

Statistical Analysis I (STAT-1301)
Practice Problems with Solutions
Chapter 6

[Question 1]

A nurse supervisor has found that staff nurses complete a certain task with a mean of 10 minutes and a standard deviation of 2 minutes. The times required to complete the task are approximately normally distributed.

- a) What is the median of the distribution?
- b) Find the probability that a nurse completes the task in less than 4 minutes.
- c) Find the probability that a nurse requires more than 11 minutes to complete the task.
- d) The nurse supervisor plans to set up observation conditions for the slowest 5 % nurses. What time should the supervisor nurse choose for the cut off separating the slowest 5% from the others?

[Question 2]

The GMAT scores of all examinees who took that test this year produce a distribution that is approximately normal with a mean of 420 and a standard deviation of 32.

- a) Find the probability that the score of a randomly selected examinee is within 2.5 of the population standard deviation.
- b) What is the minimum score that an examinee must get so that his/her score belongs to the top 10% scores.
- c) What are the mode and the median of the distribution?

[Question 3]

The amount of time taken by a bank teller to serve a randomly selected customer has a normal distribution with a mean of 2 minutes and a standard deviation of 0.5 minutes.

- a) Find the probability that a randomly selected customer will take more than 2.5 minutes to be served.
- b) Find the probability that a randomly selected customer will take more than 1 minute and less than 2.5 minutes to be served.

- c) Find the probability that a randomly selected customer will be served within 1.5 standard deviation of the population mean.
- d) Find the probability that a randomly selected customer will be served within 3 minutes of the population mean.
- e) What percent of customers are served in less than 3 minutes?
- f) Find the median of this distribution.
- g) Find the first quartile of this distribution.
- h) Find the 80th percentile of the probability distribution.
- i) Find the probability that both of two randomly selected customers will take less than 3 minutes each to be served.

[Question 4]

The management of a supermarket wants to adopt a new promotional policy of giving a free gift to every customer who spends more than a certain amount per visit at this supermarket. The expectation of the management is that after this promotional policy is advertised, the expenditures for all customers at this supermarket will be normally distributed with a mean of \$115 and a standard deviation of \$26. If the management wants to give free gifts to at most 13.35% of the customers, what should the amount be above which a customer would receive a free gift?