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2. KS and KL Tests

The problems on this page concern the data set

$$S = \{0.28, 0.2, 0.01, 0.80, 0.1\}.$$

Let x_i denote the i'th element of the data set S.

The Empirical CDF

3/3 points (graded)

Let $F_5(t)$ denote the empirical cdf of the data set above.

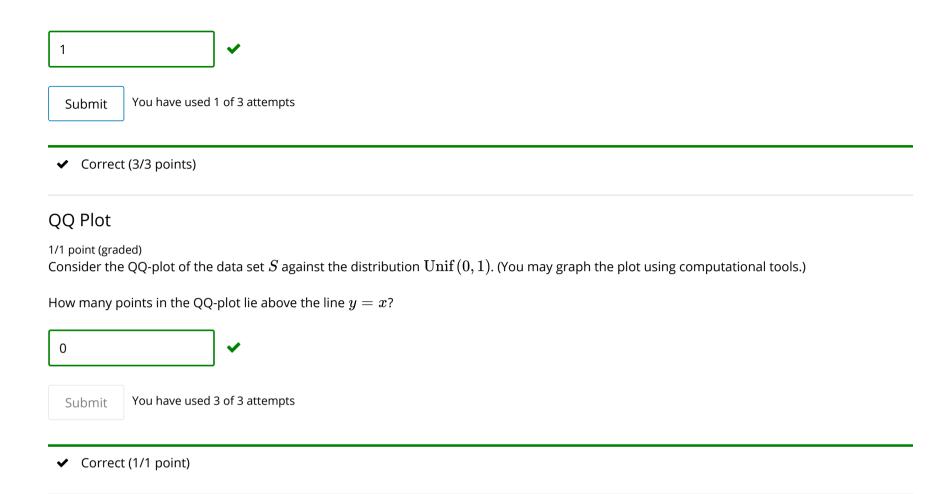
What is F(0.5)?



What is F(0.1)?



What is F(1)?



KS Test Statistic

2/2 points (graded)

In this problem, you will test the null and alternative hypotheses

 H_0 = the data set is distributed as Unif (0,1)

 H_1 = the data set is not distributed as Unif (0,1).

What is the value of the Kolmogorov-Smirnov test statistic on the data set S? Enter $T_5^{\mathrm{KS}}/\sqrt{5}$, the KS statistic without the factor of \sqrt{n} , below.

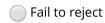
$$T_5^{
m KS}/\sqrt{5}=$$
 0.52

Does this test **reject** or **fail to reject** at level lpha=0.1?

Kolmogorov-Smirnov Tables

<u>Show</u>







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You have used 1 of 3 attempts

✓ Correct (2/2 points)

KL Test Statistic

2/2 points (graded)

What is the sample mean $\hat{\mu}$ of the data set S?

$$\hat{\mu}=$$
 0.278

What is the sample variance $\widehat{\sigma^2}$ of the data set S? (You may use either the unbiased sample variance or the MLE of the variance.)

$$\widehat{\sigma^2} = \boxed{0.076416}$$

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You have used 1 of 3 attempts

✓ Correct (2/2 points)

KL Test Statistic

2/2 points (graded)

In this problem, you will consider the following null and alternative hypotheses.

 H_0 = the data set is distributed as a Gaussian distribution (for some choice of mean and variance)

 H_1 = the data set is not distributed as a Gaussian (for any choice of mean and variance).

What is the Kolmogorov-Lilliefors test statistic evaluated on the data set S? Enter $T_5^{\mathrm{KL}}/\sqrt{5}$, the KL statistic without the factor of \sqrt{n} , below. (You are encouraged to use computational tools.)

Kolmogorov-Lilliefors Tables

<u>Show</u>

$$T_5^{
m KL}/\sqrt{5} =$$

0.29741839452455765



Do you **reject** or **fail to reject** H_0 at level lpha=0.1 on the data set S?

