Analysis of the Survey Report

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Brief Overview:

The pre-survey includes 15 items, out of which 14 items were multiple-choice questions and one was an open-ended question. Participating in the survey study was voluntary.The invitation emails were sent to all three sections of MATH-150 courses (i.e.D100, D200, D300). The total number of participants was 94. The summary of the survey responses will be presented in the following section.

[I have a subset of the problem i.e 5 questions]

Q-1) Interaction with an instructor in whiteboard class helped me see him/her as approachable.

Q-2) Interaction with the instructor in the whiteboard class helped me understand the course material better.

Q-3) My communication with the instructor was encouraging to ask more questions and get help.

Q-4) Whiteboard class is a joyful experience.

Q-5) Whiteboard class is a stressful experience.

[Step-1] I read the report and converted those bar charts into numerical form and formed a dataset in CSV format so that I could do feature extraction and feature modification.

:

	Strongly Agree	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	Strongly Disagree
0	0.425	0.325	0.075	0.035	0.05	0.050	0.040
1	0.300	0.410	0.200	0.030	0.03	0.015	0.015
2	0.310	0.330	0.150	0.180	0.03	0.010	0.090
3	0.240	0.250	0.240	0.080	0.08	0.055	0.055
4	0.080	0.080	0.245	0.080	0.18	0.270	0.085

(These are percentages of 5 questions (Row-wise) and 7 features along columns. Each cell corresponds to the percentage in decimal format)

[Step-2] I multiplied the Dataframe with 94 (Size of the batch/ Number of students in the Survey)

	Strongly Agree	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	Strongly Disagree
0	39.95	30.55	7.05	3.29	4.70	4.70	3.76
1	28.20	38.54	18.80	2.82	2.82	1.41	1.41
2	29.14	31.02	14.10	16.92	2.82	0.94	8.46
3	22.56	23.50	22.56	7.52	7.52	5.17	5.17
4	7.52	7.52	23.03	7.52	16.92	25.38	7.99

[Step-3] Made new features Positive and Negative which are basically sum of columns as shown below:
Positive = Strongly Agree + Agree + Somewhat Agree
Negative= Strongly Disagree + Disagree + Somewhat Disagree
Neutral = Neither Agree nor Disagree

	Strongly Agree	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	Strongly Disagree	positive	negative
0	39.95	30.55	7.05	3.29	4.70	4.70	3.76	77.55	13.16
1	28.20	38.54	18.80	2.82	2.82	1.41	1.41	85.54	5.64
2	29.14	31.02	14.10	16.92	2.82	0.94	8.46	74.26	12.22
3	22.56	23.50	22.56	7.52	7.52	5.17	5.17	68.62	17.86
4	7.52	7.52	23.03	7.52	16.92	25.38	7.99	38.07	50.29

[Step-4] Formed New features like positive% , Negative% and Neutral%

	Strongly Agree	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	Strongly Disagree	positive	negative	positive%	negative%	Neutral%
0	39.95	30.55	7.05	3.29	4.70	4.70	3.76	77.55	13.16	82.500000	14.000000	3.500000
1	28.20	38.54	18.80	2.82	2.82	1.41	1.41	85.54	5.64	91.000000	6.000000	3.000000
2	29.14	31.02	14.10	16.92	2.82	0.94	8.46	74.26	12.22	71.818182	11.818182	16.363636
3	22.56	23.50	22.56	7.52	7.52	5.17	5.17	68.62	17.86	73.000000	19.000000	8.000000
4	7.52	7.52	23.03	7.52	16.92	25.38	7.99	38.07	50.29	39.705882	52.450980	7.843137

[Step-5] Saved this new dataframe and visualized using AWS Quicksight and made Dashboards. Dashboard access/ invitation has been sent at **kouzniak@sfu.ca**
One just needs to make an account with AWS and accept the invitation to look at the interactive Dashboards. However, Screenshots of Visualization are attached below as well:

