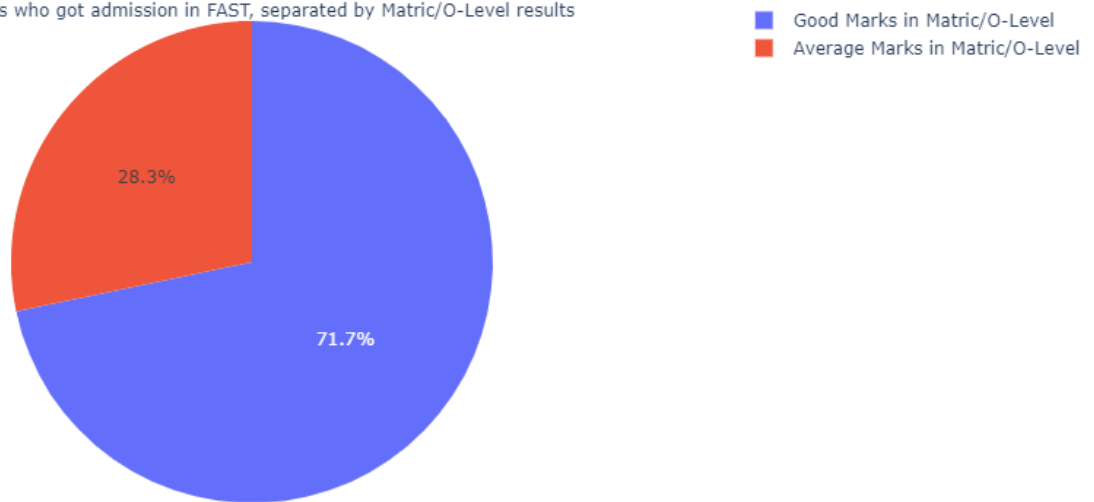


Data Analysis and Visualization

Assignment 1

1. Do the students performing good in Matric/O-level exam have a better chance of getting admission in NUCES?

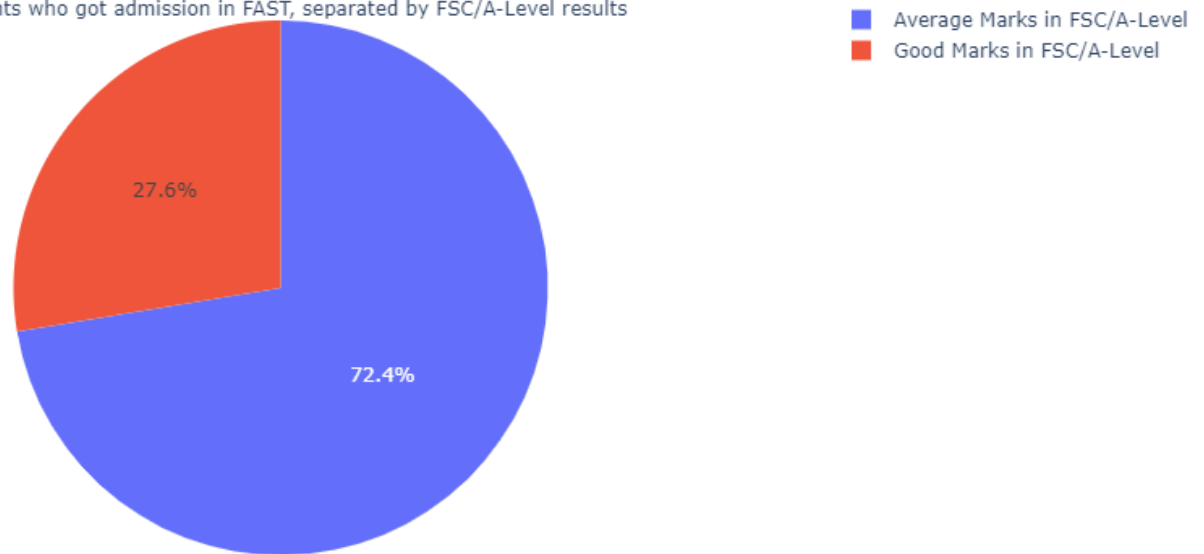
Students who got admission in FAST, separated by Matric/O-Level results



- **Assumption:** - Assuming Good Marks in Matric/O-Levels = $\geq 80\%$ Marks
- As Evidenced by the above Pie Chart, students who performed good in Matric/O-Levels generally had a better chance of getting admission in FAST NUCES, as 71.7% of the applicants who secured admission had good marks in Matric/O-Levels, while only 28.3% of applicants who got admission in FAST NUCES did not have good marks in Matric/O-Levels

