bay
Nanhyfer 5, Bay
SOM110, Bay
SOM113, Bay Campus (Provisions)
SOM117, Bay (PC Provisions)

Exam system
https://intranet.swan.ac.uk/catalogue/examtime.asp?dept=CSCI
Canvas CS Student Information Hub
https://canvas.swansea.ac.uk/courses/22654/

Always check the latest information

Examinations

- Format:
  - Answer ***All*** Questions!!! ~~2 out of 3 questions~~
  - Full marks 50 marks
  - University dictionary allowed, but ***no*** calculator

- ***Types of questions (Similar to CWs)***
  - ***Multiple Choices x15 (advise to spent 1 hr)***
  - ***Handons x2 (advise to spent 1 hr)***
  - ***----------***
  - ***Total 17x questions***

Examinations

- Multiple choices (No "Multiple Answer" question)
  - Each question 4-5 possible options
  - Labelled (a, b, c, d, or e)
  - There is ONLY ***one correct*** answer to each question
  - Answers must be put in ***multiple choice answer sheet***
  - The respective marks of a question are shown next to the question.
  - A correct answer will score the specified marks. An incorrect answer will score 0 marks.
  - If you block out more than one answer, you will score 0, even if one of your answers is correct.

- Handons
  - Write your answer in answer book. Do not leave it blank.

Examination

- Multiple choice answersheet
- Auto-marking

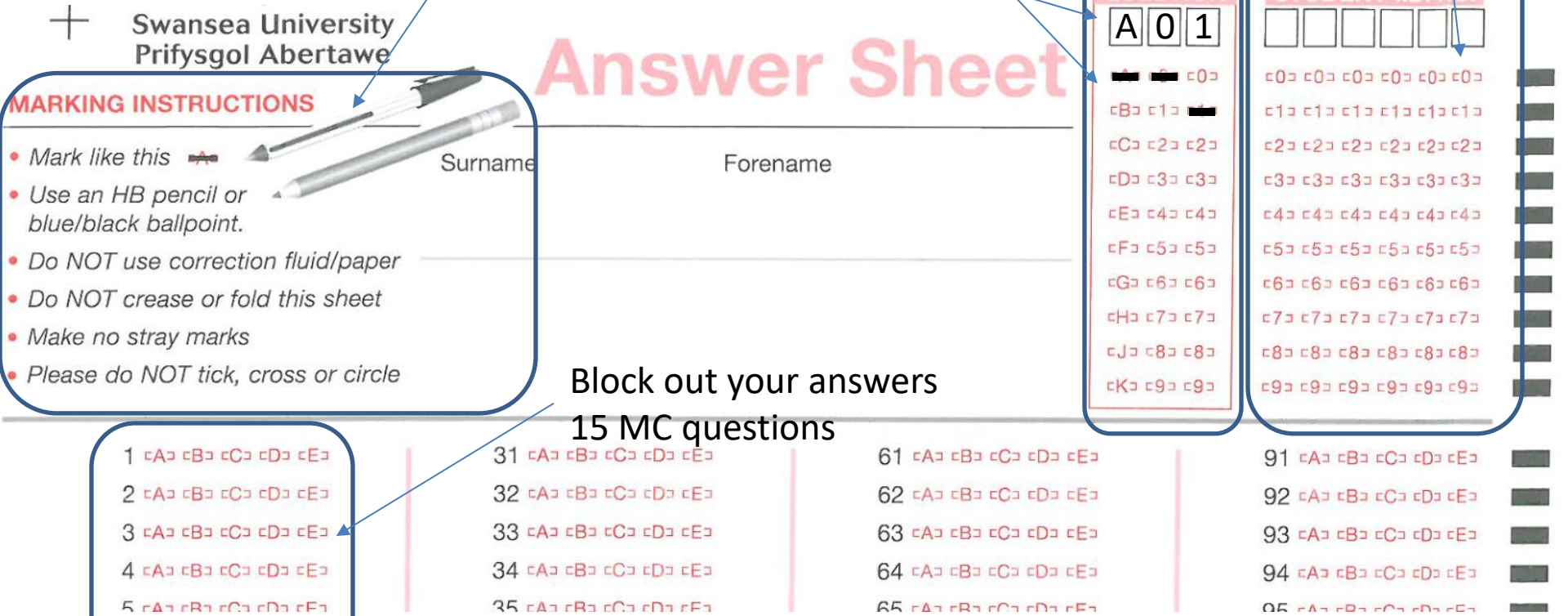
Number of boxes should match the number of digits of your ID

Block out the digits below

Put your student id here

Put 'A01' here

1) Always read instruction
2) Follow instructions from Exam officers.



