BUCKINGHAMSHIRE
NEW UNIVERSITY
EST. 1891

TCA2 Assessment   Academic Year 2022/2023

Module Code and title:	CO558 Database Design	Module tutor:	Kompel Campion
Assignment No/Title:	TCA2 Assessment	Assessment Weighting:	50%
Submission time and date:	25th January 2023 starting @ 14:00.	Feedback Target Date:	15 working days

Assignment format:
This TCA accounts for 50% of the assessment score for this module. Questions do not all have the same number of marks; the marks allocated to each question or question part is indicated. This assessment is intended to allow you to show your understanding of the context of databases, database design and database management. You are required to produce a single word-processed document containing all your answers to the questions in this TCA assessment. This assessment is structured into the following parts: • Part 1 – Structured Query Language (75 marks) • Part 2 – Concurrency control and database recovery (5 marks)

Assignment instructions:

- The database "HR Database" files are available on Blackboard in a MS Access setup version.

- Your answer to each question must include a paste of the query and the output when running the query.

- Marks will be awarded for the query syntax and query output result.

- If you find you have syntax issues when running you query, you should still include a paste of the query but state clearly the syntax issue.

- The answers may be visible through the data, but you are required to write the queries and show the resulting output.

- There are several ways each query can be attempted, providing your output exactly matches the required answer, which is aligned to the question you will receive the full marks.

Database schema:

staff_profiles											
staffNo	LastName	FirstName	Sex	Age	JobTitle	Salary	FTE	WeeklyHours	Start Date	ContractNo
50000	Johnson	Nina	Female	20	Marketing Administrative Assistant	£19,000	1	42	14/05/1980	M0
50001	Young	Teri	Female	24	Marketing Administrative Assistant	£17,000	1	37	26/04/1988	M0
50002	Krauser	Katy	Female	47	Marketing Analyst	£58,764	1	35	25/09/1989	M0
50003	Mcgoffin	Allison	Female	63	Senior Product Analyst	£50,213	1	37	31/10/1990	M1
50004	Puckett	Roger	Male	33	Marketing Administrative Assistant	£15,000	1	40	22/04/1993	M1
50005	Pare	Vicki	Female	19	Marketing Administrator	£22,309	1	40	12/03/2001	M1
50006	Glass	Bria	Intersex	49	Marketing Analyst	£69,274	1	40	21/11/2005	M2
50007	Hazel	Barbara	Female	37	Marketing Administrator	£34,658	1	37	29/01/2008	M2
50008	Sekulich	Connie	Female	51	Marketing Administrator	£31,029	1	37	13/04/2008	M2
50009	Smith	George	Male	29	Marketing Analyst	£63,219	1	40	03/12/2008	M2
50010	Ivanov	Yulia	Female	58	Marketing Consultant	£8,284	0.5	18	19/10/2010	M2
50011	Wan	Liz	Female	33	Marketing Consultant	£34,000	1	37	27/11/2010	M2
50012	Knight	Kevin	Male	64	Senior Product Analyst	£9,187	0.5	18	20/06/2011	M2
50013	Krishnan	Ramya	Female	55	Marketing Administrator	£26,087	1	37	18/12/2012	M2
50014	Mullins	Charles	Male	58	Marketing Executive	£67,432	1	35	30/08/2013	M2
50015	Byrd	Brenda	Female	47	Marketing Analyst	£21,000	1	37	14/10/2013	M2
50016	Lee	Luci	Female	43	Marketing Director	£32,000	1	40	12/03/2014	M2
50017	Mcclain	Mary	Female	64	Marketing Administrator	£40,010	1	37	24/03/2014	M2
50018	Davis	Jack	Male	21	Marketing Consultant	£18,000	1	40	08/04/2014	M2
50019	Jones	Dawn	Female	37	Marketing Consultant	£25,737	1	42	09/06/2014	M2
50020	Goodwin	Andrew	Male	65	Senior Product Analyst	£20,876	1	40	11/06/2014	M2
50021	Venkata	Michael	Male	54	Senior Product Analyst	£30,000	1	40	13/06/2014	M2
50022	Bailey	Henrietta	Female	21	Marketing Analyst	£44,769	1	35	05/08/2014	M2
50023	Wu	Lee	Male	35	Marketing Administrator	£42,776	1	37	29/12/2014	M2
50024	Hawkins	Melissa	Female	39	Senior Product Analyst	£22,114	1	40	29/02/2016	M2
50025	Lewis	Margaret	Female	38	Marketing Analyst	£16,541	1	40	23/05/2016	M2

staffNo	LastName	FirstName	Gender	Age	JobTitle	Salary				
50026	Dwyer	Brenda	Female	36	Marketing Executive	£17,000	1	40	21/07/2016	M2
50027	Wilson	Johnny	Intersex	18	Marketing Administrative Assistant	£5,349	0.2	7	21/07/2016	M2
50028	Hollins	Tara	Female	31	Marketing Administrative Assistant	£90,347	1	48	29/08/2016	M2
50029	Smithson	Betty	Female	45	Marketing Executive	£15,200	0.8	28	15/09/2016	M2
50030	Crawford	Terry	Male	27	Marketing Administrative Assistant	£64,106	1	35	29/09/2016	M2
50031	Stansfield	Rhoda	Female	34	Marketing Consultant	£30,000	1	20	07/12/2016	M2
50032	Takegawa	Hiro	Male	66	Marketing Manager	£16,500	1	40	04/07/2017	M3
50033	O'Donnel	Karen	Female	49	Marketing Analyst	£20,745	1	37	08/09/2017	M3
50034	Patel	Shishank	Male	53	Senior Product Analyst	£30,117	1	42	18/01/2018	M3
50035	Quinn	Lewis	Male	42	Senior Product Manager	£16,435	1	40	27/01/2018	M3
50036	Zafar	Luke	Male	51	Senior Marketing Manager	£16,549	1	40	29/01/2018	M3
50037	Bisson	Tamala	Female	49	Marketing Administrator	£69,000	1	35	02/02/2018	M3
50038	Morton	Harry	Male	22	Marketing Administrative Assistant	£21,000	1	37	23/07/2018	M3
50039	Mills	Tina	Female	30	Product Manager	£32,820	1	42	24/07/2018	M3

