

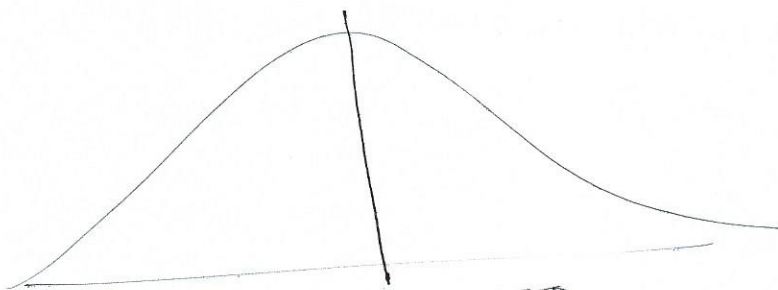
04/24/2019

①

$$H_0: \mu = 30000$$

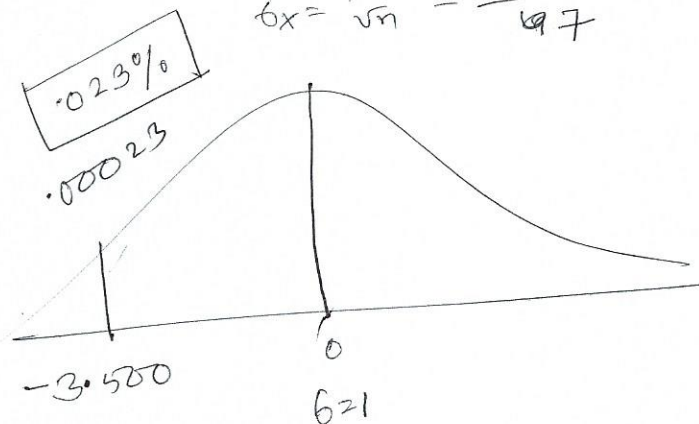
$$H_a: \mu < 30000$$

$n = 49$, since $n > 30$, sampling distribution is normal.



$$\mu_x = 30000$$

$$\sigma_x = \frac{\sigma}{\sqrt{n}} = \frac{1000}{49} = 142.85$$



$$Z = \frac{\bar{x} - \mu}{\frac{\sigma}{\sqrt{n}}} = \frac{29500 - 30000}{142.85} = \frac{-500}{142.85} = -3.500$$

Question: How unusual must the sample mean be to reject H_0 ?

People agree that if an event happens $< 5\% = \alpha$ (level of significance) of the time, it's unusual enough to suggest that H_0 is wrong.

Example:

H_0 : suspect is not guilty.

H_1 : suspect is not not guilty.

Find suspect not guilty when actually not guilty.

Find suspect guilty when actually ~~not~~ guilty.

" " " when " not guilty.

" " not guilty " " are guilty.

2. $n=100$ $df = 100 - 1 = 99$

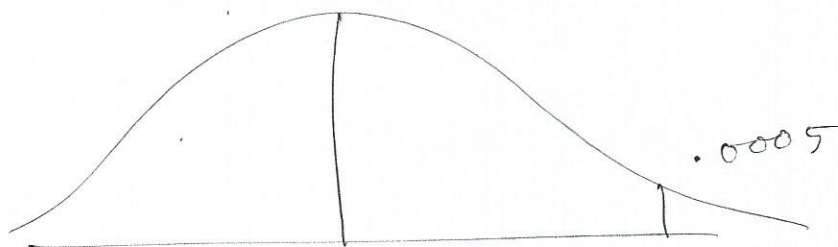
$$\bar{x} = 245$$

$$s = 5$$

$$H_0: \mu = 240$$

$$H_1: \mu > 240$$

$$t = \frac{\bar{x} - \mu}{s/\sqrt{n}} = \frac{245 - 240}{5/\sqrt{100}} = \frac{5}{1/2} = 10$$



p-value < 0.05 .

so, Reject the H_0 .

$$3. H_0: \mu = 1/2$$

$$H_1: \mu \neq 1/2$$

$$n = 500$$

$$\bar{x} = .55$$

$$s = .05$$

$$t = \frac{\bar{x} - \mu}{s/\sqrt{n}} = \frac{.55 - .50}{.05/\sqrt{500}} \approx 22$$

~~type~~ happens less than 0.05

reject H_0

what if $\bar{x} = .55$ but $n = 40$?

$$t = \frac{\bar{x} - \mu}{s/\sqrt{n}} = \frac{.55 - .5}{.05/\sqrt{40}} \approx 6$$



Worksheet on Normal Distributions 2

24 March 2019

Example

The weights of newborn baby boys born at a local hospital are believed to have a normal distribution with an average weight of 7.25 lb and a standard deviation of 1 lb. If a newborn baby boy, born at the local hospital, is randomly selected, answer the following questions.

1. Find the probability that the weight of the newborn baby boy will be more than 8 lb.
2. Find the probability that the weight of the newborn baby boy will be less than 6 lb.
3. Find the probability that the weight of the newborn baby boy will be between 6.5 lb and 8.5 lb.
4. If babies in the lowest 10% of weights are kept for observation, would a baby that weighed 5 lb be kept for observation?
5. What is the weight of a baby in the 95th percentile?
6. What is the weight of a baby in the 15th percentile?
7. Between what weights do 50% of the babies weigh?

Example

According to the 2011 Statistical Abstract of the US, 20.5% of the scores on the critical reasoning portion of the SAT Reasoning Test exceeded 600. Approximately 17.4% of the scores were less than 400 according to the same reference. Assuming the scores on that portion of the SAT are approximately normally distributed, what are the mean and the standard deviation of scores on the critical reasoning portion of the SAT?

Page 1

The first part of the paper discusses the general theory of the model. It is shown that the model is well-posed and that the solution is unique. The second part of the paper discusses the numerical solution of the model. It is shown that the numerical solution is stable and that the error is of order $O(\Delta t^2)$. The third part of the paper discusses the application of the model to the study of the dynamics of the system. It is shown that the model can be used to study the dynamics of the system and that the results are in good agreement with the experimental data.

Page 2

According to the theory of the model, the system is well-posed and the solution is unique. The numerical solution of the model is stable and the error is of order $O(\Delta t^2)$. The application of the model to the study of the dynamics of the system shows that the model can be used to study the dynamics of the system and that the results are in good agreement with the experimental data.