

ECE 341 - Homework #10

Testing with Normal Distributions. Due Thursday, June 3rd

Please make the subject "ECE 341 HW#10" if submitting homework electronically to Jacob_Glower@yahoo.com (or on blackboard)

The high and low for the month has been measured at Hector Airport since 1942.

Month	May	June	July	Aug	Sept	Oct
Mean	87.88	91.88	94.64	94.6	89.56	79.46
st dev	4.57	4.41	4.02	4.62	5.66	6.82

Monthly Highs (degrees F): http://www.bisonacademy.com/ECE111/Code/Fargo_Weather_Monthly_High.txt

Highs:

1) What is the 90% confidence interval for the high in June?

From StatTrek, 5% tails corresponds to a z-score of 1.645

$$\mu - 1.645\sigma < \text{high} < \mu + 1.645\sigma$$

$$84.62F < \text{high} < 99.13 \quad p = 0.9$$

It is 90% likely that the high for the month of June will be in the interval (84.6F, 99.1F)

2) What is the probability that it will break 100F in June?

The z-score is

$$z = \left(\frac{91.88 - 100}{4.41} \right) = -1.841$$

$$p = 0.033 \quad \text{from StatTrek}$$

There is 3.3% chance it will break 100F this June

3) Skip (we cover this when we get to t-distributions)

Lows:

Month	May	June	July	Aug	Sept	Oct
Mean	27.35	40.34	46.36	43.3	30.54	19.1
st dev	4.41	4.11	3.97	4.16	4.77	5.53

4) What is the 99% confidence interval for the low in June?

From StatTrek, 0.5% tails corresponds to a z-score of 2.576

$$\mu - 2.576\sigma < low < \mu + 2.576\sigma$$

$$29.75F < low < 50.927F$$

It is 99.9% likely that the low for the month of June will be in the range of (29.74F, 50.927F)

5) What is the probability that it get colder than 32F in June?

The z-score for 32F is

$$z = \left(\frac{32 - 40.34}{4.11} \right) = -2.0292$$

From StatTrek, the corresponds to a probability of 0.021

There is a 2.1% chance that it will freeze in June

6) skip