2. Do the students performing good in FSC/A-level exam have a better chance of getting admission in NUCES?

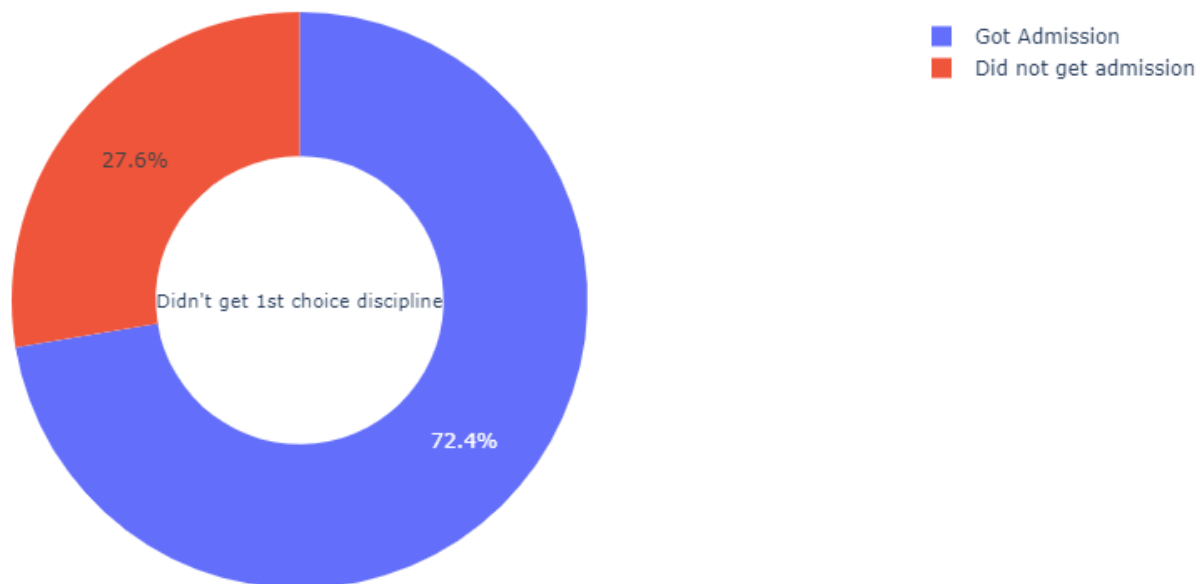
Students who got admission in FAST, separated by FSC/A-Level results



- Since F.Sc. marks data is wrong in the provided .xlsx file (as it is an exact copy of S.Sc. marks), we can derive the F.Sc. marks from the applicants NU Merit. In 2019, NUCES used the following formula for calculating a student's merit: 50% weightage to NU Test, 40% weightage to F.Sc. marks, and 10% weightage to S.Sc. marks. Since we have a student's NU Merit, we can use this to derive an applicant's F.Sc. marks
- **Assumption:** - Assuming performing good = Obtaining 80% marks in FSC/A-Level
- As Evidenced by the above Pie Chart, students who performed good in FSC/A-Level did not have a better chance in getting admission in FAST NUCES, as 72.4% of the applicants who secured admission had average marks in FSC/A-

Level (<80% marks), while only 27.6% of applicants who got admission in FAST NUCES had good marks in FSC/A-Level

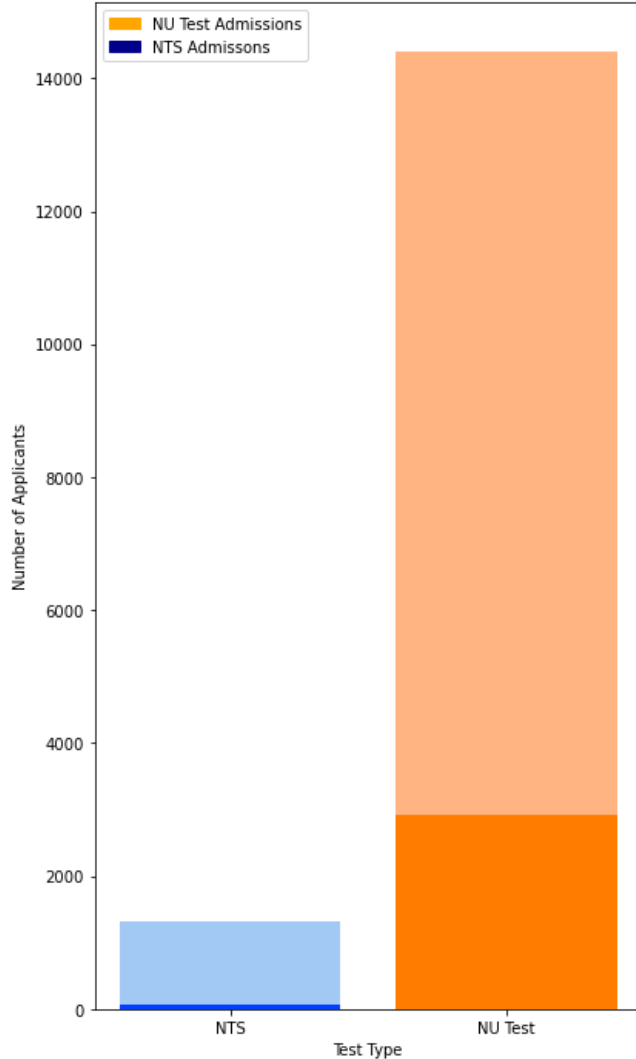
3. Do the students who could not get the first preference of their choice of discipline failed to join NUCES?



