Dr. sc. Jilla Siassi
July 2019
HTW Berlin

Problem 1 **25 Points**

The following table gives the frequency distribution of the spot prices (in dollars) per barrel of crude oil for 15 business days from October 20 to November 9, 2004:

Prices from…to less than…		Number of Days
47	49	3
49	51	5
51	53	2
53	55	2
55	57	3

1. Find and *interpre*t the mean, variance, and standard deviation.
2. Using Chebyshev's theorem, find at least what percentage of the values of the data set lie within two standard deviation of the mean.

Problem 2 **25 Points**

The following data were collected on the height (inches) and weight (pounds) of women swimmers:

Height	68	64	62	65	66
Weight	132	108	102	115	128

1. Develop a scatter diagram for these data with height as the independent variable.
2. What does the scatter diagram indicate about the relationship between the two variables?
3. Try to approximate the relationship between height and weight by drawing a straight line through the data.
4. Develop the estimated regression equation.
5. Calculate and interpret the coefficient of determination.
6. If a swimmer's height is 63 inches, what would you estimate her weight to be?

Problem 3	**25 points**

The machines $M_i, i = 1, 2, 3,$ produce 20%, 45% and 35% respectively of the total production of a certain article in a firm. Experience shows that 2%, 5% and 3% of the articles produced on these machines are defective.
Find the probability that

1. a defective article has <u>not</u> been produced on the second machine .
2. a non-defective article has been produced either on the second or on the third machine.

Problem 4	**25 points**

The average stock price for companies making up the S&P500 is $30, and the standard deviation is $8.2 (*Business Week,* Special Annual Issue. Spring 2003). Assume the stock prices are normally distributed.

1. What is the probability a company will have a stock price of at least $40?
2. What is the probability the company will have a stock price no higher than $20?
3. How high does a stock price have to be to put a company in the top 10%?