Block out your answers
15 MC questions

Examinations

- Marks distribution

Bookworks	Very Basic application	Standard application	Challenging questions
10/50	10/50	17/50	13/50

Expect all of you get these – a pass

Marks for modal range

Top-Decile Only

Need further reading, critical thinking and deeper understanding of materials.

Samples

Bookworks	Very Basic application	Standard application	Challenging questions
10/50	10/50	17/50	13/50

- Explain the terms super keys, candidate keys, primary keys and foreign keys. Provide examples to illustrate each of them. [6 marks]

- (i) Give an example of how you would create an index on an attribute or field in SQL.

- See sample questions on Canvas too

Samples

Bookworks	Very Basic application	Standard application	Challenging questions
10/50	10/50	17/50	13/50

Problem 1. In an ER Diagram, what is used to present a relationship? **(@1)**

Problem 5. Which is an entity in a database designed for one hotel? **(@1)**

a) opening hours
b) room
c) address
d) self-rated stars

Some bookwork questions are inspired from students' mistakes.
You have likely seen those in peer assessments, and feedback to peers.

Samples

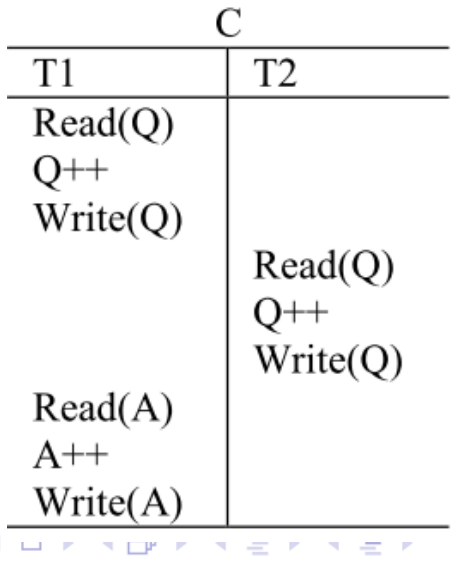
Bookworks	Very Basic application	Standard application	Challenging questions
10/50	10/50	17/50	13/50

- Write simple SQL / relational algebra to…

Question 1. How many customers have registered an Iceland account but never made a purchase?

```
SELECT Count(custid)
FROM   cust
```

- Show that it is / not conflict serializable.



MC questions are rephrased by offering options

a) Common mistakes from past students
b) Distractors etc

Samples

Bookworks	Very Basic application	Standard application	Challenging questions
10/50	10/50	17/50	13/50

- Better understanding of materials

Problem 23. Which is a join condition in the following SQL statement? **(@1)**

```
select A.name from B, C where B.x = 1 and B.y = C.y
```

Table T

A	*B*	*C*
1	10	100
2	10	10
3	40	100
4	30	200
5	25	90
6	10	200
7	10	90
8	10	10

Problem 29. What does the following SQL statements do? **(@2)**

```
create table T2 like T;
insert into T2 select * from (select * from T) as t1;
```

Can you explain it using at most 15 words? (i.e., comments in CWs)

Samples

Bookworks	Very Basic application	Standard application	Challenging questions
10/50	10/50	17/50	13/50

- Explain the following error message:

```
ERROR 1062 (23000): Duplicate entry 'p1' for key 'PRIMARY'
```

Have you done all the labs? SelfLab1-4

- Functional dependency

You are given the following functional dependencies:
A→BD, AC→E, D→A
Use only Armstrong's Axioms (i.e., reflexivity, transitivity, augmentation) to show that CD→E.

