Psych 315, Winter 2021, Homework 1 Answer Key

Due Friday, January 8 in section by 5pm.

Name _____ ID _____

Problem 0) Fill out the Catalyst survey as accurately as possible. We'll be referring to this data throughout the quarter. Please note that I will be publishing a csv file contaning an anonymized set of this data for the class to use for examples throughout the quarter.

https://catalyst.uw.edu/webq/survey/gboynton/400655

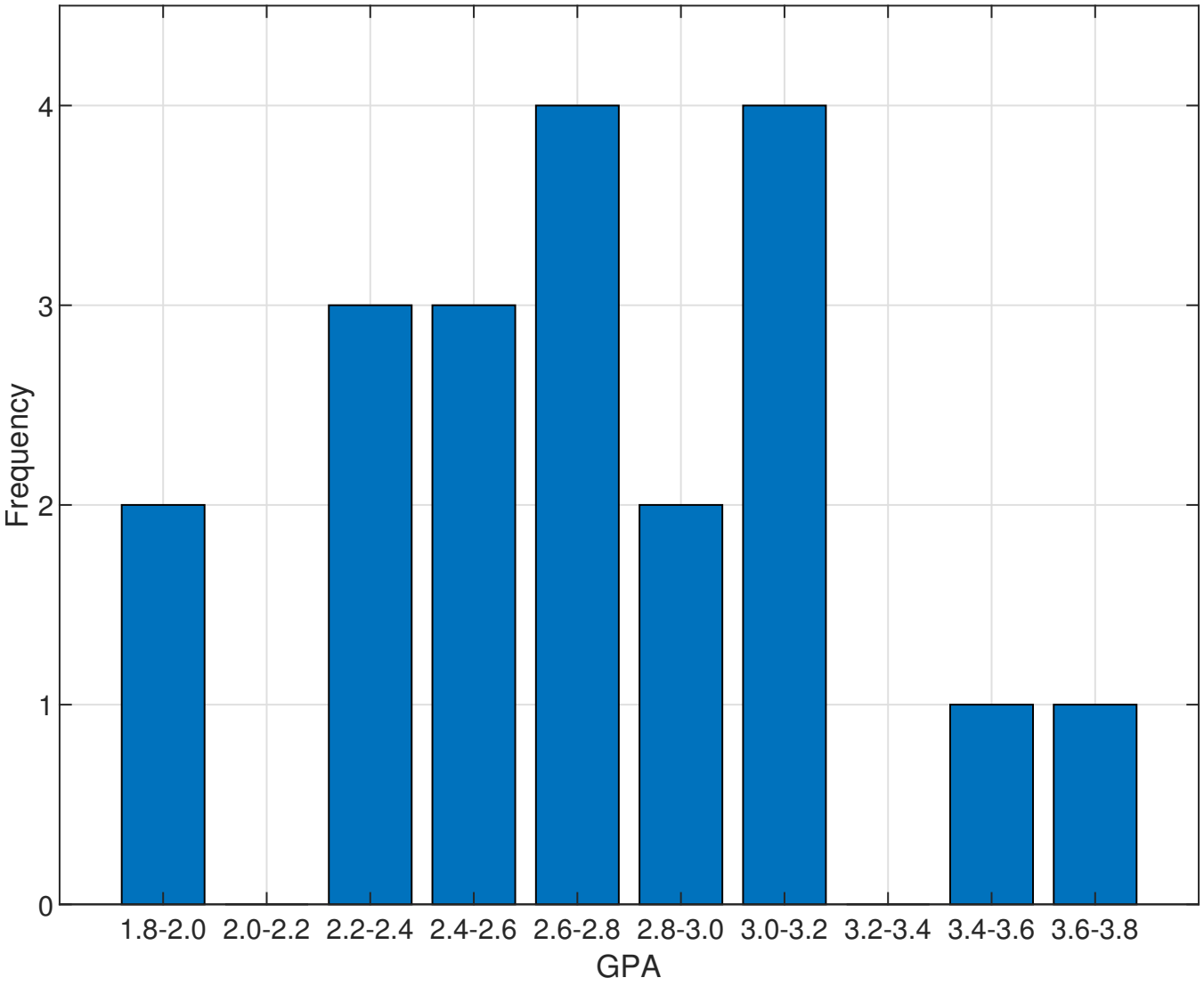
The rest of the problems in this homework set will be based on this table of 20 GPA's.

