

# UNIT 6: BUSINESS DECISION MAKING

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WEEK FIVE  
LECTURER: N. QUARRIE

# Learning Outcome Two (2)

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- LO2 Understand a range of techniques to analyse data effectively for business purposes

# Objective

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- By the end of this lesson you should be able to:
- 2.2 analyse the results to draw valid conclusions in a business context



# Overview

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- Last week's session focused on how to summarize data using representative values. We looked at representative values: mean, median, mode; calculation from raw data and frequency distributions using appropriate software.
- Now, its good to be able to calculate the above mentioned values but what's even more important is being able to interpret what they mean or are implying. This week we will focus on how to analyze the data to draw some conclusions.

# Mean

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- Using the sample example from last week:
- Ungrouped data: the age of the students in Unit Six class- 16, 18, 30, 20, 27, 24, 23. The mean age= $[(16+18+30+20+27+24+23)/7]=22.5$
- What is the above information implying? What conclusion could we draw?
- We could say that on average the age of the students is about 23/22. This is not to say that all students are 22/23. So we have to use the key phrase “on average.”

# Mean: Re drawing conclusion

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- Advantage: (Bbc.co.uk, 2016) -“All the data is used to find the answer.” So notice that we used the age for all students in the class to calculate the mean.
- Disadvantage: (Bbc.co.uk, 2016)-“Very large or very small numbers can distort the answer” we didn’t have any outliers in the example that we used. What are outliers? It is simply what (Bbc.co.uk, 2016) said-“Very large or very small numbers can distort the answer”

# Median

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- Advantage of the median:  
(Abs.gov.au, 2016) “The median is less affected by outliers and skewed data than the mean, and is usually the preferred measure of central tendency when the distribution is not symmetrical.”
- (Bbc.co.uk, 2016) “Very big and very small values don't affect it.”
- Limitation of the median:  
(Abs.gov.au, 2016) “The median cannot be identified for categorical nominal data, as it cannot be logically ordered.”
- (Bbc.co.uk, 2016) “Takes a long time to calculate for a very large set of data.”



# Median: drawing conclusions

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- Lets use the following data that represents the age of four friends in a basic school: 3, 4, 5, 6, 7
- The mean age = 5. Give that the number of values is 5. It means that there are two students who are older than five and two students that are younger than 5.
- See second example on the following page

# Median: drawing conclusions

Source: (Mathgoodies.com, 2016)

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The Jameson family drove through 7 states on their summer vacation. Gasoline prices varied from state to state. What is the median gasoline price?

\$1.79, \$1.61, \$1.96, \$2.09, \$1.84, \$1.75, \$2.11

Solution:

Ordering the data from least to greatest, we get:

\$1.61, \$1.75, \$1.79, **\$1.84**, \$1.96, \$2.09, \$2.11

Answer:

The median gasoline price is \$1.84. (There were 3 states with higher gasoline prices and 3 with lower prices.)

# Mode: Drawing conclusions/interpreting

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- Using the same data from the previous lesson:
- Ungrouped:
- Data set 1: 9, 9, 2, 3, 6. What is the mode in this case?
- Ans=9. What is this answer implying? Lets say that the data was about the price of the same sweets being sold at different shops in a community. A mode of 9 would be saying the most of the shops captured in the data set are selling the sweet for \$9.
- Data set 2: 20, 20, 18, 20, 22, 1, 20. What is the mode in this case?
- Ans=20. So a data set can have more than one mode. Assuming that the data represents the number of customers that comes to a grocery store on given days. What would your interpretation/conclusion be?
- Monday: 20
- Tuesday: 20
- Wednesday: 18
- Thursday: 20
- Friday: 22
- Saturday : 1
- Sunday: 20

# Mode: Drawbacks

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- Advantages:
- (Bbc.co.uk, 2016): “The only average we can use when the data is not numerical”
- Disadvantages: (Bbc.co.uk, 2016):
- “There may be more than one mode
- There may be no mode at all if none of the data is the same
- It may not accurately represent the data”

# NB!/Discussion

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- Please note that the results that you get when you use excel or any other software to calculate the representative values are can be interpreted as well. Conclusions can also be drawn from those results.
- Review the videos I included in the previous lesson and try to interpret those values.

# Videos

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Interpreting mean:

[https://www.youtube.com/watch?v=\\_kYU1yapT8g](https://www.youtube.com/watch?v=_kYU1yapT8g)

Interpreting Mean and Standard Deviation;  
Computation and Interpretation:

[https://www.youtube.com/watch?v=-\\_JI4\\_6LErI](https://www.youtube.com/watch?v=-_JI4_6LErI)

# Review Questions

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1. Click on the following link:

<http://www.mathgoodies.com/lessons/vol8/median.html>

Calculate the mean, mode and median highlighted and the interpret each value that you calculate.

2. Assume that you are collecting data for a business about a new product to be introduced to the market and that the data retrieved for a particular question is as follows:

Which flavor drink would you buy?

Grape

Passion fruit

Guava

Pineapple

**Results:** Grape (20%), Passion fruit (10%), Guava (30%), Pineapple (40%).

Using your knowledge of mode, interpret the above results and draw a conclusion

# References/Additional Reading List

- Abs.gov.au, (2016). *Statistical Language - Measures of Central Tendency*. [online] Available at: <http://www.abs.gov.au/websitedbs/a3121120.nsf/home/statistical+language+-+measures+of+central+tendency> [Accessed 26 Jan. 2016].
- Anon, (2016). [online] Available at: [https://www.uvm.edu/~streams/PDFFiles/tutorials/Data\\_Analyses\\_Tutorial\\_Module6.pdf](https://www.uvm.edu/~streams/PDFFiles/tutorials/Data_Analyses_Tutorial_Module6.pdf) [Accessed 26 Jan. 2016].
- Bbc.co.uk, (2016). *BBC - GCSE Bitesize: Advantages and disadvantages of mean, median and mode*. [online] Available at: <http://www.bbc.co.uk/schools/gcsebitesize/maths/statistics/measuresofaveragerev6.shtml> [Accessed 26 Jan. 2016].
- Mathgoodies.com, (2016). *The Median of a Set of Data*. [online] Available at: <http://www.mathgoodies.com/lessons/vol8/median.html> [Accessed 26 Jan. 2016].