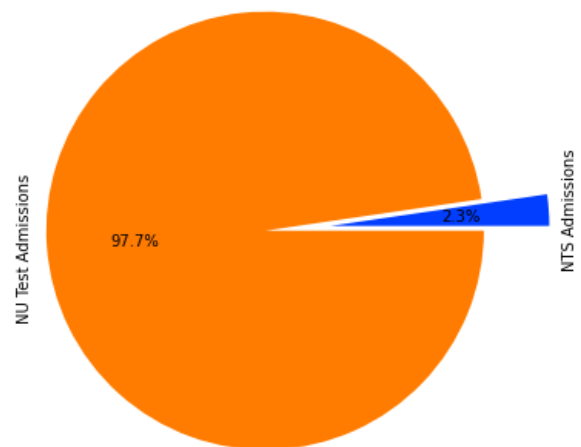
- As evidenced by the above Donut Chart, a majority of applicants who could not secure admission in their first choice of discipline (but secured admission in some other discipline), opted to get admission in FAST NUCES

4. Students who have passed the NTS exam instead of the NU test have a better chance of joining NUCES

Number of Applicants with respect to NTS and NU Test, and how many of them secured admission



Number of Admissions to FAST, with respect to NTS and NU Test Applicants

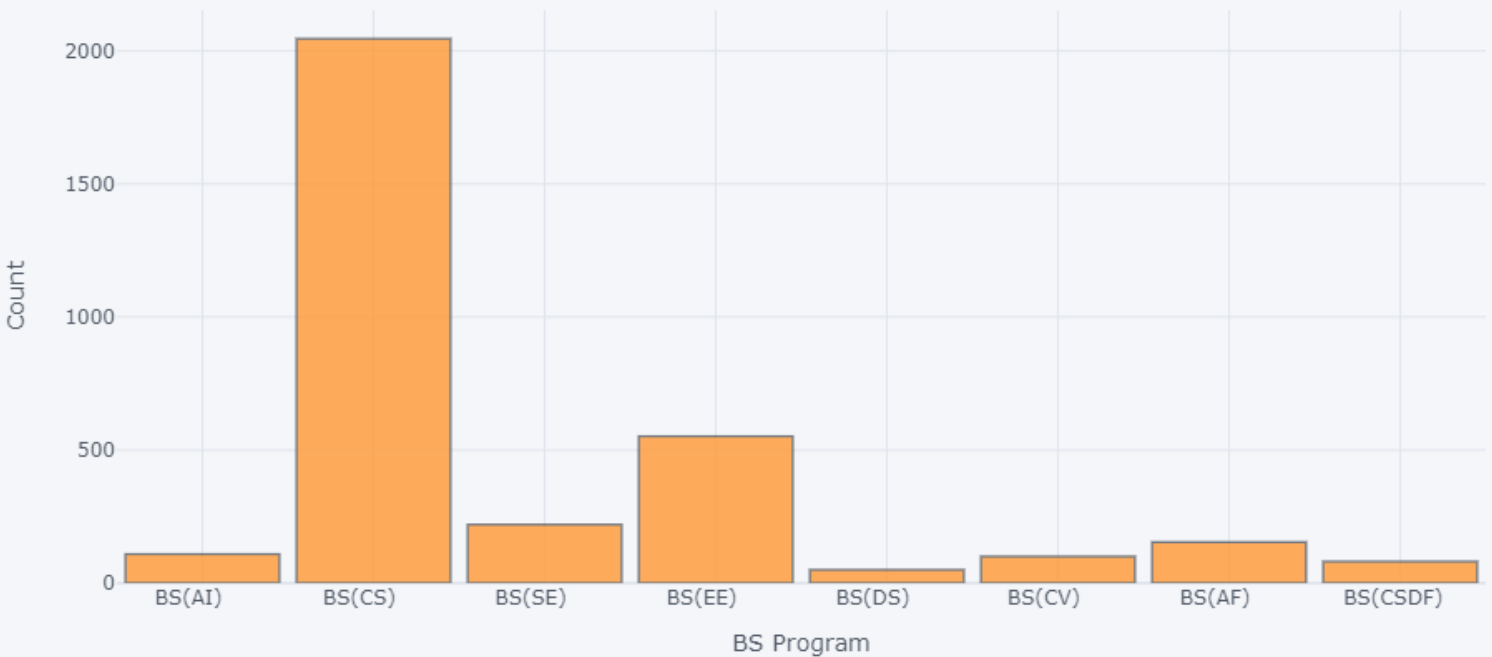


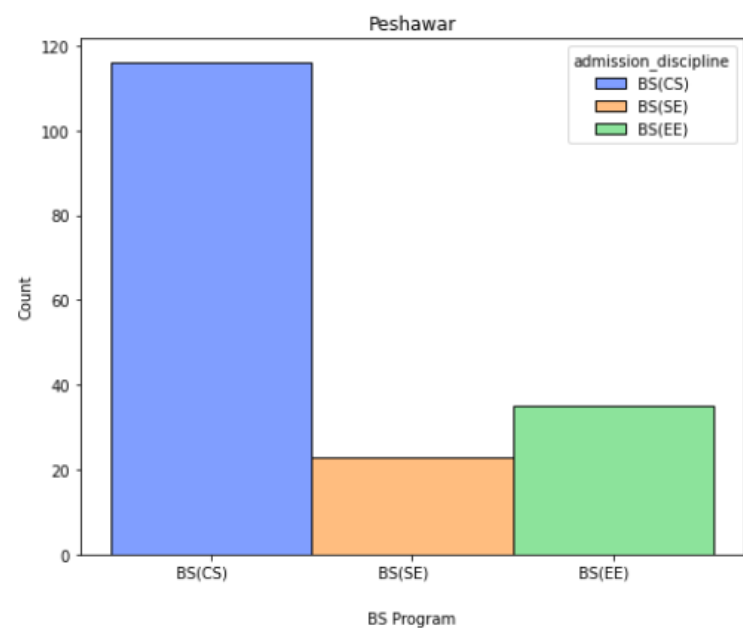
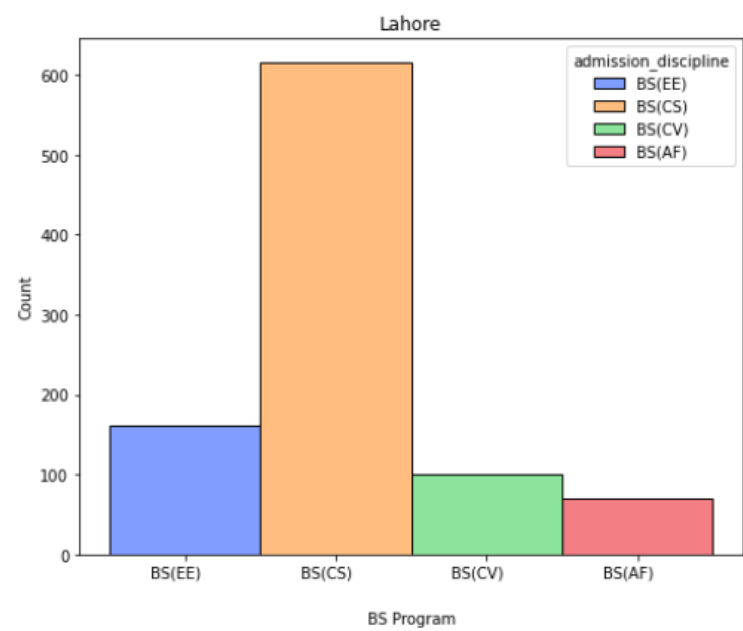
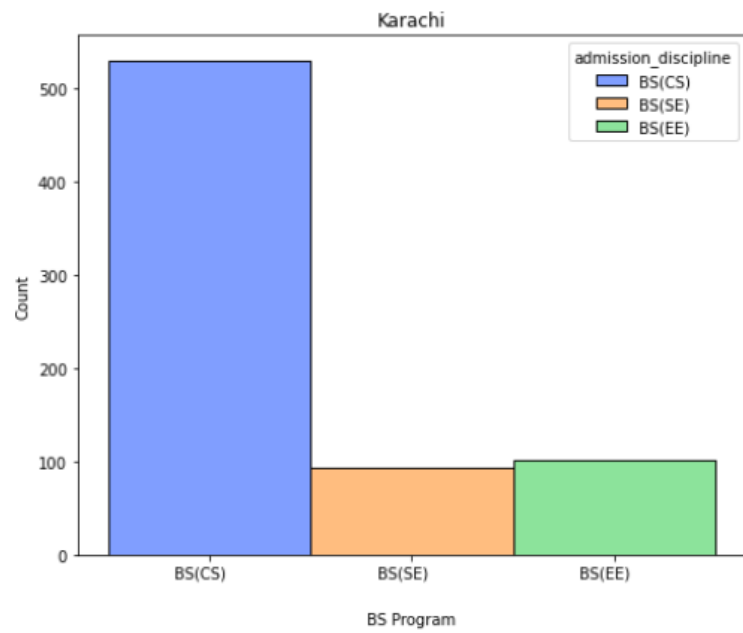
