Week 3 Quiz

TOTAL POINTS 8

1. Let $f(x)$ be the probability that a person with feature x dies within 5 years.

   Let $S_x(t)$ be the survival function of a person with feature x. Assume t is measured in years.

   Which of the following is true?

   ○ f(x) = S_x(0)

   ● f(x) = 1-S_x(5)

   ○ $f(x) = S_x(5)$

2. The survival function is always:

   1 point

   ○ Increasing

   ○ Linear

   ● Decreasing

3. Which of the following is a difference between survival data and classification datasets?

   1 point

   ○ Classification dataset contain information on other features

● In survival data the labels are amounts of time and in classification data the labels are binary

○ Survival data can be used to build prognostic models

4. Which of the following is an example of censoring?

1 point

☑ The patient withdraws from a study before having an event, and before the study ends.

☑ Patient does not have the event by the end of the study period.

☑ Death due to other, unrelated causes (such as an automobile accident)

5. Estimate $P(T > 2 | T >= 2)$ from the following dataset:

1 point

i	T_i
1	3
2	5
3	4+
4	2

Hint: $P(T > 2 | T >= 2) = (1 - P(T = 2 | T >= 2))$.

○ 0

○ 1/2

○ 1/4

◉ 3/4

6. Compute the probability of surviving up to 4 years $S(4)$ given the following dataset using the Kaplan Meier estimate:

i	T_i
1	3
2	5
3	4+
4	2

The Kaplan Meier Estimator is

$$S(t) = \prod_{i=0}^{N} \left(1 - \frac{d_i}{n_i}\right)$$

○ 3/4

○ 0

○ 1/4

◉ 1/2

7. Compute S(5) given the following dataset using the Kaplan Meier estimate (note, it's the same dataset as in the previous question).

i	T_i
1	3
2	5
3	4+
4	2

The Kaplan Meier Estimator is

$$S(t) = \prod_{i=0}^{N} \left(1 - \frac{d_i}{n_i}\right)$$

Hint: since we're using the same dataset as in the previous question, you may notice that

$$S(5) = S(4) \times \left(\frac{d_5}{n_5}\right)$$

○ 1/2

● 0

○ 3/4

○ 1/4

8. True or False: If t is larger than the longest survival time recorded in the dataset, then $S(t) = 0$ according to the Kaplan-Meier estimate.

1 point

The Kaplan Meier Estimator is

$$S(t) = \prod_{i=0}^{N} \left(1 - \frac{d_i}{n_i}\right)$$

- ◉ False
- ○ True