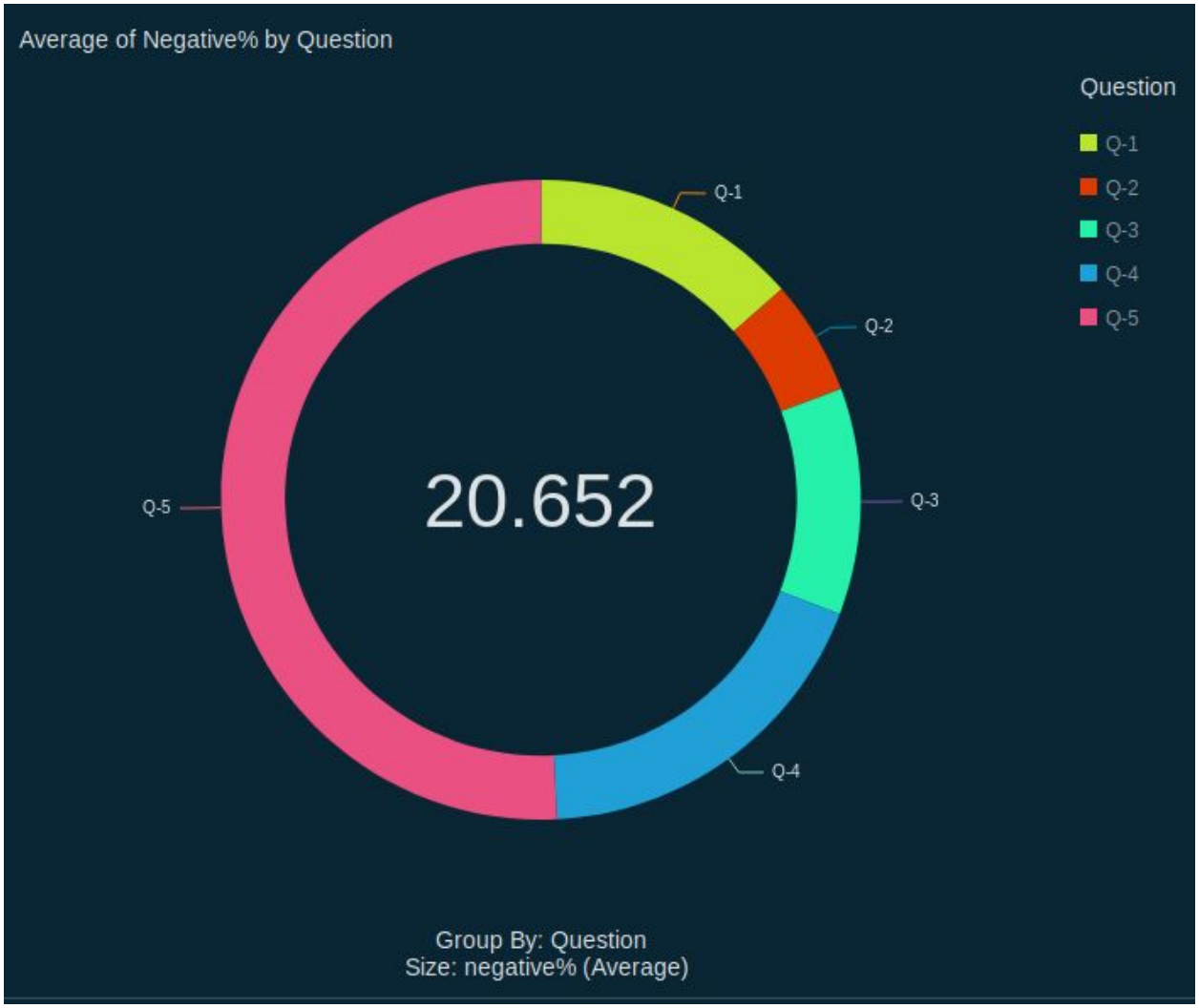

Fig. It shows Average Negative% by the Question as per responses by the students.

(Inference) Students responded *20.65% negatively to the questions on an average.*

