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CS-E4650 Methods of Data Mining -
      v1.20.1
CS-E4650
                                   « 1. Prerequisite test
                                                                                                                   Course materials
Course materials
                                    CS-E4650 / 1. Prerequisite test / 1.1 Quiz
• Your points
                                  Quiz
                                                                                   © Deadline Sunday, 31 December 2023, 12:00
                                                      My submissions 1/2
                                    Points 4/4
                                                                                    ■ To be submitted alone
                                     Probability quiz 1
                                     Let A and B be two events, whose complements are notated by \neg A and \neg B and whose intersection is notated by A \cap B
                                    Given P(A) = 3/10, P(B) = 4/10, P(A \cap B) = 1/10
                                     Question 1 1/1
                                     Calculate P(A \cap \neg B)
                                     Use the decimal point and write three first decimals, for example, 0.375.
                                      0.200
                                     ✓ Correct!
                                     Question 2 1/1
                                     Calculate P(\neg A \cap B)
                                     Use the decimal point and write three first decimals, for example, 0.375
                                      0.300
                                     ✓ Correct!
                                     Question 3 2/2
                                    Calculate P(\neg A \cap \neg B)
                                     Use the decimal point and write three first decimals, for example, 0.375.
                                      0.400
                                     ✓ Correct!
                                      Submit
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                                                      My submissions 1/2 -
                                    Points 6/6
                                                                                    ♣ To be submitted alone
                                     Probability quiz 2
                                     Let's consider n=100 animals, from which 50% rats and 50% mice. 20% of rats are white and 30% of mice are white.
                                     What is proportion on white animals in the entire set?
                                     Question 1 2/2
                                     Use the decimal point and write three first decimals, for example, 0.375.
                                      0.250
                                     ✓ Correct!
                                    Given that: Half of the rats are female and 8 female rats are white.
                                     Question 2 2/2
                                     What is the conditional probability of being white given female rat, P(\text{white}|\text{female rat})?
                                     Use the decimal point and write three first decimals, for example, 0.375.
                                      0.320
                                     ✓ Correct!
                                     Question 3 2/2
                                     What is the conditional probability of being white given male rat, P(\text{white}|\text{male rat})?
                                     Use the decimal point and write three first decimals, for example, 0.375.
                                      0.08
                                     ✓ Correct!
                                      Submit
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                                    Points 5/5
                                                                                    ■ To be submitted alone
                                     Matrix quiz I
                                     Question 1 5/5
                                        Which of the following matrix operations produce matrix C=oxedge 2 \quad 6 \quad 4
                                        Given I is the 3 	imes 3 Identity matrix
                                        and X^T is the transpose of matrix X
                                        and \det X = |X| is the determinant of X
                                         Note that there can be multiple correct answers.
                                    \subseteq ICI
                                     ✓ Correct!
                                      Submit
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                                    Points 5/5
                                                                                    ■ To be submitted alone
                                     Matrix quiz 2
                                     Question 1 5/5
                                    Given \mathbf{A} \in \mathbb{R}^{3 	imes 3} matrix:
                                    \mathbf{A} = egin{bmatrix} 3 & 1 & 2 \ 0 & 2 & 4 \ 0 & 0 & 1 \end{bmatrix}
                                     Determinant of \mathbf{A} - \lambda \mathbf{I} is (3 - \lambda)(2 - \lambda)(1 - \lambda).
                                     Which of the following statements are true regarding eigenvalues and eigenvectors of \mathbf{A}?
                                     Note that there can be multiple correct answers.
                                    \Box A has no eigenvalues
                                    lacksquare 3 is an eigenvalue and [1,0,0]^T the corresponding eigenvector
                                    \square 0 is an eigenvalue and [0,0,0]^T the corresponding eigenvector
                                    \square 2 is an eigenvalue and [-1,-1,-1]^T the corresponding eigenvector
                                    \Box A has only complex eigenvalues
                                     ✓ Correct!
                                      Submit
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                                    Points 6/6
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                                    Graph quiz
                                     Let G be an undirected weighted graph, whose nodes are v_1, v_1, \ldots, v_6 and the adjacency matrix is given below.
                                     Missing edges are marked with weight \infty.
                                     In some questions, you are asked to consider the unweidghed version of G (i.e., only the graph structure, without edge
                                    weights).
                                                               v_4 v_5
                                                                           v_6
                                      v_1
                                                                           \infty
                                      v_2
                                                               \infty
                                                                    \infty
                                      v_5
                                                                    \infty
                                     Question 1 1/1
                                     How many connected components are there in the unweighed version of G?
                                     ✓ Correct!
                                     Question 2 1/1
                                     What is the maximum clique size in the unweighed version of G?
                                     ✓ Correct!
                                     Question 3 1/1
                                     What is the weighed node degree of v2?
                                      6
                                     ✓ Correct!
                                     Question 4 1/1
                                     What is the length of the shortest path from v1 to v3?
                                     ✓ Correct!
                                     Question 5 2/2
                                     How many shortest paths are there between nodes v1 and v2?
                                      2
                                     ✓ Correct!
                                      Submit
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                                    Points 5/5
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                                    Algorithm quiz 1
                                    Question 1 5/5
                                     Let's suppose we have n numerical values. Can you implement an algorithm that finds the median value and whose worst
                                     case time complexity is.
                                     Note that there can be multiple correct answers.
