School of Computing

ST1501 Data Engineering CA1 AY2024/2025 Semester 1

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| Class | DAAA/03 |

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| a) Database Design (Enhanced Enty Relaonship Diagram) | 40% |
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| b) Database Design (Database Diagram) | 15% |
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| c) Database Creaon | 10% |
| Submit all your table creaon SQL codes in a single file named "create\_tables.sql" |  |

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| d) Queries |  |  |
| Remember to submit all your SQL queries in a single file named "queries.sql" as well | |  |
| Q1 |  | 4% |
| SQL Statement:  -- Qn 1  SELECT  COUNT(CASE WHEN ParentModelID IS NULL THEN 1 END) AS FreshModel,  COUNT(CASE WHEN ParentModelID IS NOT NULL THEN 1 END) AS FinetunedModel   FROM Model; | |  |
| Results: | |  |

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| Q2 | 5% |
| SQL Statement:  -- Qn 2  SELECT  MT.Model\_Type AS ModelType,  UnassignedModels.NumberUnassigned,  CAST(AVG(M.Accuracy) AS DECIMAL(4, 1)) AS MeanAccuracy,  MAX(M.Accuracy) AS MaxAccuracy  FROM  ModelType MT  LEFT JOIN  Model M ON MT.ModelCode = M.ModelCode  LEFT JOIN  (  SELECT  M.ModelCode,  COUNT(M.ModelID) AS NumberUnassigned  FROM  Model M  LEFT JOIN  Solution S ON M.ModelID = S.ModelID  WHERE  S.ModelID IS NULL  GROUP BY  M.ModelCode  ) UnassignedModels ON MT.ModelCode = UnassignedModels.ModelCode  WHERE  UnassignedModels.NumberUnassigned > 0  GROUP BY  MT.Model\_Type,  UnassignedModels.NumberUnassigned  ORDER BY  MT.Model\_Type;  SELECT  MT.Model\_Type AS ModelType,  COUNT(M.ModelID) AS NumberUnassigned,  CAST(AVG(M.Accuracy) AS DECIMAL(3, 1)) AS MeanAccuracy,  MAX(M.Accuracy) AS MaxAccuracy  FROM  ModelType MT  LEFT JOIN  Model M ON MT.ModelCode = M.ModelCode  LEFT JOIN  Solution S ON M.ModelID = S.ModelID  WHERE  S.ModelID IS NULL  GROUP BY  MT.Model\_Type  ORDER BY  MT.Model\_Type; |  |
| Results: |  |

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| Q3 | 4% |
| SQL Statement:  SELECT  CONCAT(e.First\_Name, ' ', e.Last\_Name) AS FullName,  e.Contact,  e.Gender  FROM  Employee e  JOIN  (  SELECT  EmployeeID  FROM  Solution  GROUP BY  EmployeeID, OrderID  HAVING  COUNT(ModelID) > 1  ) AS sub  ON  e.EmployeeID = sub.EmployeeID  ORDER BY  FullName; |  |
| Results: |  |

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| Q4 | 7% |
| SQL Statement:  SELECT COUNT(\*) AS NumberOfAcceptedModels  FROM Solution AS S  JOIN Model AS M ON S.ModelID = M.ModelID  JOIN Orders AS O ON S.OrderID = O.OrderID  JOIN ModelType AS MT ON M.ModelCode = MT.ModelCode  WHERE S.AssignmentDate <= O.Completion\_Date  AND (O.Model\_Type IS NULL  OR MT.Model\_Type IN (SELECT TRIM(value) FROM STRING\_SPLIT(O.Model\_Type, ',')))  AND M.Accuracy >= (CASE WHEN O.ReqAccu = 1 THEN 75 ELSE 0 END); |  |
| Results: |  |