Samples

Bookworks	Very Basic application	Standard application	Challenging questions
10/50	10/50	17/50	13/50

- Careful analysis

Problem 13. Get the name of employees who live in Swansea but work in Cardiff

$\Pi_{\text{e-name}}(\sigma_{\text{city}=\text{"cardiff"}}(\Pi_{\text{e-name}}(\sigma_{\text{city}=\text{"swansea"}}(\text{employee})) \bowtie \text{company}))$

$T1 \leftarrow \Pi_{\text{e-name,city}}(\sigma_{\text{city}=\text{"swansea"}}(\text{employee}))$
$T2 \leftarrow \Pi_{\text{e-name,city}}(\sigma_{\text{city}=\text{"cardiff"}}(\text{works} \bowtie \text{company}))$
$\Pi_{\text{e-name}}(T1-T2)$

$T1 \leftarrow \Pi_{\text{e-name,city}}(\sigma_{\text{city}=\text{"swansea"}}(\text{employee}))$
$T2 \leftarrow \Pi_{\text{e-name,city}}(\sigma_{\text{city}=\text{"cardiff"}}(\text{works} \bowtie \text{company}))$
$\Pi_{\text{e-name}}(T1) - \Pi_{\text{e-name}}(T2)$

$T1 \leftarrow \Pi_{\text{e-name}}(\sigma_{\text{city}=\text{"Cardiff"}}(\text{company} \bowtie \text{works}))$
$T2 \leftarrow \Pi_{\text{e-name}}(\sigma_{\text{city}\neq\text{"Swansea"}}(\text{employee}))$
$\Pi_{\text{e-name}}(T1 - T2)$

$T1 \leftarrow \sigma_{\text{city}=\text{"Swansea"}}(\text{employee})$
$T2 \leftarrow \sigma_{\text{city}=\text{"Cardiff"}}(\text{company})$
$\Pi_{\text{e-name}}(T1 \bowtie T2 \bowtie \text{works})$

Analyze different ways of writing queries?
Do you understand their meanings?
Or even, can you rewrite them differently?

Set Theory ⇔ Relational Algebra ⇔ Calculus ⇔ SQLs

Samples

Bookworks	Very Basic application	Standard application	Challenging questions
10/50	10/50	17/50	13/50

```
select distinct T1.B
from T as T1
where not exists (
    select * from T as T2
    where not exists (
       select * from T as T3
       where T1.B = T3.B and T3.C = T2.C
   )
);
```

A	*B*	*C*
1	10	100
2	10	10
3	40	100
4	30	200
5	25	90
6	10	200
7	10	90

What does the query do?

What is the query result?

Apply knowledge to unseen problems

(ii) An index is normally created to speed up database processing (e.g. retrieval or updates). Explain why this is not always true and give an example to illustrate your answer.

Samples

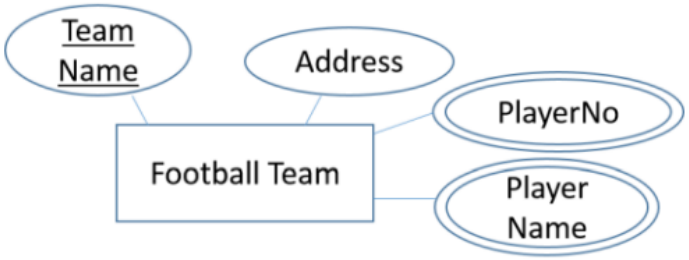
Bookworks	Very Basic application	Standard application	Challenging questions
10/50	10/50	17/50	13/50

Problem 6. Which ER diagram would likely lead to the following set of table schemas. **(@3)**
Underlined attribute: primary key. Italic attribute: foreign key.

