

Stat 160 MidTerm Exam
Spring 2009
March 12, 2009
Form A

There are 25 problems. Select the best answer to each problem.

The next 5 questions refer to the following situation. Jim is interested whether or not his golf lessons have improved his driving distance. He takes a random sample of 22 shots. The data is summarized below in a stem and leaf plot.

```
20|4 5 6
21|0 1 4 8
22|1 2 6 7 9
23|0 8 9
24|3 6
25|2 8
26|5
27|1
28|8
```

Note: 20|4 = 204

1. What is the shape of the distribution?
 - a) Left Skewed
 - b) X Right Skewed
 - c) Bi-Modal
 - d) Symmetric
2. What is Jim's median driving distance?
 - a) 227
 - b) X 228
 - c) 230
 - d) 229
3. What are the range and IQR, respectively?
 - a) 32, 45
 - b) X 84, 32
 - c) 84, 41
 - d) 228, 84
4. For what value would an observation have to be larger than to be an outlier (i.e. the upper inner fence)?
 - a) 288
 - b) 278
 - c) 168
 - d) X 294

5. If Jim's best drive was 349 instead of 288, which statistic would change?
- a) IQR
 - b) X Mean
 - c) Hodges-Lehmann Estimate
 - d) Median

The next 3 questions refer to the following situation. Ted Williams is the last major league baseball player to have a batting average over .400 for a single season. His average was .406 in 1941. A player's batting average represents the probability of getting a hit during a single at-bat. Suppose that Ted had played 1 more game during the 1941 season and had 5 at-bats during that game. Also assume that the result of each at-bat is independent of one another. Use the following output to answer the following questions.

CUMULATIVE BINOMIAL DISTRIBUTION: $\text{pbinom}(2,5,.406) = 0.6721$
BINOMIAL PROBABILITY: $\text{dbinom}(0,5,.406) = 0.0739$

6. What is the probability that Ted gets more than 2 hits and increases his average?
- a) 0.3455
 - b) 0.6545
 - c) 0.6721
 - d) X 0.3279
7. What is the probability that Ted doesn't get a single hit?
- a) X 0.0739
 - b) 0.9261
 - c) 0.9890
 - d) 0.0110
8. What is Ted's expected number of hits during this game?
- a) 2.5
 - b) 1.098
 - c) X 2.03
 - d) 1.206

The next 3 questions refer the following situation. A spinner has sections numbered 1 through 5 with the following probabilities: $P_1 = 0.3$, $P_2 = 0.1$, $P_3 = 0.2$, $P_4 = 0.2$, and P_5 is unknown.

9. What is the probability that the you spin a 5?
- a) 0.4
 - b) 0.1
 - c) 0.3
 - d) X 0.2
10. What is the probability that the spinner lands on an even number?
- a) X 0.3
 - b) 0.6
 - c) 0.1
 - d) 0.7

11. What is the expected value of a spin (μ)?

- a) X 2.9
- b) 1
- c) 3
- d) 2.5

The next 3 questions refer to the following situation. Steve has an addiction to gambling but his wife won't allow him to go to a casino. So, he comes up with the following game to bet his friend, Drew. He puts the numbers 1-10 in a hat and asks Drew to draw 3 numbers out of the hat one at a time without replacement. Drew wins if the first number drawn is smaller than the second number drawn and the second number drawn is smaller than the third number drawn. Use the following output to answer the questions below. The number on the left is the first draw and the number on the right is the last draw.

```
Trial 1: 6 4 1
Trial 2: 2 3 6
Trial 3: 1 5 9
Trial 4: 6 10 3
Trial 5: 7 5 9
Trial 6: 1 8 4
Trial 7: 10 2 9
Trial 8: 7 4 6
Trial 9: 1 3 8
Trial 10: 9 5 4
```

12. What is the estimated probability that Drew wins the game?

- a) 0.6
- b) 0.7
- c) X 0.3
- d) 0.5

13. What is the error associated with this estimate?

- a) X 0.2898
- b) 0.7102
- c) 0.0458
- d) 0.0917

14. If this were to be done with the resampling class code, what are the minimum value, the maximum value, the number drawn, and the resampling type, respectively?