staff_contract	
ContractNo	Description
C1	Pre 2005
C2	Post 2005
M0	Pre 1990
M1	1990-2002
M2	2002 - 2016
M3	2016-present

sickness_record				
staffNo	LastName	FirstName	SicknessDays	InstancesOfAbsence
50000	Johnson	Nina	0	0
50001	Young	Teri	3	1
50002	Krauser	Katy	14	3
50003	Mcgoffin	Allison	0	0
50004	Puckett	Roger	5	1
50005	Pare	Vicki	0	0
50006	Glass	Bria	1	1
50007	Hazel	Barbara	0	0
50008	Sekulich	Connie	13	2
50009	Smith	George	0	0
50010	Ivanov	Yulia	0	0
50011	Wan	Liz	0	0
50012	Knight	Kevin	0	0
50013	Krishnan	Ramya	0	0
50014	Mullins	Charles	20	0
50015	Byrd	Brenda	34	2
50016	Lee	Luci	0	0
50017	Mcclain	Mary	2	2
50018	Davis	Jack	0	0
50019	Jones	Dawn	0	0
50020	Goodwin	Andrew	18	2
50021	Venkata	Michael	1	1
50022	Bailey	Henrietta	5	3
50023	Wu	Lee	0	0
50024	Hawkins	Melissa	0	0
50025	Lewis	Margaret	3	1
50026	Dwyer	Brenda	0	0

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50027	Wilson	Johnny	22	3
50028	Hollins	Tara	0	0
50029	Smithson	Betty	5	1
50030	Crawford	Terry	0	0
50031	Stansfield	Rhoda	0	0
50032	Takegawa	Hiro	0	0
50033	O'Donnel	Karen	3	1
50034	Patel	Shishank	51	4
50035	Quinn	Lewis	0	0
50036	Zafar	Luke	0	0
50037	Bisson	Tamala	10	2
50038	Morton	Harry	0	0
50039	Mills	Tina	0	0

Assignment task:

Part 1 – Practical Structured Query Language

Write SQL statements that answer each of the requests for data in the 2022-2023 HR Database tables:

1. How many employees are recorded as working full time? **(2 marks)**

2. How many employees are recorded as having the job title Senior Product Analyst? Label the output Senior Product Analysts. **(3 marks)**

3. Who are the top 3 highest earners in the company? Ensure the results are ordered by greatest earner down to lowest. The resulting output requires the columns, salary, first name and last name. **(4 marks)**

4. For each job title how many staff are recorded? Label the output appropriately and order. **(5 marks)**

5. What is the average age of all the employees? **(2 marks)**

6. For each type of contract how many employees have been assigned? Label the output appropriately. **(7 marks)**

7. What is the lowest and the highest paid salary in the organisation? Label the output result appropriately. **(6 marks)**

8. Which employees have been assigned the M3 contract? The results must include the columns Firstname, Lastname, StartDate, ContractNo and the Contract Description. Also, order the results in chronological order. Hint: A join is required to carry out this query.   **(10 marks)**

9. Which employees earn £20,000 to £30,000? Order the results lowest to highest. **(5 marks)**

10. Which employees (include their full name and staff number) have instances of absence and how many days? Hint: A join is required to carry out this query. **(10 marks)**

11. What is the current total number of sick days in the organisation? **(3 marks)**

12. Which employees are aged 60 and over and are still working full time? **(4 marks)**

13. The company has decided to keep track of all employee's current length of service. Can you write the query that adds the new column Service to the correct table? **(3 marks)**

14. Update the new column Service with each employee's service in years relative to the current date. **(5 marks)**

15. Which employee has the longest service? **(5 marks)**

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Part 2 – Concurrency control and database recovery.

1. You have decided to take a gap year and are working alongside a popular ticket agent who specialises in selling tickets for music events and festivals being held around the UK. You have been working with the agent for some time on the project for developing the new database to manage the tickets. You are almost at the point where the database is due to go live. Although there are some stringent rules for controlling the ticket sales that need further consideration. It is thought that the front-end application process below will follow the sequence:

    -   Process one – ticket availability is checked.
    -   Process two – Ticket is allocated.
    -   Process three - Available tickets updated.

You have been asked by the event manager to consider concurrency control management, because it is believed a problem could occur. Explain why a problem might occur when customer(s) are purchasing tickets? (2 marks) What will happen if concurrency control is not adopted? (1 mark) **(3 marks)**

2. Having considered the concurency management options the event's manager has decided upon an optimistic concurrency approach. The decision has been taken despite your guidence that the system will experience high demand and consequently at peak times be highly loaded, especially for event tickets which are popular and in demand. Why is an optimistic approach not advisable? **(2 marks)**

End of TCA2

Task requirements
Upload your answer document to the submission point indicated on Blackboard.

Submission details
- You are reminded of the University's regulations on academic integrity, which can be viewed on the University website: https://www.bucks.ac.uk/sites/default/files/2021-07/academic-integrity-policy.pdf. In submitting your assignment, you are acknowledging that you have read and understood these regulations   - Please also note that work cannot be submitted after the deadline has passed it is considered a non-submission.

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Before you submit

- Check through your answers and that you have attempted all questions.