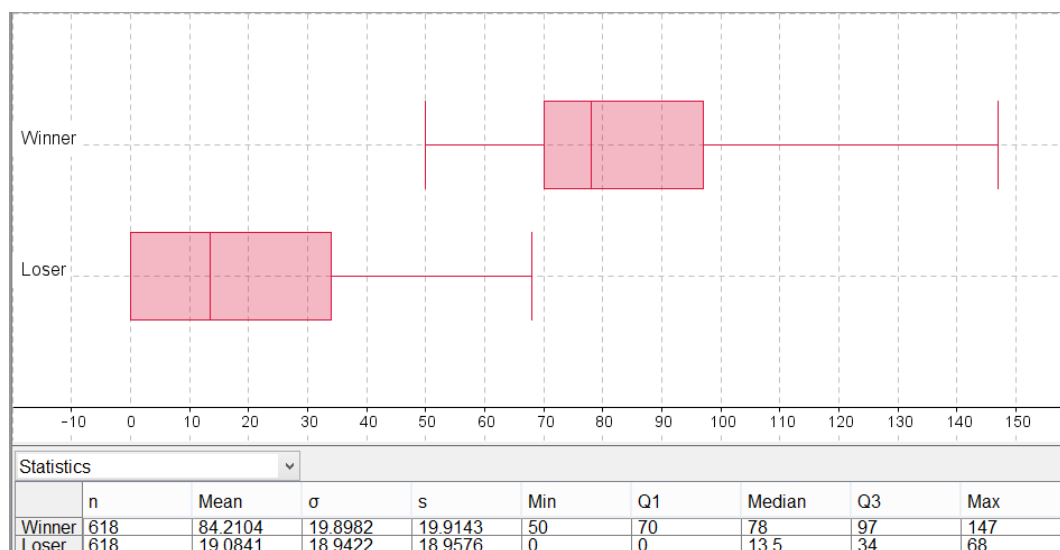


Section 2: Data presentation and interpretation

Exercise level 3 (Extension)

1. In the 2016 World Snooker Championships 618 frames of snooker were played. The full results are available through the following link <http://www.bbc.co.uk/sport/snooker/36043537>. In every frame there were two players, and the player with the higher score was the winner (a draw is impossible). The players pot balls and score points for the balls they pot. The score of the winner and loser in every frame was collected and the results are displayed in the diagram below:



- By referring to the range, interquartile range, and standard deviation, write three comments comparing the spread of these data sets.
- Which measure of centre, the mean, median or midrange would you suggest was the most representative of the winners' scores?
- What was the modal score of the loser? Of the winner? Or is it impossible to say exactly?
- An outlier is a value 1.5 IQRs above the UQ or below the LQ. Are there any outliers in either data set?
- The data is combined into a single data set of 1236 snooker scores. Can you work out, exactly or approximately, the lower quartile of the combined data set? What about the mean? The median?

Often in snooker a frame is conceded by the loser before all the balls are potted and all the possible points are scored.

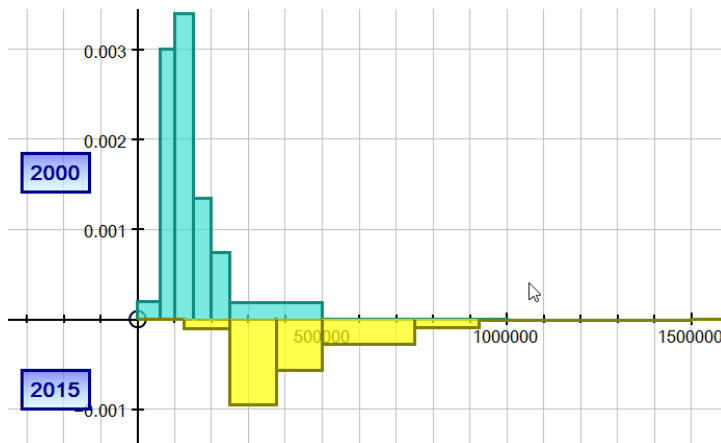
- If the rules were changed to stop players conceding, what effects might you expect on the winning and losing scores?

Edexcel AS Maths Data 2 Exercise

2. The sold price of houses sold in the UK is available through a government database called the Land Registry <http://landregistry.data.gov.uk/app/ppd>. Searching for the postcode CB4 for the calendar years 2000 and 2015 gives the sold house prices (detached, semi-detached and terraced) in those years, the results are summarised in the tables and back-to-back histogram below

House Prices in the year 2000, £ x	Freq.
$0 \leq x < 60000$	12
$60000 \leq x < 100000$	120
$100000 \leq x < 150000$	170
$150000 \leq x < 200000$	67
$200000 \leq x < 250000$	37
$250000 \leq x < 500000$	46
$500000 \leq x < 1000000$	1

House Prices in the year 2015, £ x.	Freq.
$125000 \leq x < 250000$	13
$250000 \leq x < 375000$	119
$375000 \leq x < 500000$	71
$500000 \leq x < 750000$	69
$750000 \leq x < 925000$	17
$925000 \leq x < 1500000$	6
$1500000 \leq x < 5000000$	1



- (i) Write 3 different comments comparing the housing market in the CB4 area in the years 2000 and 2015.

