Name: _____ Business Data Analysis
Date: 201-316-VA

Solutions to Class Exercise #1: Frequency Tables

1. **Possible Domestic Disturbance**

In May 2018, a concerned neighbour in Germany called the police to report a domestic dispute after hearing loud shouting coming from next door[1]. When the police arrived, it turned out to be a man arguing with his parrot. No word on who won the argument.

Amazon and African Grey parrots are known for their ability to learn new words and mimic human speech. For 75 randomly selected parrots from Germany, the number of words in their vocabulary are presented below:

802	804	806	810	810	812	822	825	826	835	841	848	850
851	859	865	873	875	877	892	895	898	898	908	912	912
913	914	914	916	917	921	928	936	941	942	945	950	953
978	993	994	1001	1002	1005	1023	1026	1031	1033	1034	1045	1066
1070	1080	1087	1088	1095	1096	1098	1100	1125	1132	1132	1142	1145
1156	1163	1165	1166	1173	1180	1180	1184	1185	1186			

(a) Using six classes, calculate the class width.

$$CW = \frac{\text{Highest Value} - \text{Lowest Value}}{6} = \frac{1186 - 802}{6} = 64 \quad \Rightarrow \quad CW = 65$$

(b) Complete the table below:

Number of Words	Number of Parrots
802 – 866	16
867 – 931	17
932 – 996	9
997 – 1061	9
1062 – 1126	10
1127 – 1191	14

(c) Fill in the blanks:

i. The last class contains **14** parrots and represents **18.67** % of the data in the sample.

ii. **17** parrots can be found in the most frequently occurring category.

This group of birds have between **867** and **931** words in their vocabulary.

[1] http://www.theguardian.pe.ca/news/domestic-dispute-in-germany-man-arguing-with-a-parrot-210278/

2. **Thrift Shop Find**

Two college students in Florida found several spacesuits at their local Salvation Army store and snapped them up for under two dollars[2]. The American Space Museum says they're authentic and worth thousands. NASA later confirmed that suits were indeed "the real McCoy" and that they were used in two space missions during the 1980's. The value of suits from the thrift store haul is estimated to be $\$\,20\,000$.

The price (rounded to the nearest dollar) for several suits found at a thrift store are presented below.

38	38	38	38	38	39	40	40	40	42	43	43	45	46
48	53	53	53	54	55	56	56	56	58	59	60	60	61
61	62	62	64	64	64	66	67	67	71	71	72	73	73
73	73	75	79	80	80	80	82	84	85	86	87	88	95
100	104	108	109										

(a) Using seven classes, calculate the class width.

$$CW = \frac{\text{Highest Value} - \text{Lowest Value}}{7} = \frac{109 - 38}{7} = 10.14 \quad \Rightarrow \quad CW = 11$$

(b) Complete the table below.

Price of Suit ($)	**Number of Suits**	**Rel. Freq.** (%)
$38 - 48$	15	25.00
$49 - 59$	10	16.67
$60 - 70$	12	20.00
$71 - 81$	12	20.00
$82 - 92$	6	10.00
$93 - 103$	2	3.33
$104 - 114$	3	5.00

(c) The first class contains **15** suits and represent **25.00** % of the sample.

(d) The middle three classes contain a total of **30** suits, and represent **50.00** % of the sample.

(e) The least frequently occurring class are suits priced between $**93** and $**103**.

They account for **3.33** % of the sample.

[2]https://www.cnet.com/news/nasa-flight-suits-thrift-store-florida-space-shuttle-american-museum/

3. **Handle With Care**

In the US, you can send live scorpions through the mail - provided that they are in a box labeled as "live scorpions" inside another box also labeled as "live scorpions"[3]. On their website, the US Postal system offers helpful guidelines on how to package the mailpiece so that none of its contents escape during normal Postal Service handling and transport.

The Arizona bark scorpion is the most common species of scorpion found in the US[4]. Below are the lengths (in millimetres) for several bark scorpions which were collected at a mail processing plant.

60	60	60	60	60	60	61	62	62	62	63	63	63	63	64	64	65	65	65	66
66	67	67	67	68	68	69	69	69	69	69	70	70	70	70	70	71	71	72	72
73	74	74	74	75	76	76	77	77	78	79	80	83	83	84	84	85	85	86	86
86	86	86	88	89	89	90	90	90	91	91	92	93	93	94	94	95	95	95	95

(a) Using six classes, calculate the class width.

$$CW = \frac{\text{Highest Value} - \text{Lowest Value}}{6} = \frac{95 - 60}{6} = 5.83 \quad \Rightarrow \quad CW = 6$$

(b) Complete the table below.

Length (in mm)	**Number of Scorpions**	**Rel. Freq.** (%)	**LTCF**	**LTCF** (%)
$60 - 65$	19	23.75	19	23.75
$66 - 71$	19	23.75	38	47.50
$72 - 77$	11	13.75	49	61.25
$78 - 83$	5	6.25	54	67.50
$84 - 89$	12	15.00	66	82.50
$90 - 95$	14	17.50	80	100.00

(c) The total number of scorpions which are classed into the first two categories is: **38**

(d) The number of scorpions in the sample which have a length of 77 mm or less is: **49**

(e) How many scorpions in the sample have a length of 83 mm or less? **54**

(f) What percentage of the scorpions have a length of 89 mm or less? **82.50%**

[3] https://pe.usps.com/text/pub52/pub52c5_008.htm
[4] https://en.wikipedia.org/wiki/Arizona_bark_scorpion