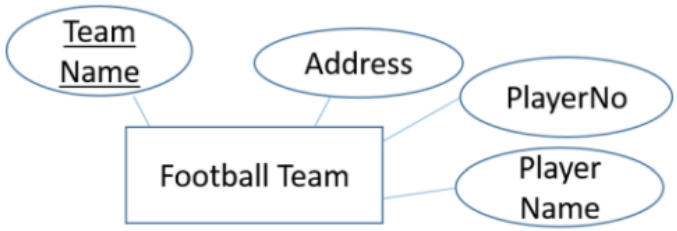
ER diagram ⇔ ER=>Tables

FootballTeam (TeamName, Address)
Player (*TeamName*, PlayerNo, PlayerName) reference (FootballTeam)

a)



b)



Question 2. How many students in 2001/02 have not selected a module which is compulsory for their programme and level? Count the student only once if he/she has multiple such modules. You are ***NOT*** allowed to use **IN** or **Left/Right (Outer) Join** for this question. Otherwise, 50% marks will be deducted. **(15 marks)**

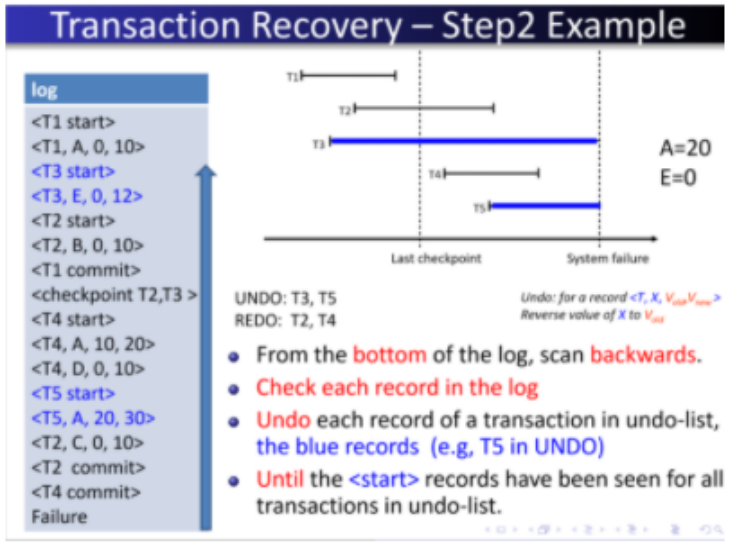
Do you know alternative answers to these SQL questions?

Set Theory ⇔ Relational Calculus ⇔ Algebra ⇔ SQL

Examinations

Bookworks	Very Basic application	Standard application	Challenging questions
10/50	10/50	17/50	13/50

- Student asked good questions in class/discussion board.
- ***Unique*** challenging questions are inspired from them.



Transactions ⇔ Concurrency ⇔ Recovery

This example log of transactions from today's Recovery lecture slides. T4 writes to A and (I assume) therefore has access to Lock-X(A). Afterwards, T5 writes to A too, but I thought this wasn't possible as it cannot get a Lock-X(A) as T4 is currently holding it?

Samples

Bookworks	Very Basic application	Standard application	Challenging questions
10/50	10/50	17/50	13/50

Question 3. Find the order(s) (orderid) which contain(s) the fewest number of categories of items. Multiple items of the same category will count as one category. You are not allowed to use *min, all* or *limit* to answer this question.

```
SELECT orderid
FROM   (SELECT orderid, Count(DISTINCT item_cat) AS countCat
```

Question 2. How many students in 2001/02 have not selected a module which is compulsory for their programme and level? Count the student only once if he/she has multiple such modules. You are ***NOT*** allowed to use **IN** or **Left/Right (Outer) Join** for this question. Otherwise, 50% marks will be deducted. **(15 marks)**

- Remember:
  - **Handons** section may help you score!
  - ***Don't leave it blank***.
  - If you are in the ***right direction***, partial marks will be awarded.

Past student's feedback

- *"The CW also was too restrictive, not allowing the use of built in functions in SQL such as max(), is unrealistic in a real-world env."*
- *"Too challenging and too much work. Every week there are PAs…"*
- *"Group coursework is not necessary…"*

Top university materials: Top students know these.

Industry say:
*better developers think in **sets***

How To Write Better SQL Queries - Karlijn Willems.pdf

Tip the set-based approach of querying is also the one that most top employers in the data s
industry will ask of you to master! You'll often need to switch between these two types of a

*All knowledge built are by **Self-Effort**. Gary cannot brain dump.*

Gary – a coach.
CS-250 – training camp.
Team effort & support.

There is a ***standard***, a ***goalpost***!
like the Himalayas—unmoving and unyielding.