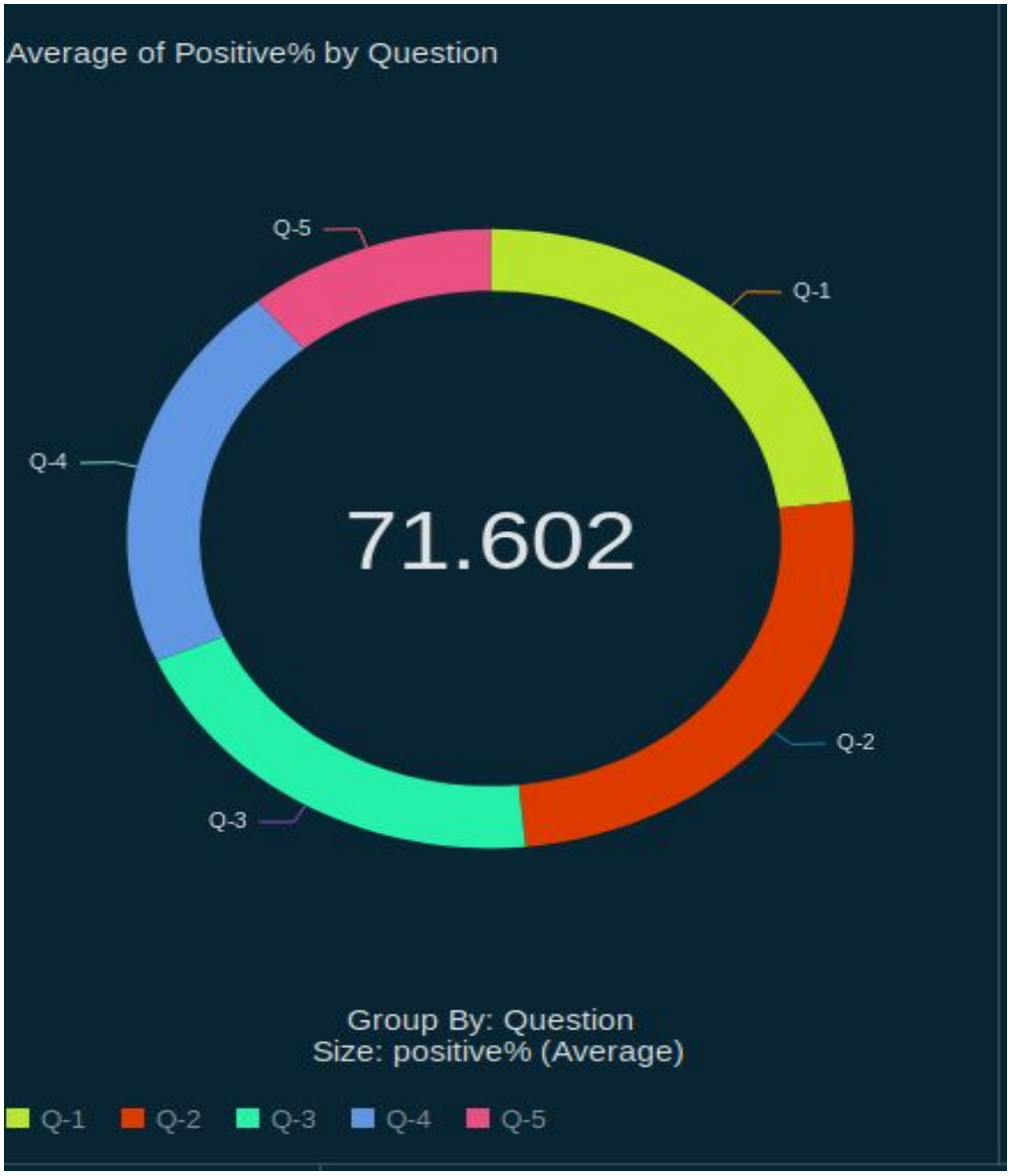

Fig. It shows Average positive% by the Question as per responses by the students.

(Inference) Students responded *71.60% positively to the questions on an average*.

