

Computational Analysis Task – Casio ClassPad

The organisers of a surf contest examine two Victorian beaches as proposed venues for the contest. Each day, for two weeks, the organisers record the height of the surf (in metres). Their measurements are shown below:

Bells Beach:

1.2	1.5	1.6	1.3	1.8	1.4	1.6
1.3	1.4	1.8	1.5	1.4	1.1	1.0

Cape Woolamai:

0.9	1.8	0.7	1.8	1.9	0.4	0.6
1.6	1.9	2.2	2.4	1.8	1.5	1.9

The Statistical Analysis Task:

Your task is to complete a computational statistical analysis of the above data and compare this analysis to one done manually. You will then analyse the data and make conclusions regarding its significance.

The standard approach of analysing data sets such as these is to complete a number of different techniques, including the *five number summary*.

Each technique calculates an average using different types of computer algorithms. The algorithms themselves will look at:

The Mean

The Median

The Mode

The five number summary itself looks at:

The Minimum Value

The 3rd Quartile

The Median

The 1st Quartile and

The Maximum Value

Aim:

- (a) To analyse meteorological data to determine which beach has optimum surf conditions for a surf carnival.
- (b) To demonstrate how advances in computational power has enabled us to analyse data more quickly and efficiently.

Analysis of Surf Data:

Part A: You are required to time yourself as you analyse the following data using a scientific calculator. Use the Statistical Analysis Reference sheet if required.

1. Order the Bells Beach data from smallest to largest:

2. Calculate the Bells Beach Mean wave height:

3. Determine the Bells Beach Median wave height:

4. Calculate the Range of the Bells Beach surf data:

5. Calculate the Interquartile Range (IQR) of the Bells Beach surf data:

6. Order the Cape Woolamai data from smallest to largest:

7. Calculate the Cape Woolamai Mean wave height:

8. Determine the Cape Woolamai Median wave height:

9. Calculate the Range of the Cape Woolamai surf data:

10. Calculate the Interquartile Range (IQR) of the Cape Woolamai surf data:

Part B: Now time yourself as you analyse the following data using CAS technology. Use the CAS Technology for Statistical Analysis reference sheet if required.

1. On the **Statistics** page, label **list1** as 'Bells ' and **list2** as 'Woolamai '. Enter the corresponding values for each beach as shown in the table. Press **Enter** after entering each data value into the CAS calculator.
2. To find the mean and five number summary of each data set, tap:

Calc

Two-Variable.

Set values as:

XList: main\Bells

YList: main\Woolamai

Freq: 1

Tap OK

The x -values relate to Bells Beach and the y -values to Cape Woolamai. Scroll down to see all the statistics.

3. Use the summary statistical results from columns E and F to answer the questions outlined below. Column E represents “Bells Beach” and Column F represents “Cape Woolamai”.

Questions

1. What is the mean Bells Beach wave height?

2. What is the median Bells Beach wave height?

3. Calculate the Range of the Bells Beach surf data:

4. Calculate the Interquartile Range (IQR) of the Bells Beach surf data:

5. What is the mean Cape Woolamai wave height?

6. What is the median Cape Woolamai wave height?

7. Calculate the Range of the Cape Woolamai surf data:

8. Calculate the Interquartile Range (IQR) of the Cape Woolamai surf data:

9. The surf contest organisers would like the greatest height possible. However, a minimum height of 1.2 metres is required for the surf contest to run. Which beach would you recommend?

Reflection of Data Analysis Activity:

In the final part of this task, you need to reflect on how advances in computational processing has allowed for two significant ramifications: a) the increase in the amount of data being able to be processed as well as b) the decrease in time taken to actually analyse the data.

To assist in planning your reflection, complete the advanced organiser below to compare/contrast the two methods used to analyse the data.

Topic: _____

Concept 1:		Concept 2:
	How are they alike?	
	How are they different?	

