

补充题

线性变换

判断: ① 互相表示

- ② 方程组相容/方程
③ 行列式是否为零

1. (1 2 4; 1 3 9) -> (1 1 1; 0 1 1) lambda 不为0 无解

求取反个双 = 方程个双 = 相乘

2. alpha_1 * alpha_2 - alpha_3 * alpha_4, alpha_1 = lambda * alpha_2 + ... + lambda_n * alpha_n + ...

3. alpha_1, ..., alpha_n 线性无关, alpha_1, ..., alpha_n 线性相关, 则由 alpha_1, ..., alpha_n 相乘 lambda_1 * alpha_1 + ... + lambda_n * alpha_n = 0

4. beta 可用 alpha_1, ..., alpha_n 线性表示, 则 beta 可由 alpha_1, ..., alpha_n 的极大无关组表示

5. alpha_1, ..., alpha_r 秩为 r, 求证: alpha_1, ..., alpha_r 中任意 r 个线性无关, 任意 r+1 个线性相关

6. 向量组 alpha_1, ..., alpha_n 的极大无关组为 alpha_1, ..., alpha_r

alpha_1, ..., alpha_s, beta_1, ..., beta_t, V alpha_i = alpha_i, alpha_j = lambda_1 beta_1 + ... + lambda_t beta_t

7. alpha_1 = (1, 0, 1, 0, 0), alpha_2 = (0, 1, 0, 1, 0) 是 R^5 的基

8. alpha_1 = (1, 1, 1, 1), alpha_2 = (0, 1, -1, -1), alpha_3 = (0, 0, 1, 1), alpha_4 = (0, 0, 0, 0)

9. x_1 = (1, 2, 3, 4, 5), x_2 = (1, -1, -1, 1, 1), x_3 = (0, 2, 4, 8, 16)

10. S 与 T 等价 => rank S = rank SUT = rank T

11. rank S = rank SUT = rank T => S, T 等价

12. x_1 = (1; 1; 1; 1; 1), x_2 = (1/2; 3/2; 5/2; 7/2; 9/2), x_3 = (1; 0; -1; -2; -3)

13. A(alpha_1, alpha_2, alpha_3) = (alpha_1, alpha_2, alpha_3) * A

坐标变换

1. P^{-1}D = (alpha_1, alpha_2, ..., alpha_n)^{-1} * A * (alpha_1, alpha_2, ..., alpha_n)

2. A(alpha_1, alpha_2) = (alpha_1, alpha_2) * (2 -1; 1 0) = (alpha_1, alpha_2) * P^{-1} * D * P

3. P^{-1}A = (1 0; 0 2) = P^{-1} * A * P, A = P * P^{-1} * A * P^{-1} * P

4. P^{-1}A = (1 0; 0 2) = P^{-1} * A * P, A = P * P^{-1} * A * P^{-1} * P

5. P^{-1}A = (1 0; 0 2) = P^{-1} * A * P, A = P * P^{-1} * A * P^{-1} * P

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19. P^{-1}A = (1 0; 0 2) = P^{-1} * A * P, A = P * P^{-1} * A * P^{-1} * P

20. P^{-1}A = (1 0; 0 2) = P^{-1} * A * P, A = P * P^{-1} * A * P^{-1} * P

相似与对偶

1. A = (1 2 3; 0 1 0; 0 0 1), B = (1 2 0; 0 1 3; 0 0 1)

2. rank A = 3, rank B = 3, lambda = 1, mu = 2

3. lambda = 2, mu = 1, rank A = 2, rank B = 2

4. lambda = 1, mu = 2, rank A = 2, rank B = 2

5. lambda = 2, mu = 1, rank A = 2, rank B = 2

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特征值与特征向量

1. A = (1 1 1; 0 0 1; 0 0 2)

2. A = (1 1 1; 0 0 1; 0 0 2), lambda = 1, mu = 2

3. A = (1 1 1; 0 0 1; 0 0 2), lambda = 1, mu = 2

4. A = (1 1 1; 0 0 1; 0 0 2), lambda = 1, mu = 2

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17. A = (1 1 1; 0 0 1; 0 0 2), lambda = 1, mu = 2

18. A = (1 1 1; 0 0 1; 0 0 2), lambda = 1, mu = 2

19. A = (1 1 1; 0 0 1; 0 0 2), lambda = 1, mu = 2

20. A = (1 1 1; 0 0 1; 0 0 2), lambda = 1, mu = 2

欧氏空间

1. 如果 A, B 都是正交矩阵, 且 det A = -det B, 求 det(A+B)

2. 求 det(A+B), det(A-B), det(A+B), det(A-B)

3. 求 det(A+B), det(A-B), det(A+B), det(A-B)

4. 求 det(A+B), det(A-B), det(A+B), det(A-B)

5. 求 det(A+B), det(A-B), det(A+B), det(A-B)

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