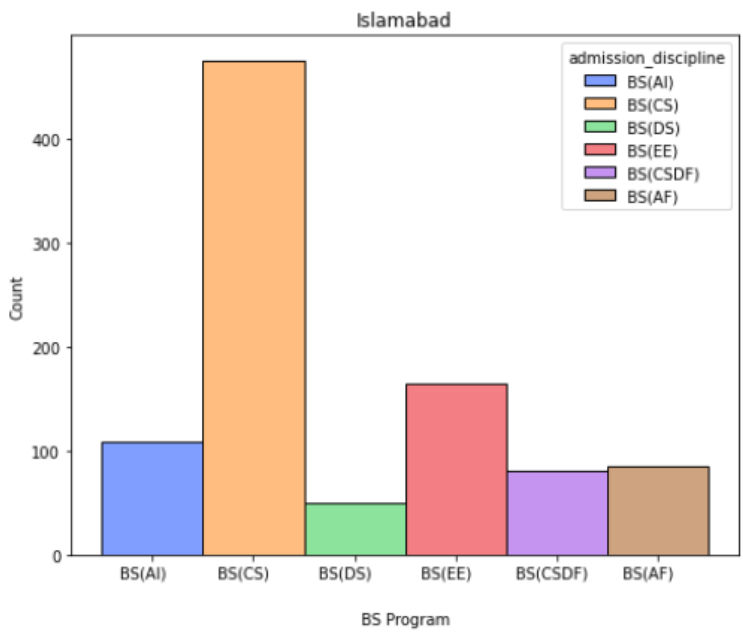
- As shown by the above graphics, Students who have passed NTS exam instead of NU Test do not have a better chance of joining NUCES. The bar chart shows the total number of applicants of both NTS and NU Test, and how many of them managed to secure admission. As can be seen in the graph, the number of applicants who managed to secure admission after giving NTS is very low (~5%), while the number of applicants who secured admission after giving NU Test was significantly higher (20%)
- Similarly, the Pie Chart displays the total number of applicants who joined NUCES, divided by people who got in through NU Test and NTS. An overwhelming

