MAT 1372 Statistics with Probability classwk 3 Spring 2012

# Measures of Central Location

## 3.2 The mean (aka average in Excel) is the sum of all the data points divided by their number:



For example, given the following data table

|  |  |
| --- | --- |
| val | freq |
| -1 | 3 |
| 0 | 2 |
| 1 | 5 |

Deviation: difference of a data value from the mean. For our example, we get

|  |  |  |  |
| --- | --- | --- | --- |
| val | dev | freq | prod of dev & freq |
| -1 | -1.2 | 3 | -3.6 |
| 0 | -.2 | 2 | -.4 |
| 1 | .8 | 5 | 4 |
|  |  | sum | 0 |

In symbols:



p.81

11. number of fires in Ontario (Canada):

The following data give the total number of fires in Ontario, Canada,

in the months of 2002:

6, 13, 5, 7, 7, 3, 7, 2, 5, 6, 9, 8

Find the sample mean of this data set.

14. The following is a frequency table of the ages of a sample of members

of a symphony for young adults.

Age Frequency

16 9

17 12

18 15

19 10

20 8

Find the sample mean of the given ages.

## 3.3 The median is the data point right in the middle for a sorted, odd sized data set and the average of the 2 data points which straddle the middle for a sorted, odd sized data set

p.87

4. The following are the speeds of 40 cars as measured by a radar device

on a city street:

22, 26, 31, 38, 27, 29, 33, 40, 36, 27, 25, 42, 28, 19, 28, 26, 33, 26, 37, 22,

31, 30, 44, 29, 25, 17, 46, 28, 31, 29, 40, 38, 26, 43, 45, 21, 29, 36, 33, 30

Make a frequency diagram and find the sample median.

15. Women make up the following percentages of the workforce in the 14 occupations listed.



For these percentages find

(a) The sample mean

(b) The sample median

It turns out that women make up 44.4 percent of the total workforce for these occupations. Is this consistent with your answers in (a) and (b)? Explain!

## 3.4 The mode is the value with the highest frequency

4. Suppose you want to guess the salary of a bank vice president whom you have just met. If you want to have the greatest chance of being correct to the nearest $1000, would you rather know the sample mean, the sample median, or the sample mode of the salaries of bank vice presidents?

7. Joggers use a quarter-mile track around an athletic field. In a sample of

17 joggers, 1 did 2 loops, 4 did 4 loops, 5 did 6 loops, 6 did 8 loops, and

1 did 12 loops.

**(a)** What is the sample mode of the number of loops run by these joggers?

**(b)** What is the sample mode of the distances run by these joggers?

**8.** The sample mean, sample median, and sample mode of the first 99 values of a data set of 198 values are all equal to 120. If the sample mean, median, and mode of the final 99 values are all equal to 100, what can you say about the sample mean of the entire data set? What can you say about the sample median? What about the sample mode?