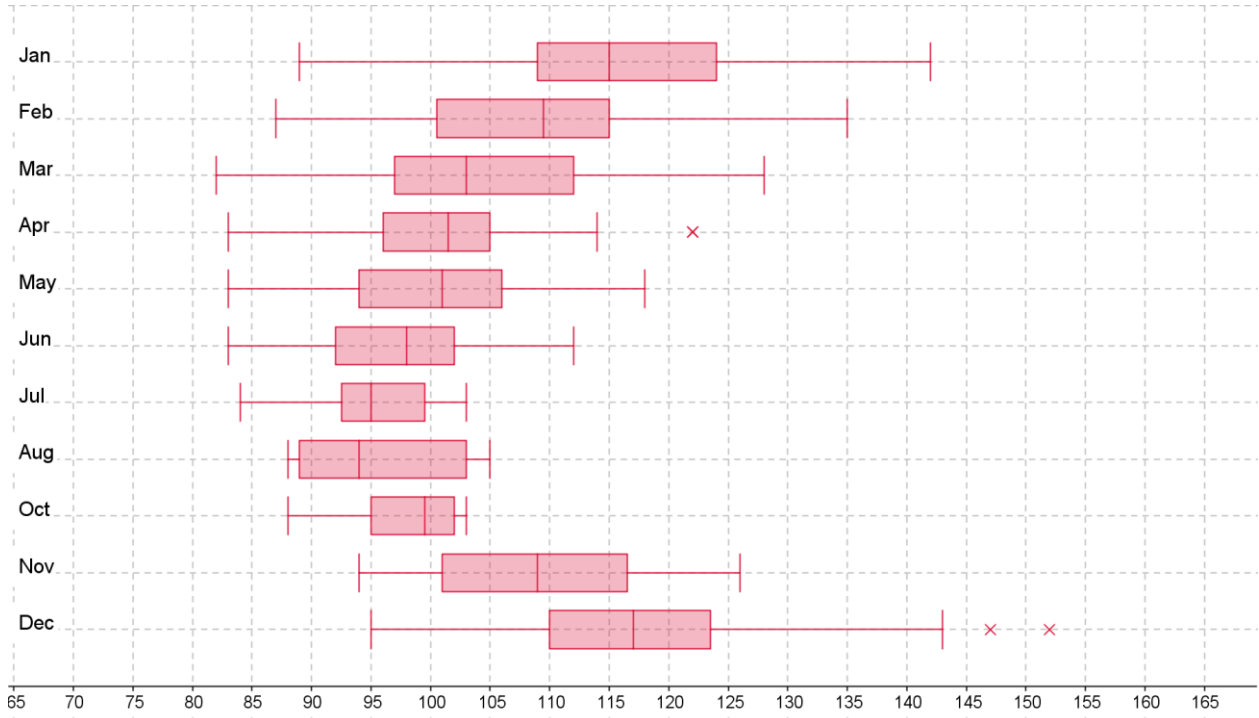
When a house is purchased a fee called stamp duty is payable to the government, which is dependent on the value of the property. The government sometimes changes the rates for political and economic reasons.

2000 Stamp Duty Rates (percentage payable on total value)	2015 Stamp Duty Rates (percentage paid only on the part of the value which falls into each band)
Up to £60,000 - 0%	Up to £125,000 - 0%.
Over £60,000 and under £250,000 - 1%	Over £125,000 to £250,000 - 2%.
Over £250,000 and under £500,000 - 3%	Over £250,000 to £925,000 - 5%.
Over £500,000 - 4%	Over £925,000 to £1,500,000 - 10%.
	Over £1,500,000 - 12%

- (ii) A house selling for £200,000 would pay £2,000 stamp duty in 2000 (1% of £200,000) and £1,500 (2% of £75,000) stamp duty in 2015. Estimate the stamp duty revenue earned by the government on the property sales in the CB4 postcode area in 2000 and 2015. State any assumptions you make. Are these assumptions reasonable? Has the revenue earned increased in line with the increase in house prices?

Edexcel AS Maths Data 2 Exercise

3. From 1988 until 2015, blackbirds entering a garden in the East Midlands are captured and data about the bird is recorded before it is released. This data is available on <http://www.mei.org.uk/data-sets>. The diagram below shows the data (when available) for the weights of the birds captured in different months of the year (no blackbirds were ever captured in September). Any weight more than 1.5xIQR above the UQ or below the LQ is shown as a cross.



	n	Mean	σ	s	Min	Q1	Median	Q3	Max
Jan	178	115.5393	10.0572	10.0856	89	109	115	124	142
Feb	136	108.875	9.6835	9.7193	87	100.5	109.5	115	135
Mar	72	103.6389	9.7572	9.8257	82	97	103	112	128
Apr	50	101.56	7.8311	7.9106	83	96	101.5	105	122
May	65	100.0462	7.8278	7.8887	83	94	101	106	118
Jun	46	97.1087	7.2748	7.3552	83	92	98	102	112
Jul	24	95.2083	5.1638	5.2749	84	92.5	95	99.5	103
Aug	6	95.5	6.4485	7.064	88	89	94	103	105
Oct	10	98.2	4.49	4.7329	88	95	99.5	102	103
Nov	8	109.125	10.0925	10.7894	94	101	109	116.5	126
Dec	105	116.7619	10.5772	10.6279	95	110	117	123.5	152

Does the evidence support any of the following claims?

- (i) There is a lot of variation in blackbird weights.
- (ii) Blackbirds put on weight to survive the winter.
- (iii) Blackbirds are usually born in spring.
- (iv) The weights of blackbirds tend to have a positive skew.
- (v) You could guess from the weight of a blackbird the time of year that it was caught.
- (vi) Blackbirds are harder to capture in spring.
- (vii) Blackbirds rarely weigh below 80 grams.
- (viii) Blackbirds are rarely found in the UK in August to November.
- (ix) Suitable food for blackbirds is harder to come by in the winter months.