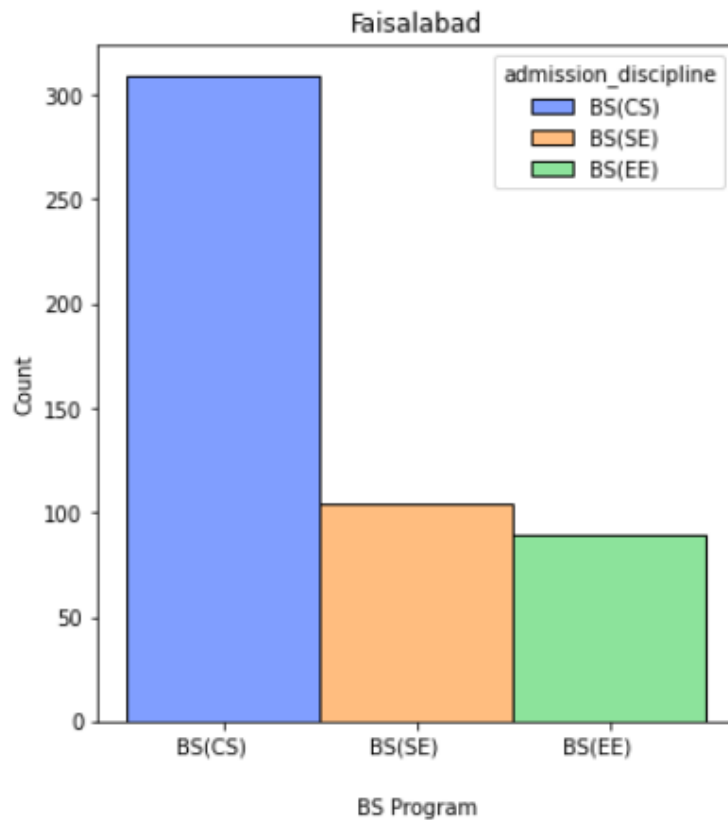
majority (~97%) of the applicants passed the NU Exam instead of NTS, while only around 2% of the applicants got in through NTS

5. Which BS program is a popular choice for admission (campus wise analysis required)

Admission Count of BS Programs (All Campuses)