CS-250 uniquely offers:

Motivate Self-Effort
- Responsibility: No spoon-feeding.
- Motivation: Real-world stories before topics.
- Support: Weekly Peer Assessments (PAs) boost CW2/3 – consistent efforts [***incentives!***]
- Flexibility: Self-labs on your schedule.

Innovative Learning Environment
- Goal: Creative, independent problem-solvers.
- Dynamic: Muddiest points, diverse solutions in class.
- Peer Learning: PAs highlight successes, mistakes, tips
- ***Groupwork***: learn and support each other.
- Challenge: Promote critical thinking in CW, exams.

Examinations

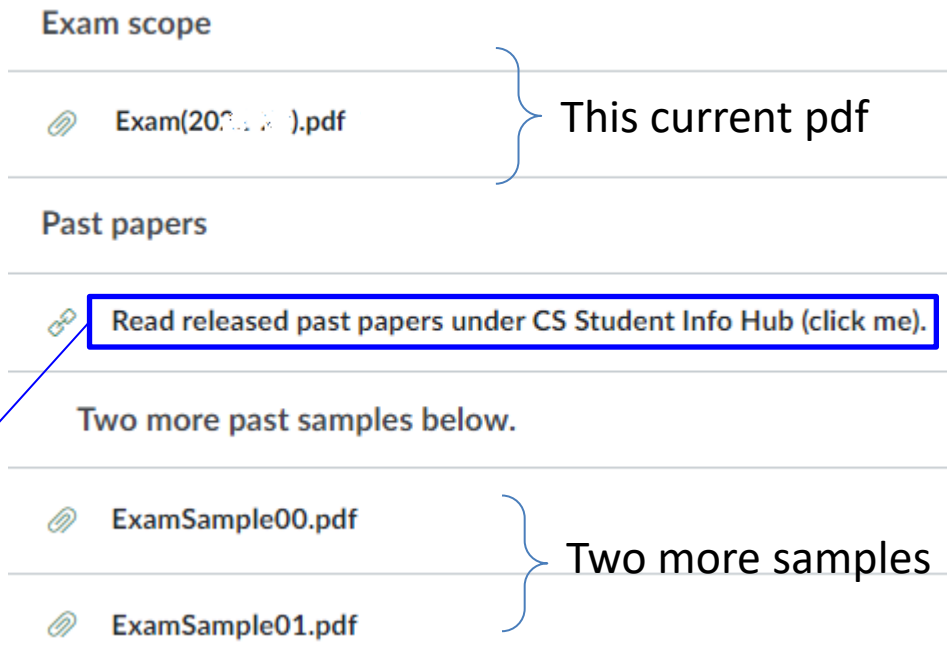
- Good Tips:
  - Some questions are modified/inspired from:
    - past papers
    - tutorial questions
    - lab questions
    - in-class questions/exercises (see lecture notes)
    - student's mistakes in courseworks!
    - Q&A in discussion board!
  - Re-do/read all these, see if you can arrive at the solution.

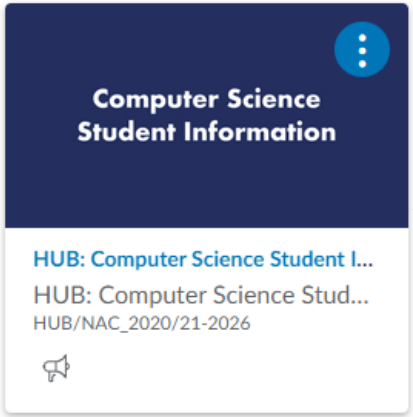
  - You are examined on **applying** your knowledge/skills to **new unseen problem**. Exposure and practice will be useful.

Past Exam Papers

- **Please note:** you do **not** have permission for these exams to be redistributed. You must not post them anywhere else - students should only obtain these from their Canvas account.

Canvas > CS-250 > Modules > Exam Scope and Past Papers





Canvas > CS Student Info Hub > Modules > Past Exam Papers > Level 5 / Year 2

Why Peer Assessments?

- One student told me that s/he has ***NO TIME*** to revise CS-250 exam (due to some extenuating circumstances).
- S/he just went straight into the exam venue without revision.
- S/he however ***has done all peer assessments*** on a weekly basis.
- S/he got ***60%*** in CS-250 final exam.