- a) 1,10,3,With Replacement
- b) 1,3,10,With Replacement
- c) X 1,10,3,Without Replacement
- d) 0,10,3,Without Replacement

The next 4 questions refer to the following situation: The Coopertucky High School golf team consists of 4 players: Byde, Don, Bernie, and Terry. Assume that the score for a Coopertucky golfer for 18 holes is normally distributed with a mean of 77 strokes and standard deviation of 6 strokes. Assume that the players' scores are independent of each other. Use the following output to answer the questions.

CUMULATIVE NORMAL DISTRIBUTION: $\text{pnorm}(75, 77, 36) = 0.4778$
CUMULATIVE NORMAL DISTRIBUTION: $\text{pnorm}(79, 77, 36) = 0.5221$
CUMULATIVE NORMAL DISTRIBUTION: $\text{pnorm}(79, 77, 18) = 0.5442$
CUMULATIVE NORMAL DISTRIBUTION: $\text{pnorm}(79, 77, 6) = 0.6306$
CUMULATIVE NORMAL DISTRIBUTION: $\text{pnorm}(75, 77, 6) = 0.3694$
CUMULATIVE NORMAL DISTRIBUTION: $\text{pnorm}(79, 77, 3) = 0.7475$

15. What is the probability that Byte's score is 79 or less?

- a) 0.5222
- b) X 0.6306
- c) 0.3694
- d) 0.4778

16. What is the probability that Bernie's score is between 75 and 79?

- a) X 0.2612
- b) 0.0443
- c) 0.7389
- d) 0.9557

17. What is the probability that Don's score is between 71 and 83? (Hint: You don't need any computer output to answer this question)

- a) X 0.68
- b) 1.0
- c) 0.95
- d) 0.5

18. The team must shoot a total of 316 or less to qualify for the state tournament. What is the probability that the team qualifies for the state tournament?

- a) 0.1581
- b) X 0.7475
- c) 0.5442
- d) 0.5879

The next 3 questions refer to the following situation. Jill has 9 country and 6 classic rock songs on her iPod. She shuffles the songs so that they only appear once in a random order. She goes for a quick run around the block and listens to the first 3 songs on her play list. Let A_1 be the event that the first song played is a country song and let A_2 be the event that the second song played is a country song.

19. What is the probability that A_1 occurs?

- a) X 0.6
- b) 0.3429
- c) 0.5
- d) 0.4

20. What is the probability that A_2 occurs given that A_1 has already occurred?
- a) 0.3429
 - b) 0.5
 - c) 0.6
 - d) X 0.5714
21. What is the probability that Jill listens to at least 1 classic rock song during her run?
- a) X 0.8154
 - b) 0.1846
 - c) 0.4
 - d) 0.5

The next 4 questions refer to the following situation. The sale price(Y) in dollars of a used car is linearly related to the mileage(X) of the car. The least squares fit is given by $\hat{Y} = 15000 - .17X$

22. What is the correct interpretation of the slope?
- a) X For every 1 additional mile driven, the sale price decreases by .17 dollars.
 - b) The predicted price of a new car is 15000 dollars.
 - c) For every 1 additional mile driven, the sale price increases by .17 dollars.
 - d) The slope has no practical meaning.
23. How much should Jim expect to pay for a car with 50000 miles?
- a) X 6500
 - b) 14150
 - c) 8500
 - d) It depends if he can get insurance.
24. Tami bought a used car with 25000 miles for 12000 dollars. According to the prediction equation, did she get a good deal?
- a) X No, because the residual is 1250.
 - b) It depends on the interest rate.
 - c) Yes, because the residual is -1250.
 - d) Yes, because the residual is 1250.
25. Which of the following are possible values for the sample correlation coefficient (r)?
- 1. 0.65
 - 2. -1.21
 - 3. -0.35
 - 4. -0.84
- a) None of the above
 - b) 1 and 2
 - c) X 3 and 4
 - d) 1