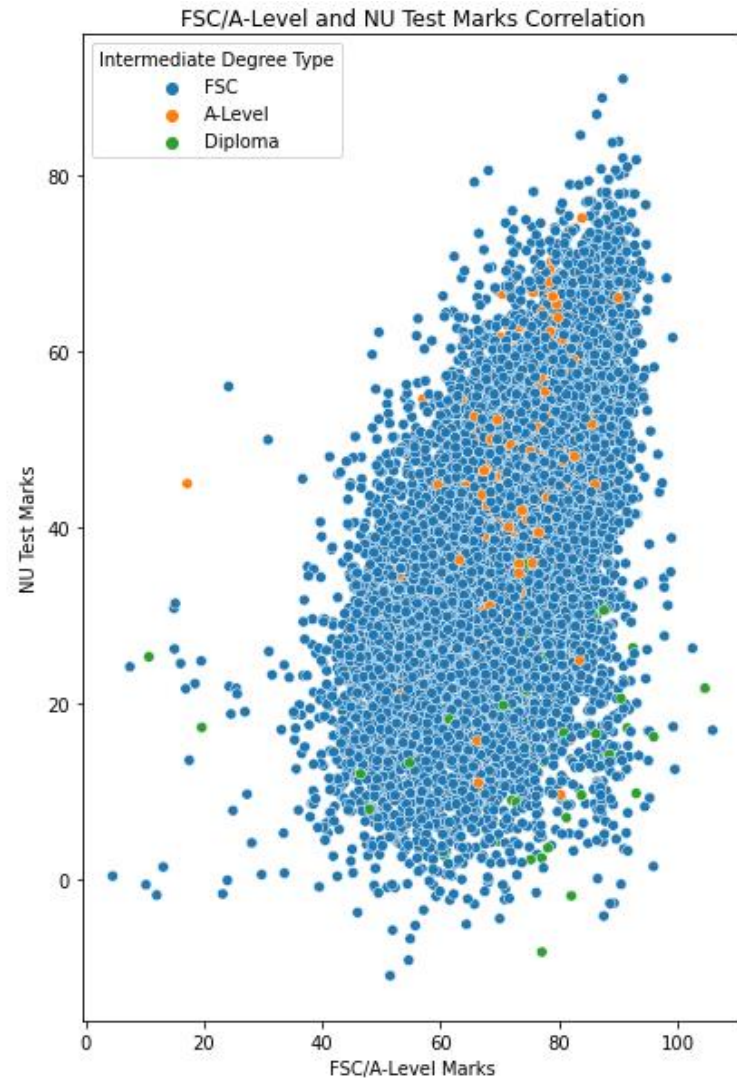
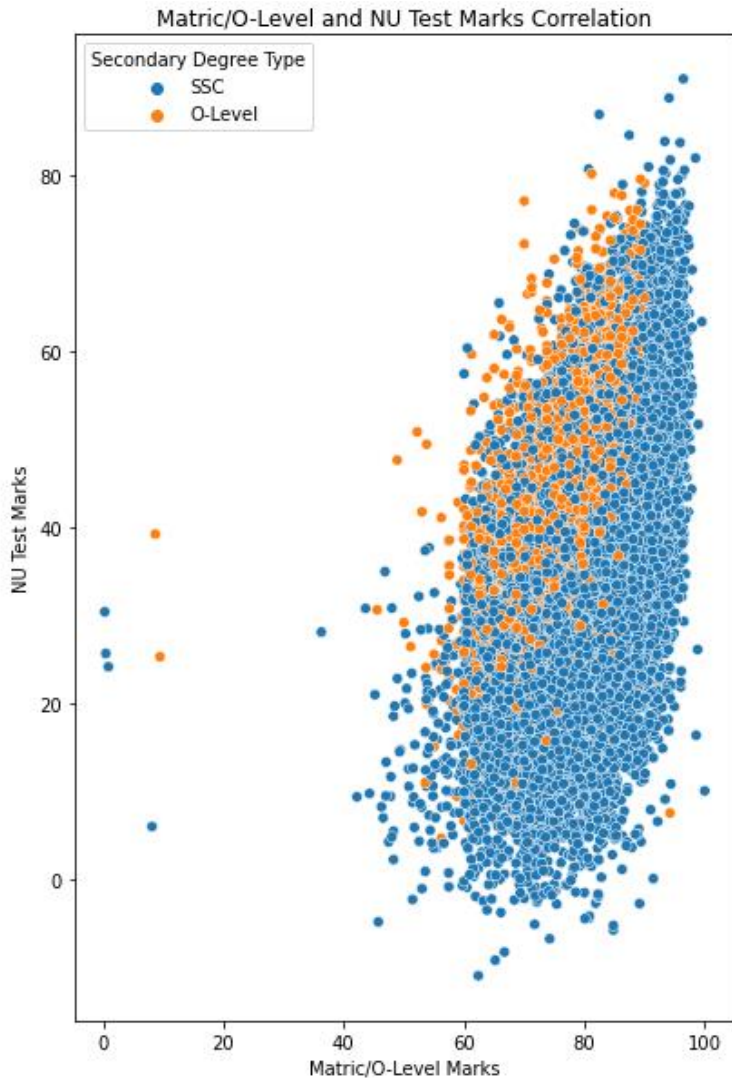