- 60% is not bad. S/he has internalized many materials during the semester.
- ***Have you done all peer assessments? Feedback to peers?***

- If you revise / practise further, it is not difficult to get higher marks. (e.g., a 70%)

Examinations

- In Jan, you can contact me if you need clarification of materials (but please expect delays):
  - Prepare a list of questions
  - Show your attempts
  - I clarify if there are issues
  - ***No private lecturing/tutoring***

- ***No solutions for past papers (FSE CS Policy)***
- Please do ***not*** send me your solutions. For fairness, I ***will not*** respond. Sorry.
- Also, other things planned in new year, e.g. *family to look after, Grant applications, Paper reviews, preparations, thesis examination.*

Examinations

- Multiple Choices Questions for Past Exams ***are not provided***.
- This is in line with FSE and CS Department policy.
- Observations:
  - Students think MC will be easy. No, they aren't.
  - Good things: No Multiple-Answer type questions.

- ***Top Tips***
  - Learn how to do all the ***handons*** (past papers).
  - And you can answer any questions of whatever types.
  - MC Format is very similar to those in CWs.

Examinations

- You may not be able to answer all past exam questions. No worry.

- Due to time concern, some materials are removed to cater for new materials.
- Examples:
  - Effects of NULL values.
  - Timestamp protocol
  - Indexing: lectures from past years taught *equation* on B-Tree. ***We studied B+-Tree*** (which is used in DBMS).

- We examined on what we taught.
- ***Extra reading*** would help on ***very challenging*** questions.

Examinations

- The following will ***NOT*** be in exam
  - Materials that is specified as “out-of-syllabus” or “non-exam”.
  - RSA cryptography (but good for job interviews)
  - ***PHP*** (CS-250 is ***NOT*** a web-programming course, helpful for job interviews)
- Plan your time and make a study plan.

Examinations

- If you attend my lectures, I often say :
  - Pen & paper, jot down / highlight these…
  - I said: ”this is a very common mistake…”
  - These are very muddiest …
  - Here are the tips (e.g. look across, look downwards, look upwards, remember these 4 steps, what is the keywords for…)
  - Simply reading lecture notes is **NOT** enough.
  - These may appear in exams
- You may find them useful in exam preparation.
- Sometimes your questions in lecture also inspire new exam questions

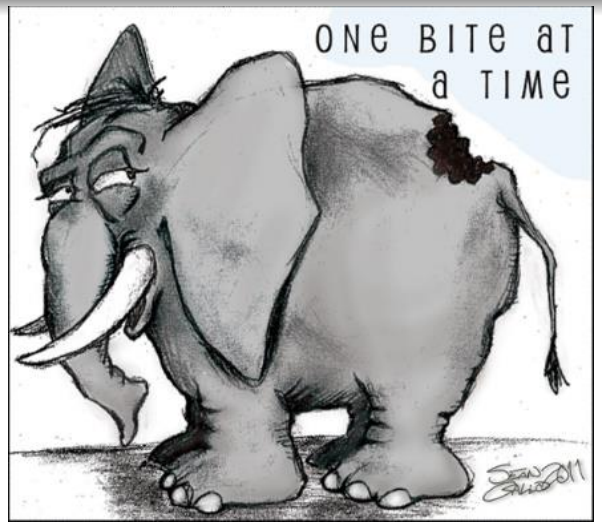
Examinations

- Focus on these topics during your revision:
  - Set Theory ⇔ Relational Calculus ⇔ Algebra ⇔ SQL (DML)
  - ***SQL:*** DDL, DML, DCL
  - Functional Dependencies ⇔ Normalisation
  - Database Conceptual Design: ER diagram ⇔ ER=>Tables
  - Transactions ⇔ Concurrency ⇔ Recovery
  - B+Tree ⇔ Query Optimisation
  - Security, PSI DSS v3
- Strategies
  - Questions will cover all the above ***different*** topics.
  - ***Top tips:*** don't guess topics, don't revise selectively.
  - Revise everything!

