Junior Cert Maths

Free Notes

Stem and Leaf Plot

Stem and Leaf Plot

A Stem and Leaf plot displays values horizontally. The Stems represent the first part of each number and the leaves represent the remaining part of each number

For example the numbers 50, 52, 57, 61, 65, 68, 69, 73, 77 are expressed as

Stem	Leaf
5	0 2 7
6	1 5 8 9
7	3 7

It helps to put the values in order for your Stem and Leaf plot as this makes it easier to calculate the median and the mode of your sequence.

A Back to back Stem and leaf diagram just means that you represent two sets of data on the same graph, One set on the left-hand side of the graph and the other set on the right-hand side of the

Questions

1. The ages of the 30 people who took part in an aerobics class are as follows:

18 24 32 37 9 13 22 41 51 49 15 42 37 58 48 53 27 54 42 24 33 48 56 17 61 37 63 45 20 39

The ages of the 30 people who took part in a swimming class are as follows:

16 22 29 7 36 45 12 38 52 13 33 41 24 35 51 8 47 22 14 24 42 62 15 24 23 31 53 36 48 18(i)

(i) Represent this data on a back-to-back stem-and-leaf diagram.

Aerobics Class		Swimming Class
9	0	7 8
3 5 7 8	1	2 3 4 5 6 8
0 2 4 4 7	2	2 2 3 4 4 4 9
2 3 7 7 7 9	3	1 3 5 6 6 8
1 2 2 5 8 8 9	4	1 2 5 7 8
1 3 4 6 8	5	1 2 3
1 3	6	2

(ii) Use your diagram to identify the median in each case.

30 values so we add our middle two values which are our 15th and 16th values and divide by 2

Aerobics Class Median = $\dfrac{37+39}{2}$ = 38

Swimming Class Median = $\dfrac{29+31}{2}$ = 30

(iii) What other measure of central tendancy could have been used when examining this data?

Central tendancy means Mean, Mode, Median so Mean and mode could also be used

(iv) Based on the data make one observation about the ages of the two groups.

Older people tend to be in the Aerobics class and young people tend to do the Swimming class

2. The ages of the Academy Award winners for best male actor and best female actor (at the time they won the award) from 1992 to 2011 are as follows:

Male actor   54 52 37 38 32 45 60 46 40 36 47 29 43 37 38 45 50 48 60 50

Female actor 42 29 33 36 45 49 39 26 25 33 35 35 28 30 29 61 32 33 45 29

Represent the data on a back-to-back stem-and-leaf diagram.

Male Actors		Female Actors
9	2	5 6 8 9 9 9
2 6 7 7 8 8	3	0 2 3 3 3 5 5 6 9
0 3 5 5 6 7 8	4	2 5 5 9
0 0 2 4	5	
0 0	6	1

(ii) State one similarity and one difference that can be observed between the ages of the male and female winners.

Similarity: There are very few winners over the age of 60

Difference: The females tend to be younger than the males

(iii) Mary says "The female winners were younger than the male winners."Investigate this statement in relation to the mean age of the male winners and mean age of the female winners.

Mean age of the male actors is

$$\frac{29 + 32 + 36 + 37 + 37 + 38 + 38 + 40 + 43 + 45 + 45 + 46 + 47 + 48 + 50 + 50 + 52 + 54 + 60 + 60}{20}$$

Mean age of Male actors = 44.35

Mean age of the female actors is

$$\frac{25 + 26 + 28 + 29 + 29 + 29 + 30 + 32 + 33 + 33 + 33 + 35 + 35 + 36 + 39 + 42 + 45 + 45 + 49 + 61}{20}$$

Mean age of the female actors = 35.7

Statement is true as mean age of the female actors is less than that of the male actors

(iii) The median age of the male winners and the median age of the female winners

20 values so we add our 10th and 11th values and divide by 2

Median Age of Male Actors $\dfrac{45+45}{2} = 45$

Median Age of Female Actors $\dfrac{33+33}{2} = 33$

(iv) Find the interquartile ranges of the ages of the male winners and of the female winners

We want to split our data into two and find the median of the lower half of our data to get our lower quartile and find the median of the upper half of our data to get our upper quartile

Male Winners

Get the median of our first ten figures to get our lower quartile

Add our 5th and 6th value and divide by 2

Lower Quartile = $\dfrac{37+38}{2} = 37.5$

Get the median of our second ten figures to get our upper quartile

Add our 15th and 16th value and divide by 2 $\dfrac{50+50}{2} = 50$

Inter - Quartile Range = 50 -37.5 = 12.5

Female Winners

Lower Quartile $\dfrac{29+29}{2} = 29$ Upper Quartile $\dfrac{39+42}{2} = 40.5$

Inter - Quartile Range = 40.5 – 29 = 11.

3. John's third-year Physical Education class did a fitness test. The number of sit-ups that each student did in one minute is recorded below:

59 48 27 53 36 29 52 46 45 37 49 51 33 45 38 52 40 51 37 44 47 45 60 41

The students practiced this exercise for the next three weeks and then repeated the test in the same order. The data for the second test are as follows:

61 52 33 51 39 40 50 49 46 37 59 49 38 48 39 58 44 52 38 44 49 51 62 44

(i) Represent the data from the two tests on a back-to-back stem-and-leaf diagram.

Test 2		Test 1
	2	7 9
3 7 8 9 9	3	6 7 7 8
0 4 4 4 6 8 9 9 9	4	0 1 4 5 5 5 6 7 8 9
0 1 1 2 2 8 9	5	1 1 2 2 3 9
2 1	6	0

(ii) How many students are in the class?

24 Students

(iii) What is the range of sit-ups for the class?

Test 1 60 -27 = 33

Test 2 62 -33 = 29

(iv) Based on the data and the diagram, do you think that practice improves the ability to do situps? Give a reason for your answer.

Yes as it can be seen from our stem and leaf diagram there is a general shift of data upwards

(v) John did 41 sit-ups in Test 1 and 44 in Test 2. How did his performance compare with that of the rest of the class?

There were 8 people below him before the practice. There were only 7 people below him after the practice. Therefore he moved down relative to his classmates

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