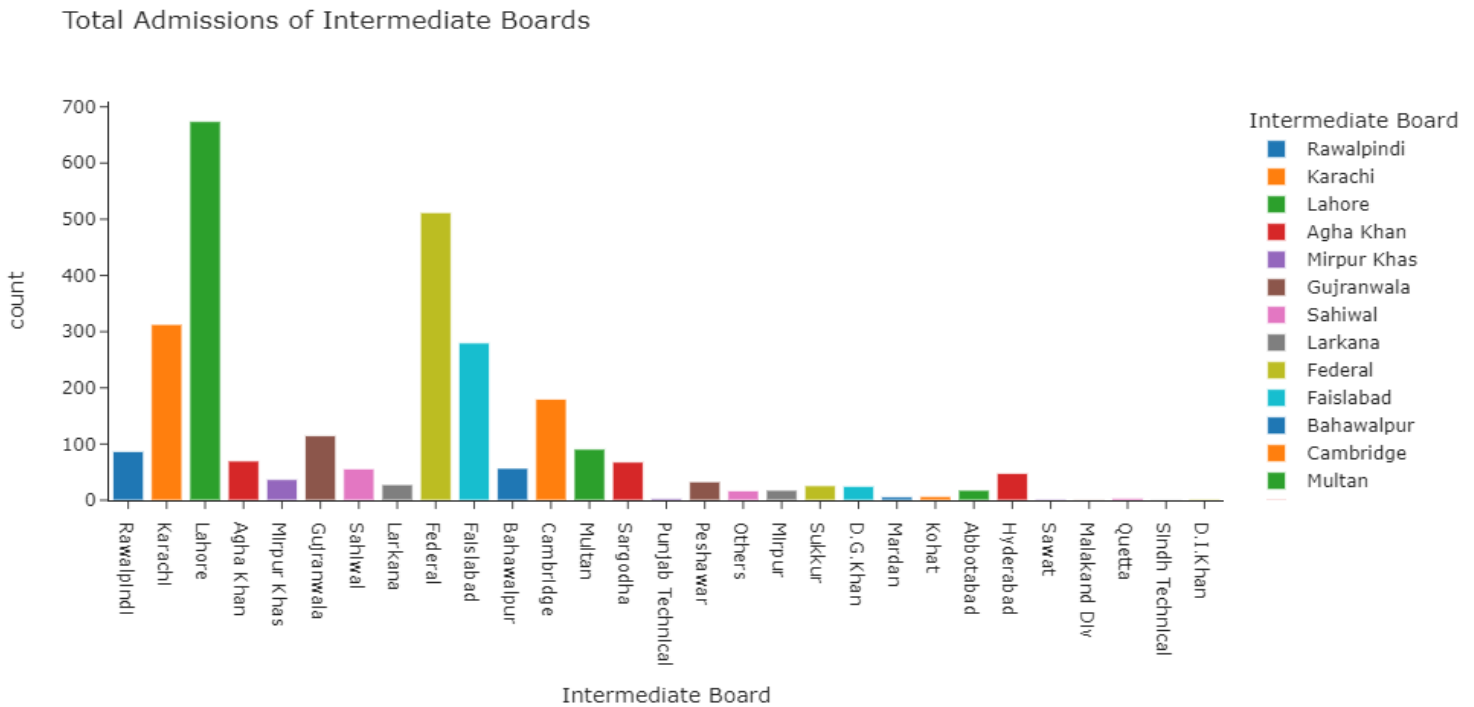
- **Assumption:** - Assumption of popular = Most admissions
- As shown by the graphs, BS(CS) is the most popular program for all campuses for admission in FAST NUCES, in 2019. I did not consider the BBA program, as I was only required to see the popularity of BS programs.
- The first bar graph shows the admission count of all disciplines of all Campuses, where it is evident that BS(CS) enjoys a substantial lead over the rest of the degree programs.
- The subplots show campus wise admissions of BS Programs, where again BS(CS) enjoys a considerable lead over all the other BS Programs (more than 100% in all cases).

6. Is there any correlation between the Matric/O-level/F.Sc./A-Level and the NU test score? (Students with the NTS test score can be ignored here)

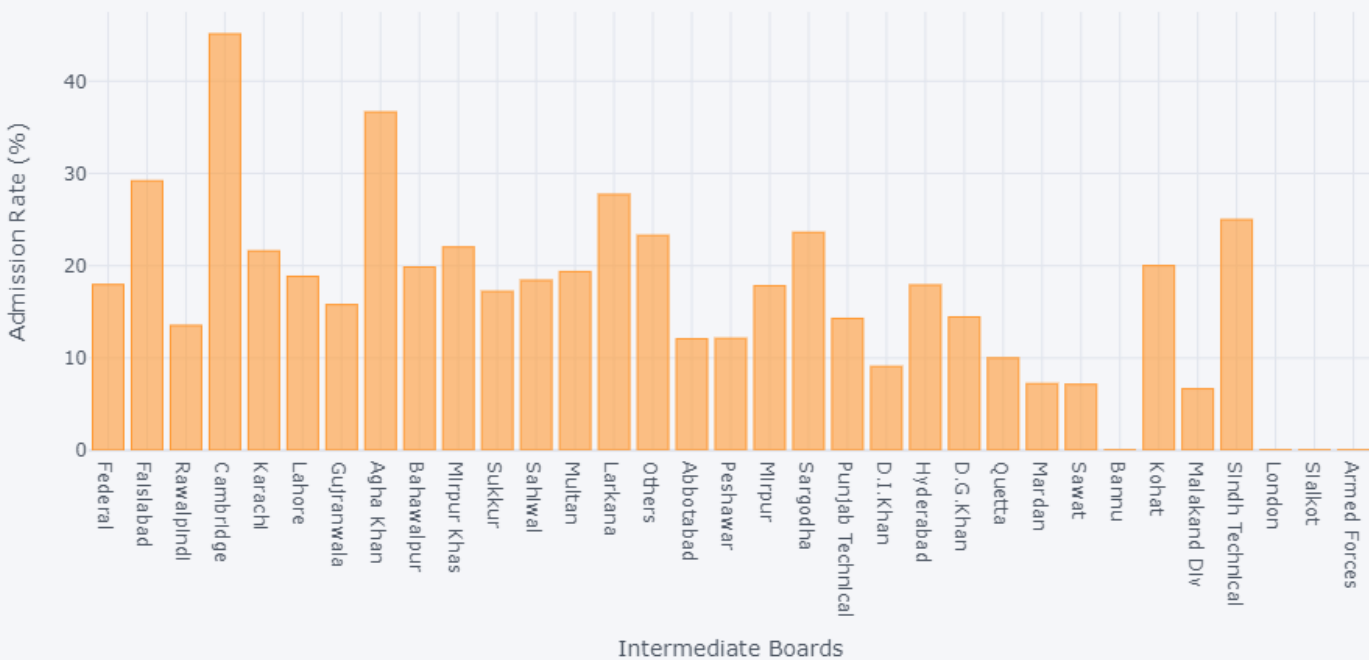


- As shown by the above Scatter Plots, there is a positive correlation between both Matric/O-Level Marks, FSC/A-Level Marks and the NU Test Marks. Moreover, even though O-Level students did not score that high in terms of percentage in their O-Level Exams, they did score higher in the NU Test as compared with their FSC peers of similar marks