- Reject
- Fail to reject



Submit

You have used 2 of 3 attempts

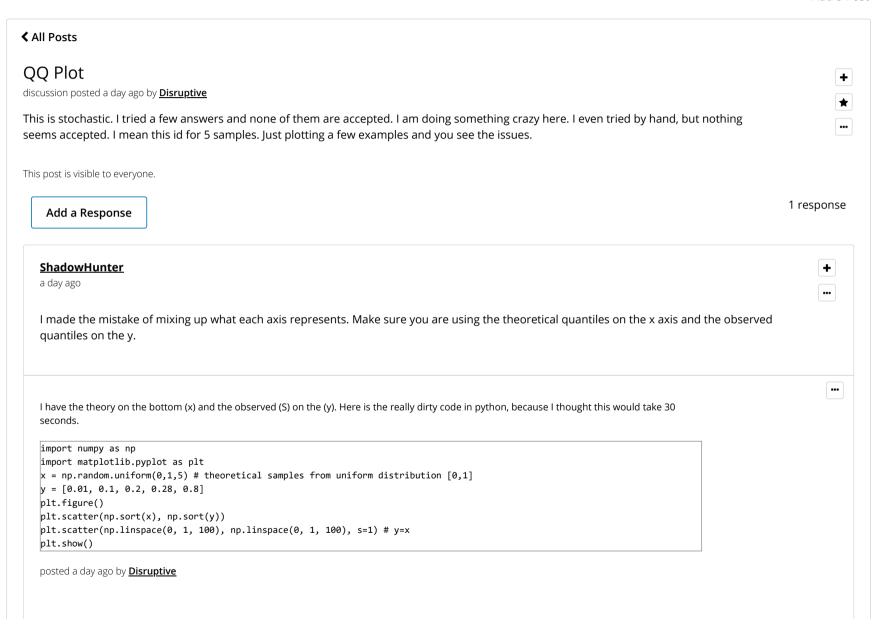
✓ Correct (2/2 points)

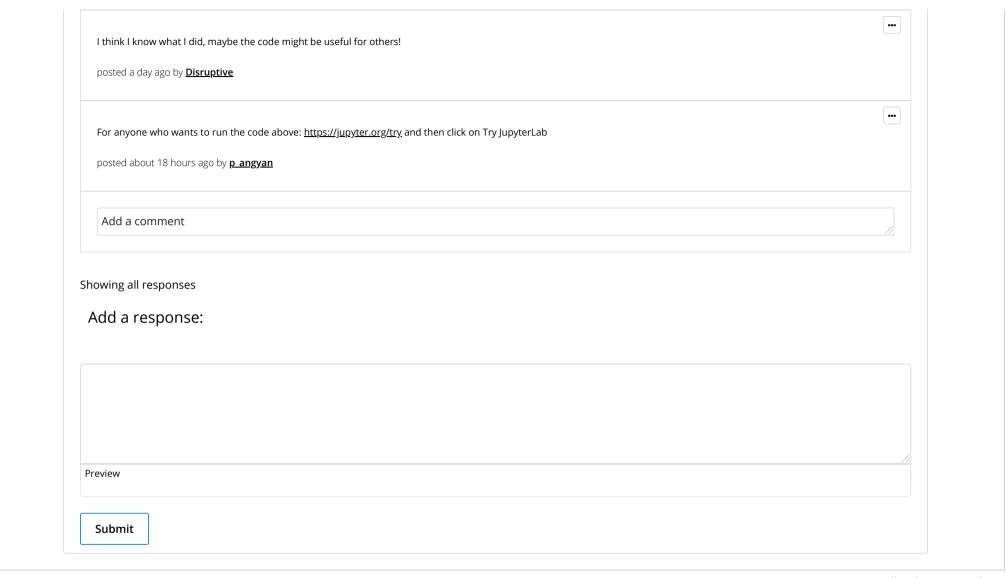
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