Pre-test for DTU course 22525 – "Medical Image Analysis"

Please take some time to fill out the questionnaire below. It is meant as feedback to the teacher only (you will not be scored!), in order to help him assess this class's existing knowledge, motivation and expectations. The results will be very useful to adjust the lectures to this specific class. Thank you!

1. If a vector $\mathbf{v}$ is defined as follows:

$$\mathbf{v} = \begin{pmatrix} 1 \\ 2 \end{pmatrix},$$

then what is its transpose $\mathbf{v}^{\mathrm{T}}$?

Answer: v = (1, 2) ☐ I don't know

2. If a matrix $\mathbf{A}$ and a vector $\mathbf{v}$ are defined as follows:

$$\mathbf{A} = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} \quad \text{and} \quad \mathbf{v} = \begin{pmatrix} 1 \\ 2 \end{pmatrix},$$

then what is their product $\mathbf{A}\mathbf{v}$?

Answer: Av = (5;11) ☐ I don't know

3. If a function $f(x)$ is defined as follows:

$$f(x) = (x-2)^2 + (x-8)^2,$$

then what is its derivative

$$\frac{df}{dx}(x)?$$

Answer: = -20 + 4x ☐ I don't know

4. What is the minimum of the function $f(x)$ defined above? Why?

Answer: f'(x) = -20+4x = 0 -> x = 5. f(5) = 6 ☐ I don't know

Firstly we have find the x where the slope is 0, we do this with differentials -20+4x = 0 and solve for x then we plug the x =5 into our original function to find the minimum value of f(x).

5. Imagine a country where the following weather observations have been collected:

- 50% of the time the sun shines and the weather is dry
- 20% of the time the sun doesn't shine but the weather is dry
- 20% of the time the sun doesn't shine and it rains
- 10% of the time the sun shines but it rains.

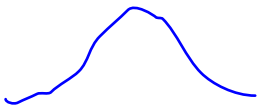
How many days per year does it rain in that country?

Answer: 109.5 ☐ I don't know

6. If a friend calls you from the aforementioned country and tells you that it is raining, then what is the probability that the sun is shining there?

Answer: 33.3 % ☐ I don't know

7. Please draw a Gaussian probability distribution:

Answer:  ☐ I don't know

8. Have you taken a course before in image analysis or image processing?

Answer: ☐ Yes ☐ No

9. Have you taken a course before in machine learning and/or data modeling?

Answer: ☐ Yes ☐ No

10. Do you have any prior knowledge about medical imaging techniques?

Answer: ☐ Yes ☐ No

11. Do you have prior experience in Python?

Answer: ☐ Yes ☐ No