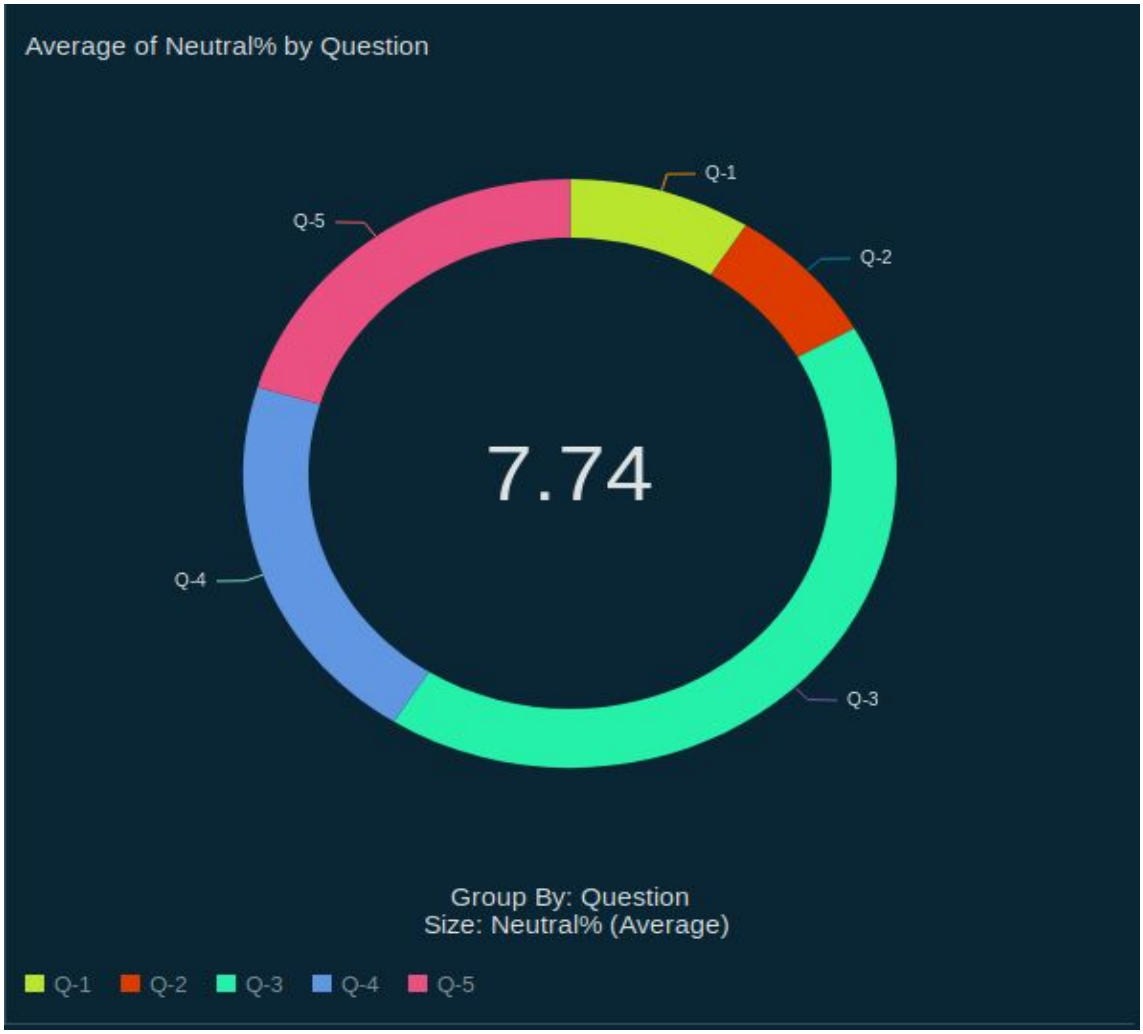

Fig. It shows Average Neutral% by the Question as per responses by the students.

(Inference) Students responded *7.74% neutrally to the questions on an average.*

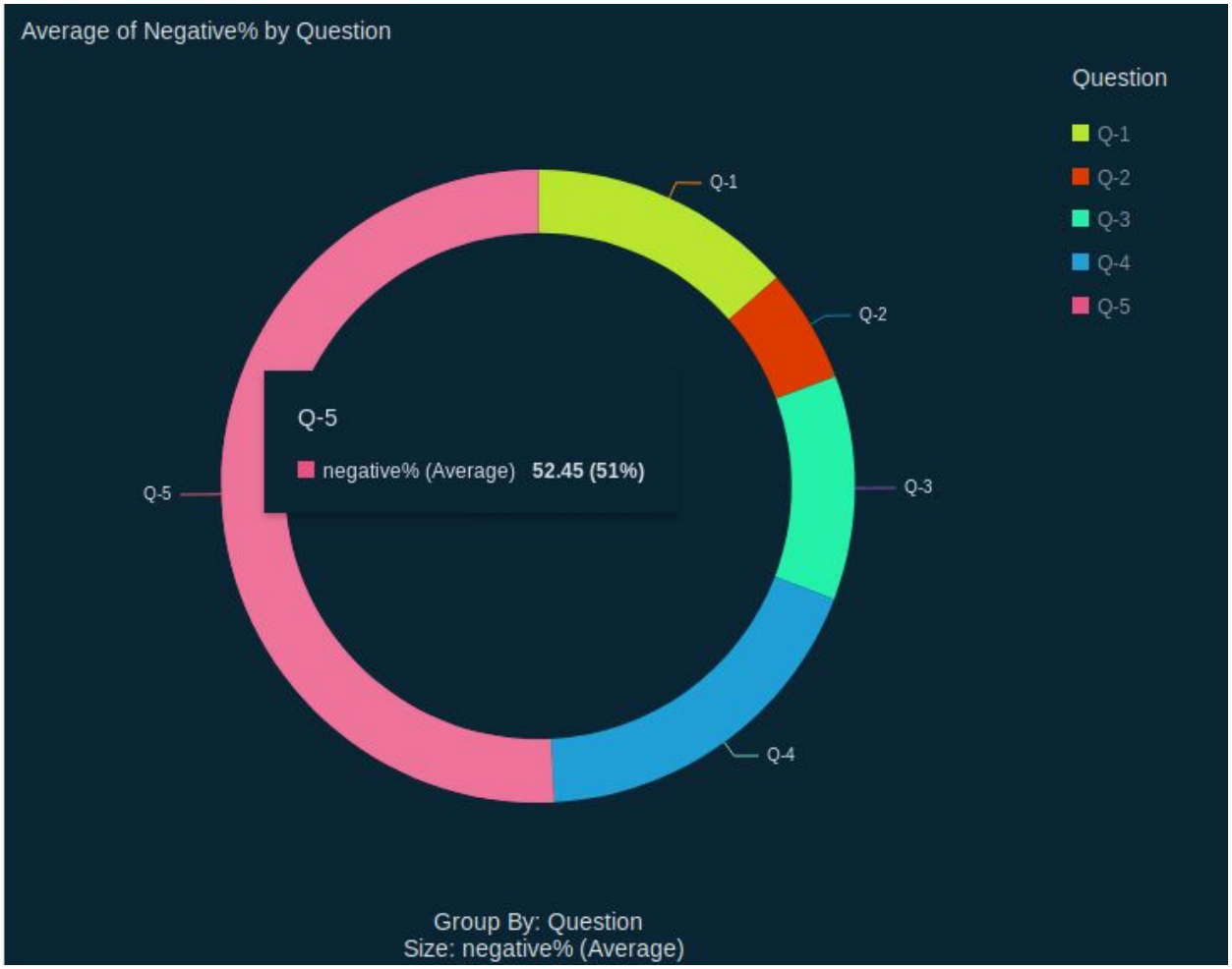

Fig. It shows that the plots were interactive if somebody hovers over any particular section. It will show the split up and the contribution per question. For instance, here, In Question-1 Students responded 52.45% negatively to this question.