3.49	2.46	1.97	2.93
2.33	2.35	2.69	3.76
2.51	2.38	2.71	3.02
1.87	3.17	2.89	3.2
3.09	2.64	2.43	2.63

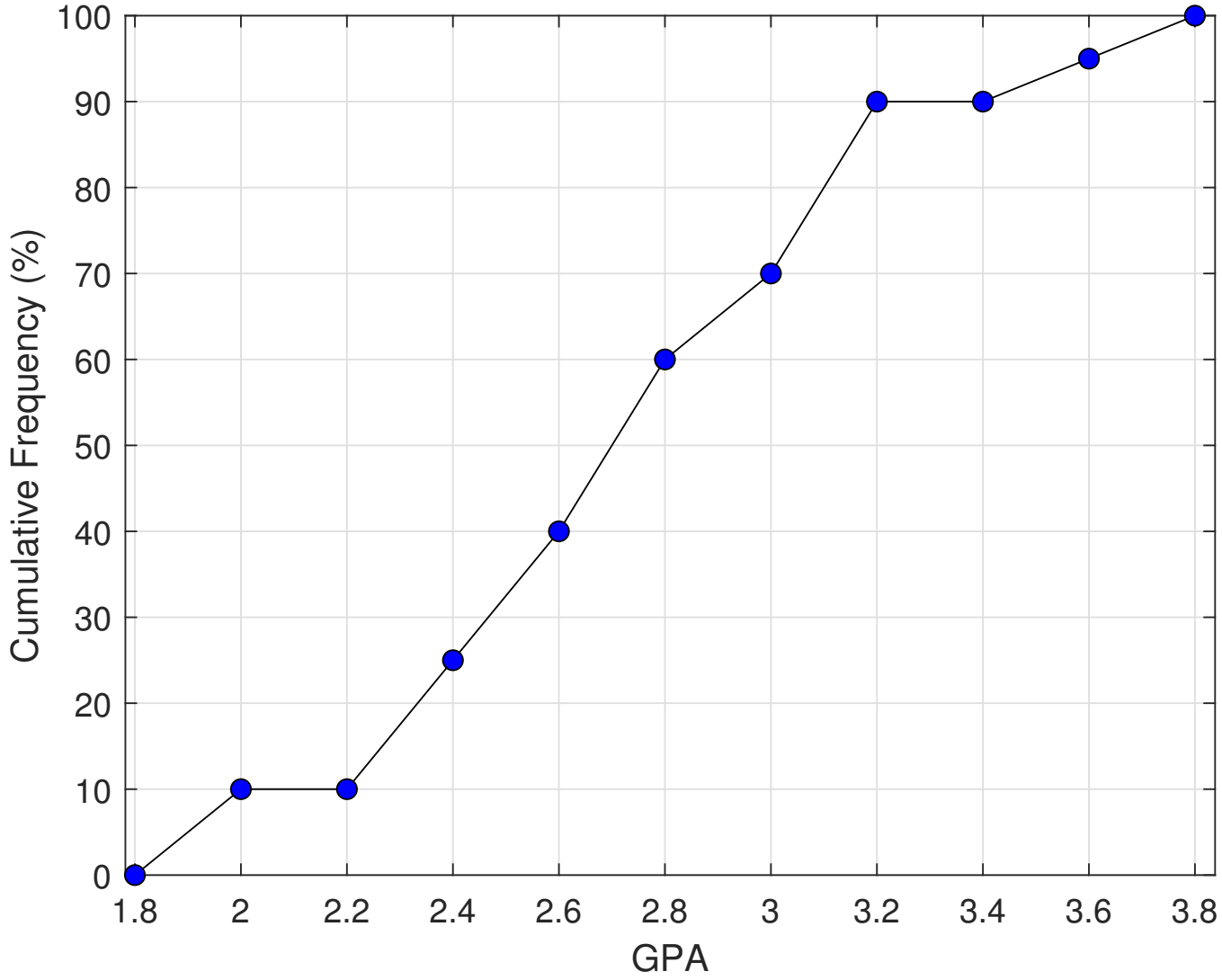
You can find the csv file containing these GPAs here: HW1GPAs.csv
Problem 1) Starting with the lowest class interval of 1.8 and a class interval width of 0.2, fill in the table below. Remember, for scores that fall on the border between two class intervals, put the score in the **lower** interval.