                                    \square O(1)
                                    \subseteq O(n \log n)
                                     \subseteq O(n)
                                    lefta O(n^2)
                                    ☐ I can do it, but I don't know the time complexity
                                    ☐ I cannot do it.
                                    b is the right answer. This is pretty good. And there are more than one correct answers.
                                    c is the right answer. Excellent. Maybe you could explain how you do it? And there are more than one correct answers.
                                    d is the right answer. There are better ways to do this. Maybe you use a slow sorting method? And there are more than
                                    one correct answers.
                                     ✓ Correct!
                                      Submit
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                                    Points 5/5
                                                                                    ■ To be submitted alone
                                    Algorithm quiz 2
                                     Question 1 5/5
                                     Below you can find pseudocode that calculates some measure M between vectors x=(x_1,\ldots,x_n) and
                                    y=(y_1,\ldots,y_n):
                                                                            S_1=0;\ S_2=0;\ S_3=0;\ S_4=0;\ S_5=0;
                                                                            for i = 1 to n
                                                                                 begin
                                                                                      S_1 = S_1 + x_i; \ S_2 = S_2 + y_i;
                                                                                      S_3 = S_3 + x_i y_i;
                                                                                      S_4=S_4+x_i^2;\ S_5=S_5+y_i^2;
                                                                                 end
                                                                            a_1=S_1/n;\ a_2=S_2/n;
                                                                           b_1 = \sqrt{S_4 - n \cdot a_1^2}; \; b_2 = \sqrt{S_5 - n \cdot a_2^2};
                                                                           output\ M = rac{S_3 - n \cdot a_1 \cdot a_2}{b_1 \cdot b_2};
                                    What is measure M? The mean values of x_i and y_i are notated by \overline{x} and \overline{y}.
                                    \bigcirc M(x,y) = rac{1}{n} \sum_{i=1}^n (x_i - \overline{x})(y_i - \overline{y})
                                    m{\Phi}(M(x,y) = rac{\sum_{i=1}^{n} x_i y_i - n \overline{x} \overline{y}}{\sqrt{\sum_{i=1}^{n} x_i^2 - n \overline{x}^2} \sqrt{\sum_{i=1}^{n} y_i^2 - n \overline{y}^2}}
                                    M(x,y)=rac{\sqrt{\sum_{i=1}^n x_i^2-n\overline{x}^2}\sqrt{\sum_{i=1}^n y_i^2-n\overline{y}^2}}{\sum_{i=1}^n x_iy_i-n\overline{xy}}
                                    M(x,y) = rac{\sum_{i=1}^n x_i y_i - n \sum_{i=1}^n x_i \sum_{i=1}^n y_i}{\sqrt{(n-\sum_{i=1}^n x_i^2)(n-\sum_{i=1}^n y_i^2)}}
                                     ✓ Correct!
                                      Submit
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                                                      My submissions 2/2
                                    Points 2/5
                                                                                    ■ To be submitted alone
                                       A You have used the allowed amount of submissions for this assignment.
                                    Statistic quiz 1
                                     Suppose we have three numerical variables, A, B, C, and the data matrix consist of three data points
                                     (vectors) (3, 1, 4), (2, 3, 1) and (1, 2, 1).
                                     Question 1 1/1
                                    What is the mean vector?
                                     Write your vector in this format 123.
                                      222
                                     ✓ Correct!
                                     Question 2 1/1
                                     What is the median vector?
                                     Write your vector in this format 123.
                                      221
                                     ✓ Correct!
                                     Question 3 0/1
                                     What is variance of variable A? Use the unbiased estimator of sample variance.
                                     Use the decimal point and write three first decimals, for example, 0.375.
                                      0.000
                                     Wrong answer.
                                     X Incorrect
                                     Question 4 0/2
                                     What is covariance between B and C? Use the unbiased estimator of sample covariance.
                                     Use the decimal point and write three first decimals, for example, 0.375.
                                      0.500
                                     Wrong answer.
                                     X Incorrect
                                      Submit
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                                    Points 5/5
                                                                                    ■ To be submitted alone
                                    Statistic quiz 2
                                     Question 1 5/5
                                     A new drug for a disease was evaluated experimentally and recovery rates in two groups (new drug vs.~no drug) were
                                     compared.
                                    The chi^2 test of independence was performed with the null hypothesis that the drug has no effect on recovery.
                                    The p-value of the test was 0.04.
                                    What does this mean?
                                     Note that there can be multiple correct answers.
                                    ☐ Probability that the drug increases recovery rate is 96%
                                    □ Probability that the drug either increases or decreases the recovery rate is 96%.
                                        There is 4% probability to observe such a high or higher chi^2 value by chance, if the drug has no effect.
                                    □ Probability that there is no association between the drug and recovery is 4%.
                                    □ Probability that there is no association between the drug and recovery is 96%.
                                    c is the right answer.
                                      Submit
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                                    Points 5/5
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                                    Computer literacy quiz
                                     Question 1 5/5
                                     Let data.csv be a csv formatted data file with n=1000 rows and numerical features A,B,C,\ldots
                                     Which of the following tasks you can do in 5 minutes or less?
                                     Note that there can be multiple correct answers.
                                        Look if feature {\cal C} contains missing values (marked as empty)
                                        Change the field separator to #
                                    lacksquare Sort rows to ascending order by their B value
                                        Calculate all pairwise Pearson correlation coefficients between features
                                     leftilde Visualize a scatterplot of A and B
                                     ✓ Correct!
                                      Submit
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