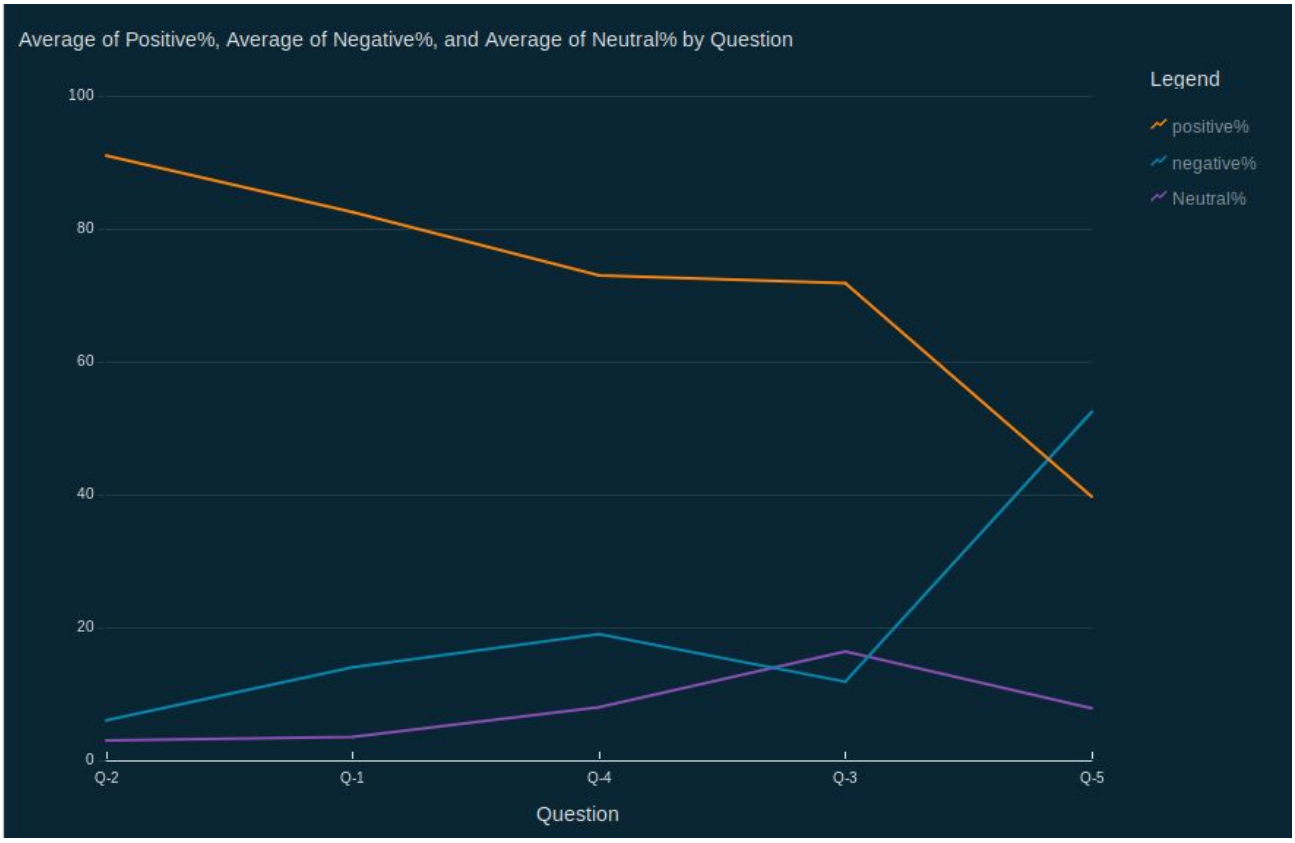

Fig. This Line chart shows the trend of the sentiment of the responses per question.