Class interval	Frequency	Relative frequency (%)	Cumulative frequency (%)
1.8-2.0	2	10	10
2.0-2.2	0	0	10
2.2-2.4	3	15	25
2.4-2.6	3	15	40
2.6-2.8	4	20	60
2.8-3.0	2	10	70
3.0-3.2	4	20	90
3.2-3.4	0	0	90
3.4-3.6	1	5	95
3.6-3.8	1	5	100

Problem 2) Make a histogram showing the frequency distribution of the GPAs based on these class intervals on the graph below. Be sure to label your axes.



Problem 3) Draw a cumulative percentage curve on the graph below based on the same class intervals. Be sure to label your axes.



Problem 4) Use this cumulative percentage curve to:

a) estimate the percentile rank for a score of 3.5

The percentile rank for a gpa of 3.50 is about 93

b) estimate the percentile point for a percentile rank of 50%

The percentile point for a percentile rank of 50 is about 2.7

c) estimate the percentage of students that like red that have a GPA below 2.5.

About 32

d) estimate the percentile points for ranks of 25% and 75%.

The percentile point for a percentile rank of 25 is about 2.40
The percentile point for a percentile rank of 75 is about 3.05

Problem 5) Fill in the table below for calculating percentile ranks from raw scores like we did in class. See slides 22-24 from:

`http://courses.washington.edu/psy315/lecture_notes_pptx/Ch2_3_frequency_distributions.ppt`
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Score (P)	Rank (C)	$C - .5$	$R = 100\frac{(C-.5)}{20}$
1.87	1	0.5	2.5
1.97	2	1.5	7.5
2.33	3	2.5	12.5
2.35	4	3.5	17.5
2.38	5	4.5	22.5
2.43	6	5.5	27.5
2.46	7	6.5	32.5
2.51	8	7.5	37.5
2.63	9	8.5	42.5
2.64	10	9.5	47.5
2.69	11	10.5	52.5
2.71	12	11.5	57.5
2.89	13	12.5	62.5
2.93	14	13.5	67.5
3.02	15	14.5	72.5
3.09	16	15.5	77.5
3.17	17	16.5	82.5
3.2	18	17.5	87.5
3.49	19	18.5	92.5
3.76	20	19.5	97.5

a) Use this table and the formula from the lecture notes to calculate the percentile rank for a GPA of 3.43

$R = 87.5 + (92.5 - 87.5)\frac{(3.43-3.2)}{(3.49-3.2)} = 91.4655$

b) Use the table and the formula from lecture to calculate the percentile point for percentile ranks of 25 and 75. Are they close to the estimates from problem 4d?

For a percentile rank of 25

$P_{25} = 2.38 + (2.43 - 2.38)\frac{(25-22.5)}{(27.5-22.5)} = 2.405$

For a percentile rank of 75

$P_{75} = 3.02 + (3.09 - 3.02)\frac{(75-72.5)}{(77.5-72.5)} = 3.055$

c) The 'Semi-Interquartile Range' (given the letter 'Q') is defined by half the difference between the 75th and the 25th percentile point. Calculate Q based on your answer from part **b**.

$Q = \frac{3.05-2.41}{2} = 0.32$