

HW0, Q1: Probability

- ▶ A bag had three balls in it, two red and one blue. Alice randomly picked a ball from the bag and then checked its color. Now Bob asked Alice: “What is the color of your ball?” Alice told him: “I will flip two normal coins. I will raise my left hand if I get two heads and my ball is red or if I get at least one tail and my ball is blue. Otherwise, will raise my right hand.” Bob saw Alice raised her right hand. What is the probability that Alice’s ball is blue (up to two digits after decimal point)?

HW0, Q2: Linear Algebra

- ▶ What is the largest eigenvalue of $\begin{bmatrix} 1 & -3 & 3 \\ 0 & -5 & 6 \\ 0 & -3 & 4 \end{bmatrix}$?
- (accuracy up to one digit after decimal point)

HW0, Q3: Linear Algebra

- ▶ Are the following vectors linearly independent?

$$\left[1, 1, 0, 0\right], \left[1, \frac{1}{2}, \frac{1}{2}, 0\right], \left[0, 1, 1, 0\right], \left[0, \frac{1}{3}, \frac{1}{3}, \frac{1}{3}\right]$$

HW0, Q4: Calculus

- ▶ $f(x)$ is a function that is 4-times differentiable, what is a good quadratic approximation of the value of $f(x_0 + 0.01)$ based on Taylor's theorem? Fill in the blanks (a_i and b_i) below (up to 5 digits after decimal point)
- ▶ $f(x_0 + 0.01) \approx [a_1]f(x_0 + [b_1]) + [a_2]f'(x_0 + [b_2]) + [a_3]f''(x_0 + [b_3])$

HW0, Q5: Basic Math

- ▶ What is the maximum value of $x + y$ if (x, y) is a point on the ellipse $x^2 + 3y^2 = 1$ (up to two digits after decimal point)?

HW0, Q6: Logistics

- ▶ Do you understand the academic integrity rules?
 - ▶ A: Yes
 - ▶ B: No

HW0, Q7: Logistics

- ▶ What is the expected number of hours a student in 08-737 should spend in the course project every week?

HW0, Q8: Grading Rubrics and Course Project

- ▶ What is the minimum number of pages a full project report is expected to have in LNCS format?

HW0, Q9: Propose Course Project Topic

- ▶ Provide a course project topic other than the suggested ones, describe it in 100-300 words, and a list of references if any (Note: The project idea is not necessarily proposed for yourself. This is just a brainstorming exercise.)