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CS 6850 Assignment 5+6

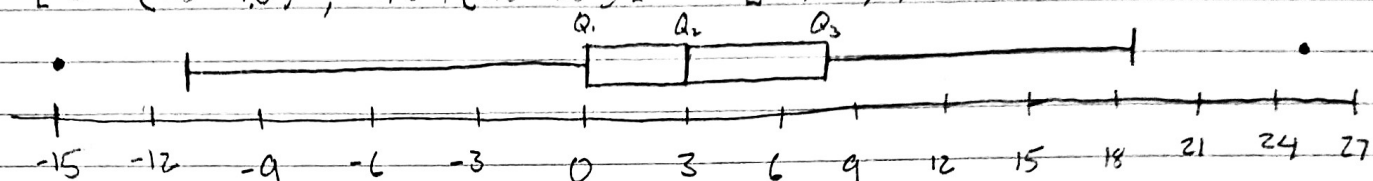
1 a)

$\{-15, -1, 1, 2, 3, 7, 7, 8, 25\}$

$$Q_1 = \frac{-1+1}{2} = 0 \quad Q_2 \quad Q_3 = \frac{7+8}{2} = 7.5$$

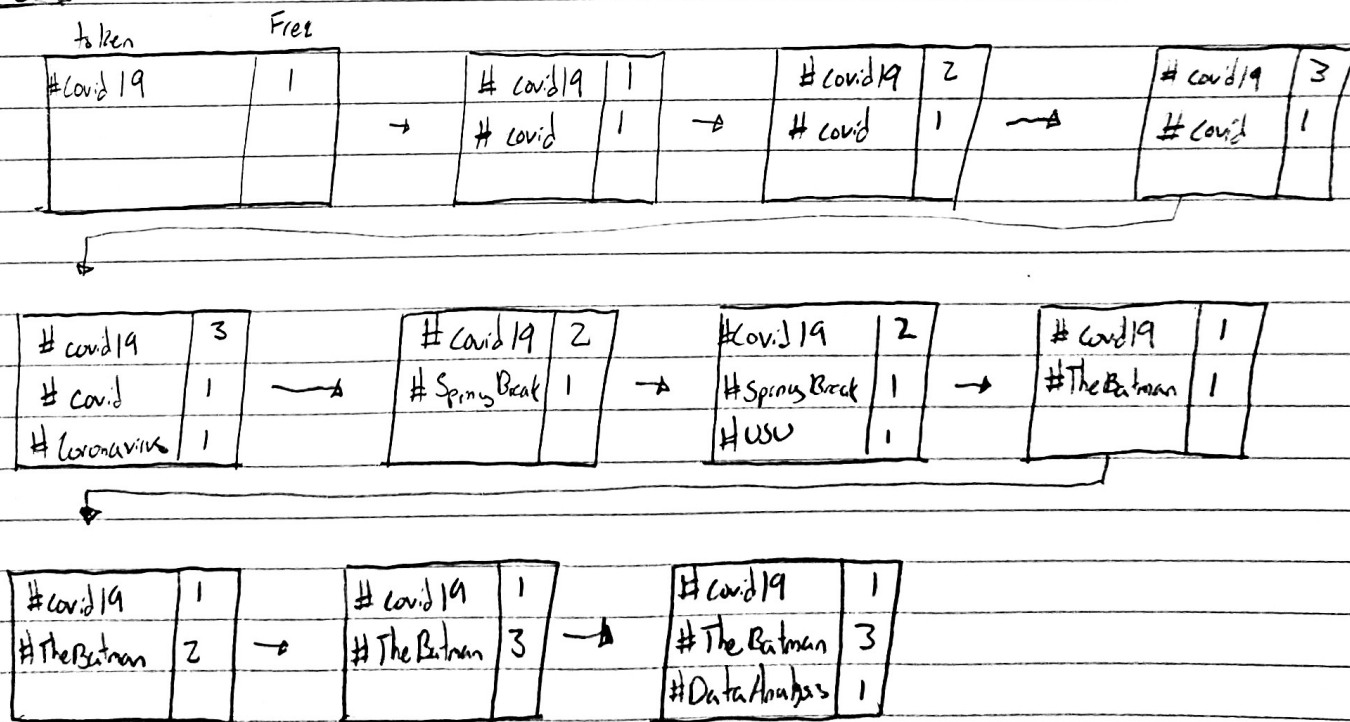
$$IQR = Q_3 - Q_1 = 7.5 - 0 = 7.5$$

$$[0 - (1.5 \cdot 7.5), 7.5 + (1.5 \cdot 7.5)] = [-11.25, 18.75]$$



b) the whiskers are much shorter when plotted with seaborn boxplot in python

3a) $K=4$ a)



in

4 a) $d = \text{number of items} = 7$

{ Bread, coffee, sugar, milk, Butter, cookies, eggs }

$$\text{rules} = 3^d - 2^{d+1} + 1 = 3^7 - 2^8 + 1 = 1,932 \text{ possible rules}$$

b)

itemset	Support	$\rightarrow A$	Freq itemset	support
Bread	7/10		Bread	0.7
coffee	4/10		coffee	0.4
sugar	3/10		milk	0.7
milk	7/10		butter	0.4
butter	4/10		Bread milk	0.4
cookies	2/10		Bread butter	0.4
eggs	3/10			
Bread coffee	1/10			
Bread milk	4/10			
bread butter	4/10			
milk coffee	3/10			
milk butter	2/10			
Bread milk butter	2/10			

c)	possible rule	supp	conf.	possible rule	supp	conf.
Bread	\rightarrow coffee	1/10		milk	\rightarrow bread butter	2/10
Bread	\rightarrow milk	4/10	4/7	butter	\rightarrow bread	4/10 4/4
bread	\rightarrow butter	4/10	4/7	butter	\rightarrow coffee	0/10
coffee	\rightarrow Bread	1/10		butter	\rightarrow milk	2/10
coffee	\rightarrow milk	3/10		butter	\rightarrow bread milk	2/10
coffee	\rightarrow butter	0/10		Bread milk	\rightarrow coffee	0/10
coffee	\rightarrow bread milk	0/10		Bread milk	\rightarrow butter	2/10
coffee	\rightarrow bread butter	0/10		Bread butter	\rightarrow coffee	0/10
milk	\rightarrow bread	4/10	4/7	Bread butter	\rightarrow milk	2/10
milk	\rightarrow coffee	3/10				
milk	\rightarrow butter	2/10				

c) Cont. on next page

for $\text{supp} \geq 40\%$ $\text{conf} \geq 50\%$

4 c)	Final rules	Support	Confidence
	Bread \rightarrow milk	40%	57.1%
	Bread \rightarrow butter	40%	57.1%
	milk \rightarrow bread	40%	57.1%
	butter \rightarrow bread	40%	100%