(Inference) *On question-5 there is sharp decline in the positive%*

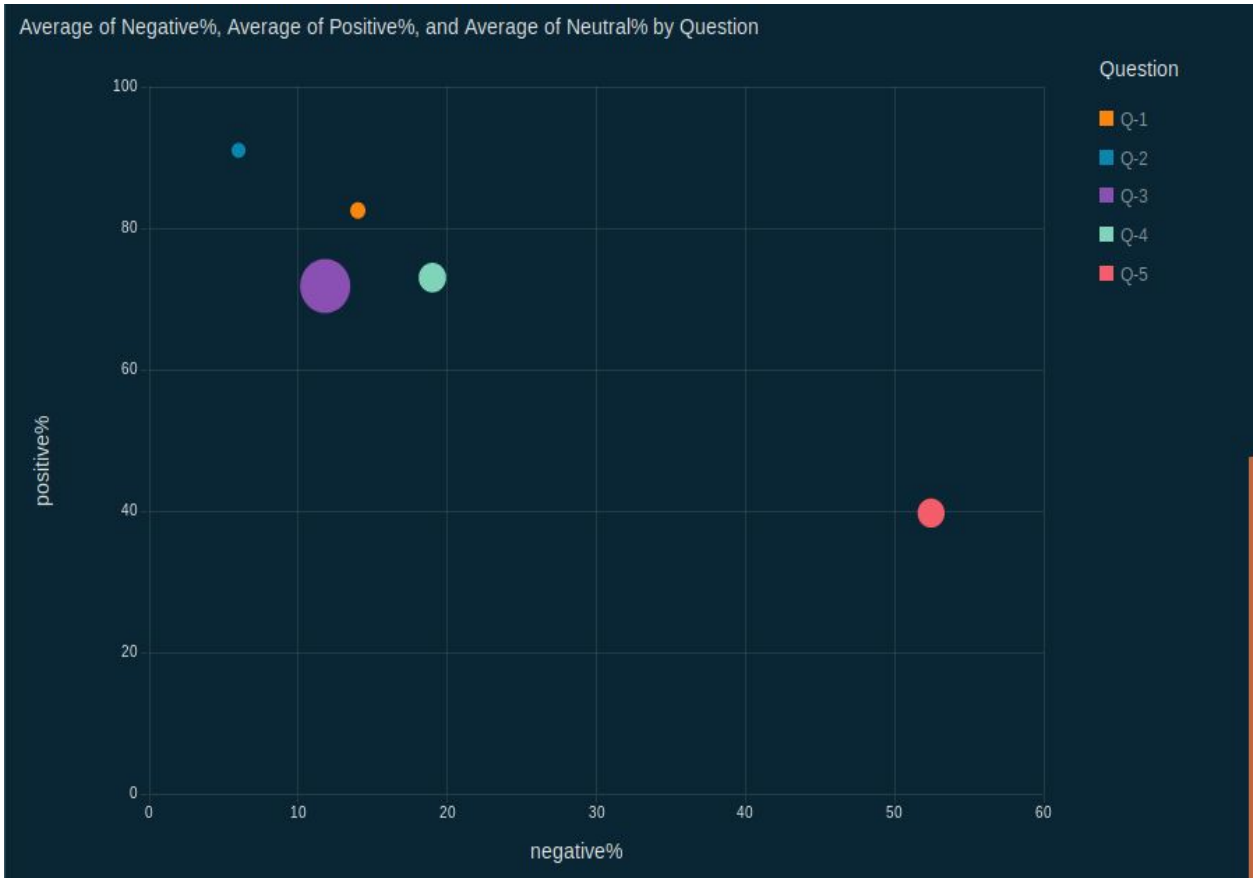

Fig. This is a Bubble Chart which is plotted against positive% and negative% with distinction by each question. Size of the bubble increases as Neutral% increases.

(Inference) *Q-5 is in right-hand side which means it is more negative. Another interesting thing to note is Q-3 was most neutrally responded by the students among all the other questions.*