⇔ Understanding across different topics

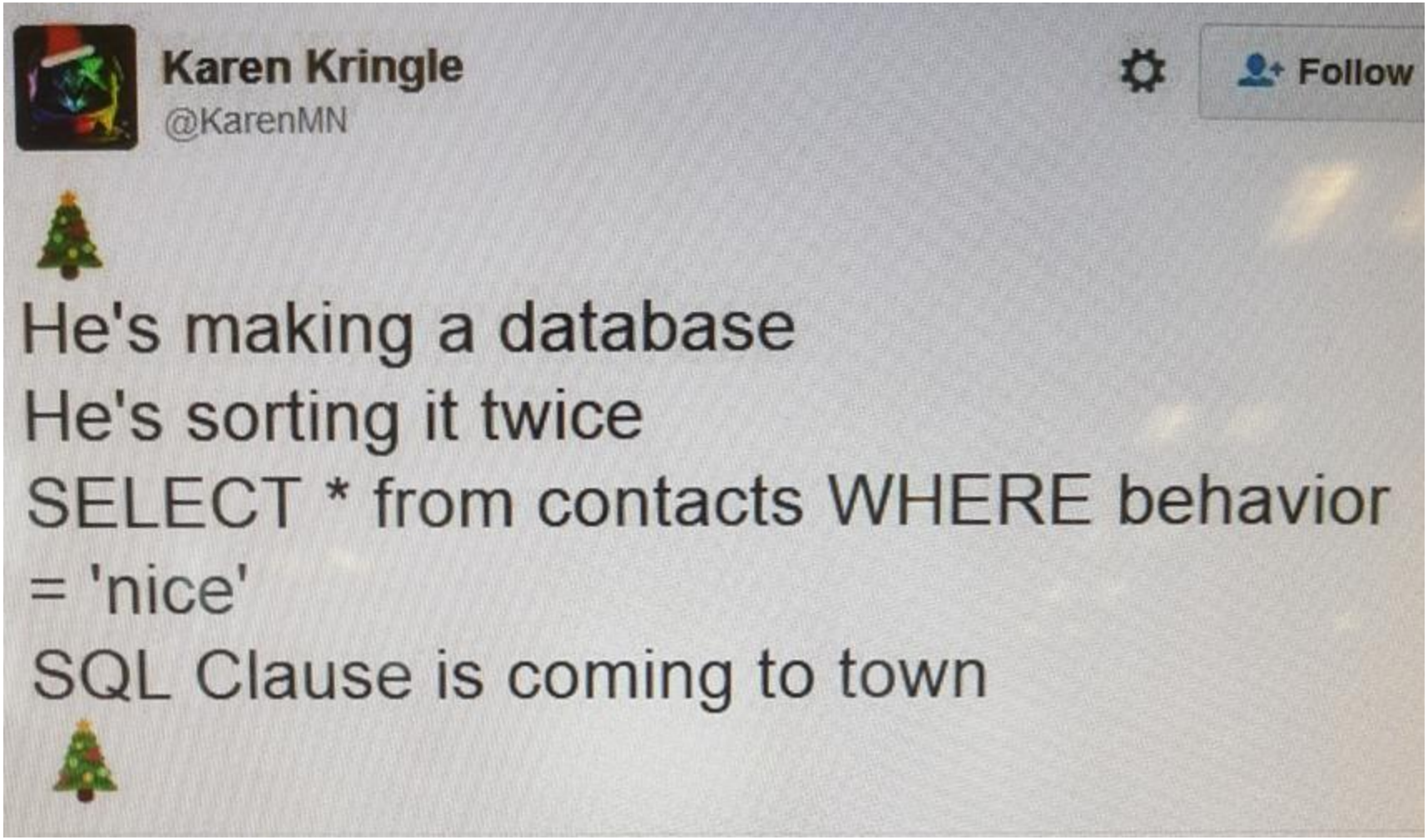
Good luck!

Holiday



- Time Management
  - Exam after holiday
  - Plan ahead your schedule
    - If you work part time…
    - If you stay home, family, TV consoles, read manga …
    - If you go on holiday …
    - If you plan to rest, sleep, or just not to do anything…
- A bit early…

A Christmas SQL Song



From Callum, 2017
From Anya, 2024