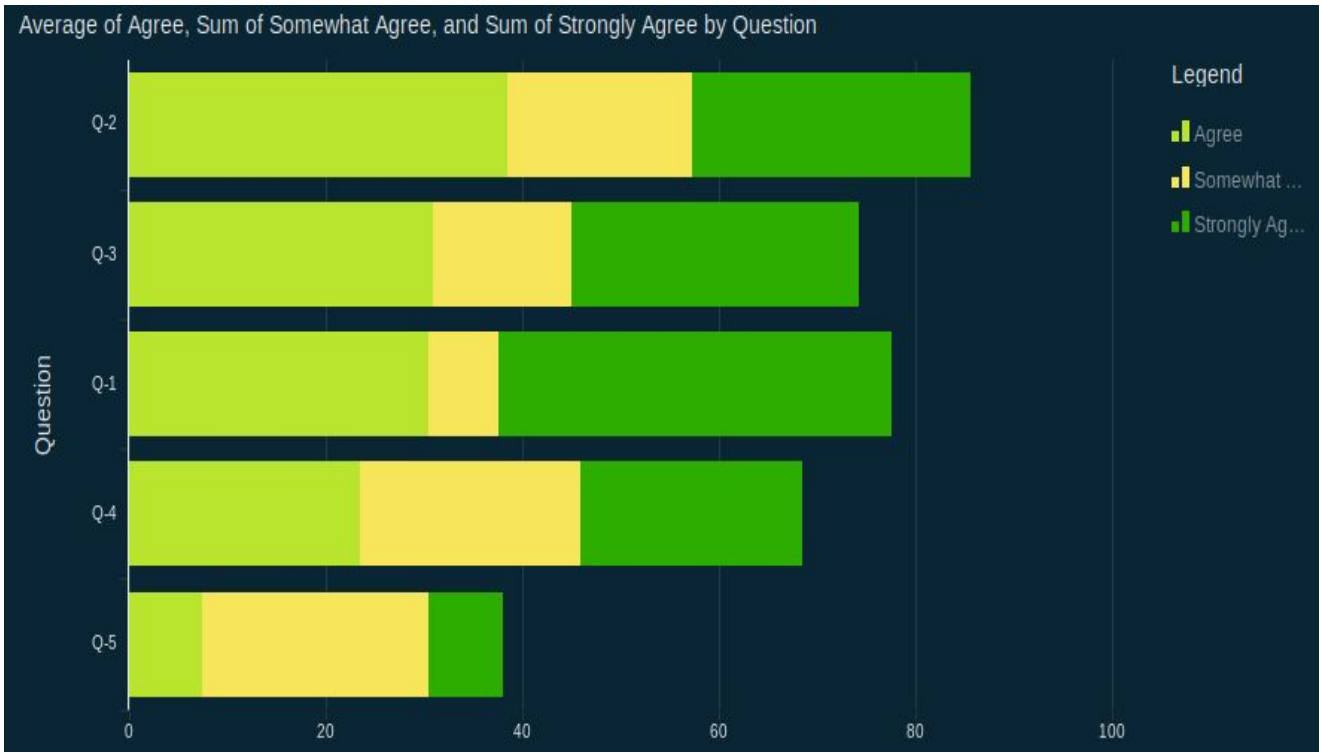

Fig. It shows positive responses of the students in a stacked bar charts per question. where gradient of colors is used to show the intensity of responses! Darker the shade of green represents more strongly student responded with Yes.

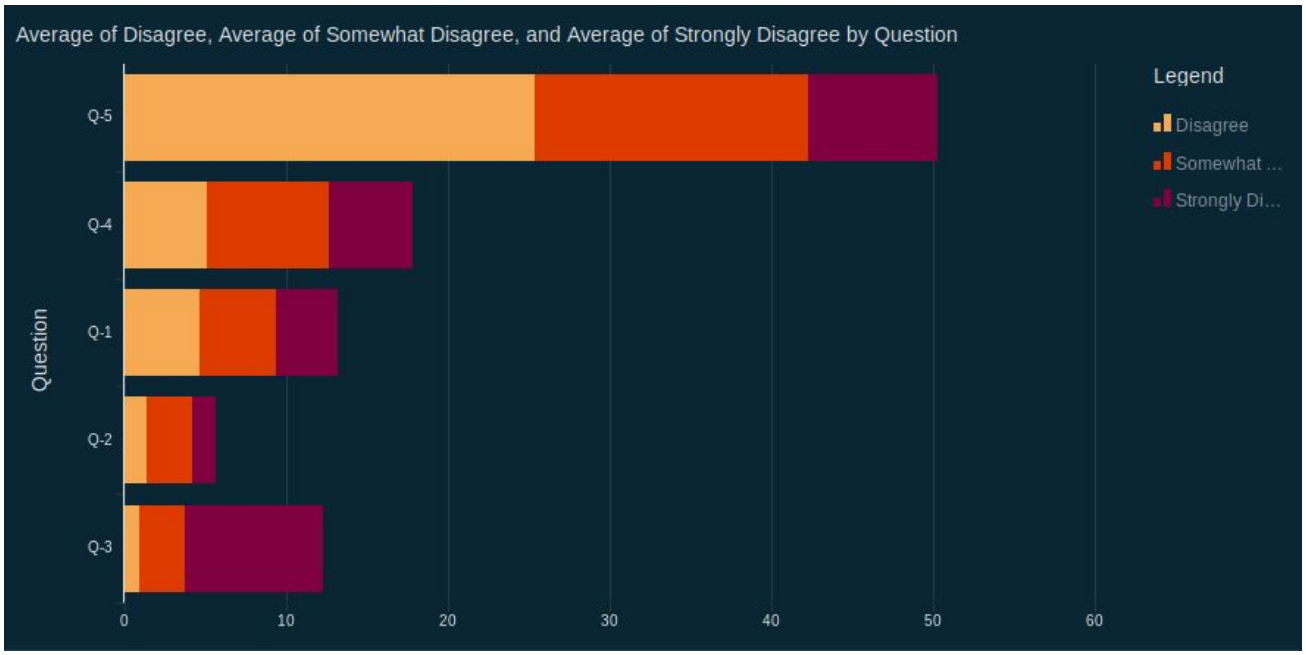

Fig. It shows positive responses of the students in a stacked bar charts per question. where gradient of colors is used to show the intensity of responses! Darker the shade of Red represents more strongly student responded with No.

After holistic Data Exploration and Visualization, I found anomaly in Question-5. Thus, I drilled down deeper to find underlying reasons.

[Quick Overview of the Survey] Statistically

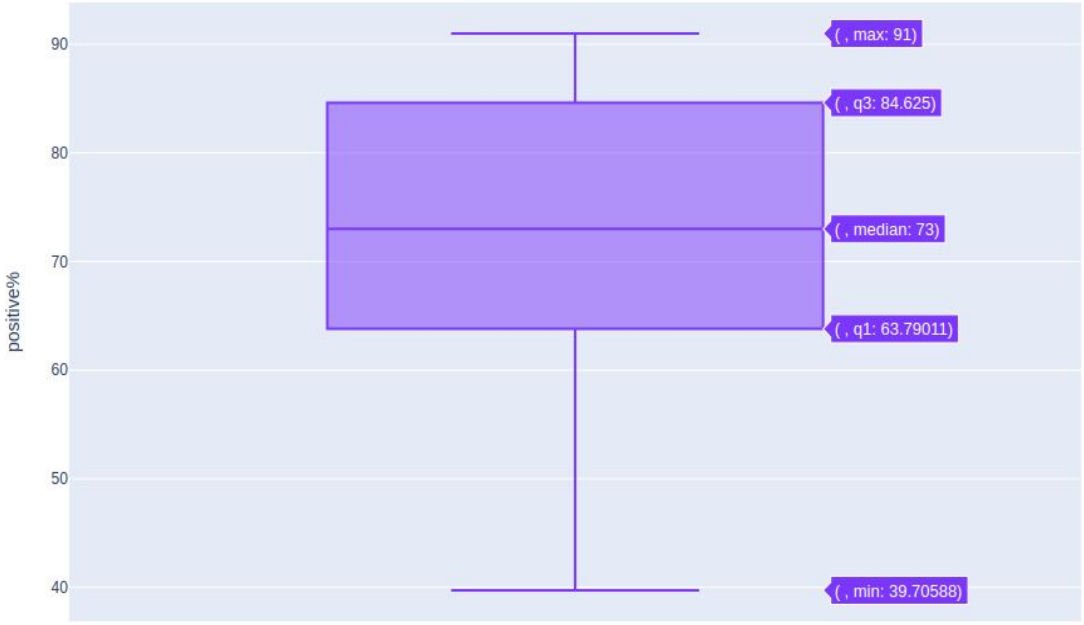

Fig. Box plot of positive responses. Line in the middle represents median.

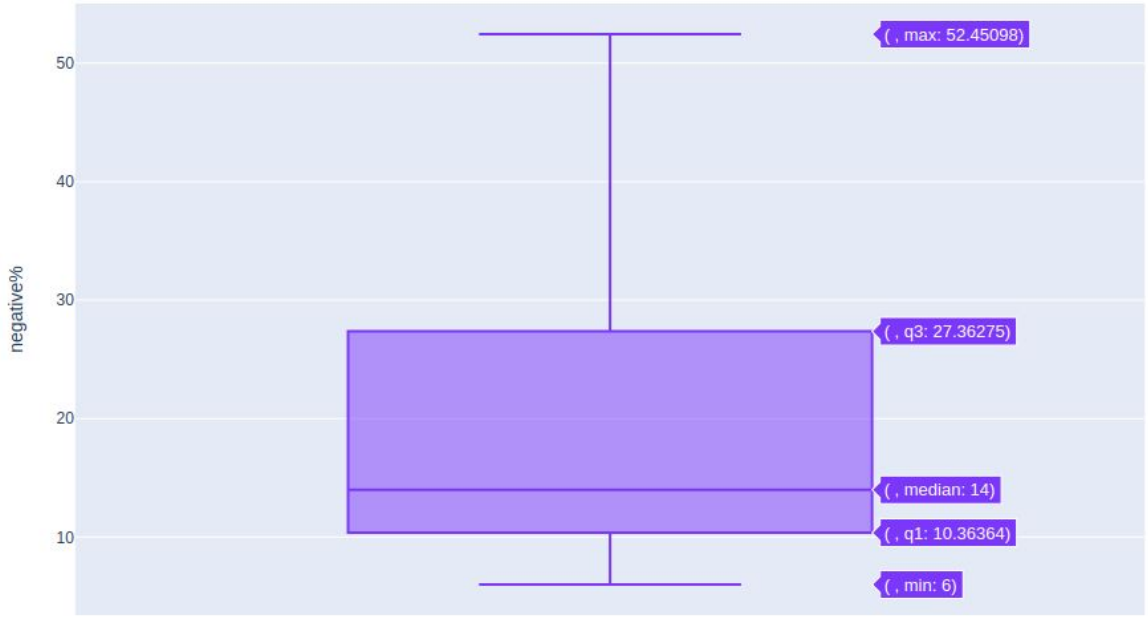

Fig. Box plot of Negative responses. Line in the middle represents median.

Exploring Q-5

Q-5 Whiteboard class is a stressful experience.

People voted negatively for this Question. But this question is already negative which means students wanted to convey opposite of this question.

=> Which Implies that Student didn't find Whiteboard class to be stressful!