7. Which Intermediate Boards were successful in getting admission in NU?

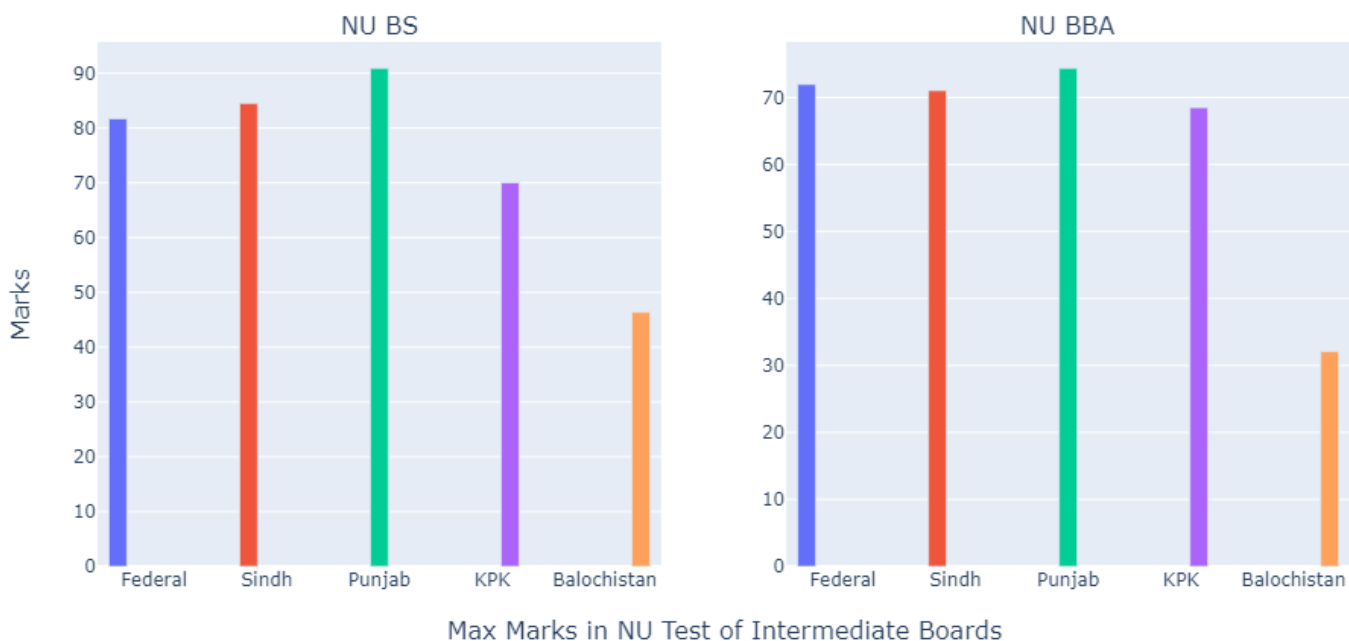


Admission Rate of Intermediate Boards (Total Applicants/Number of Applicants who get admission)

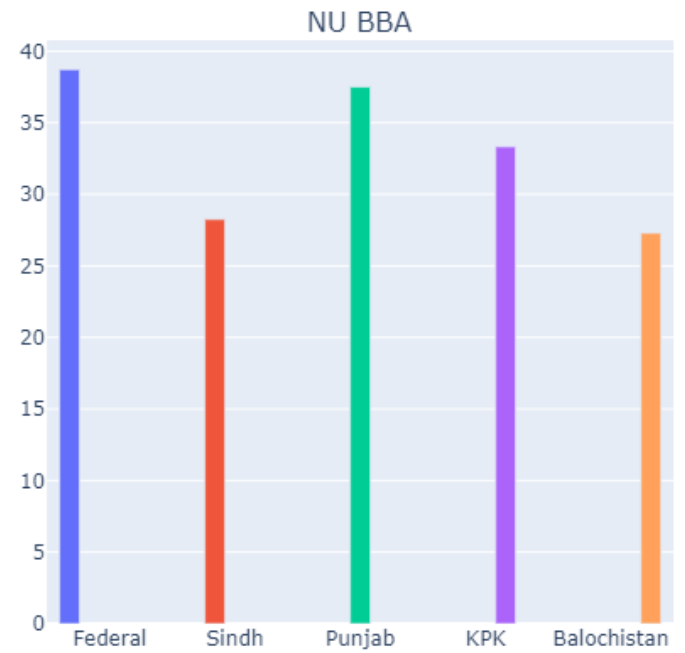
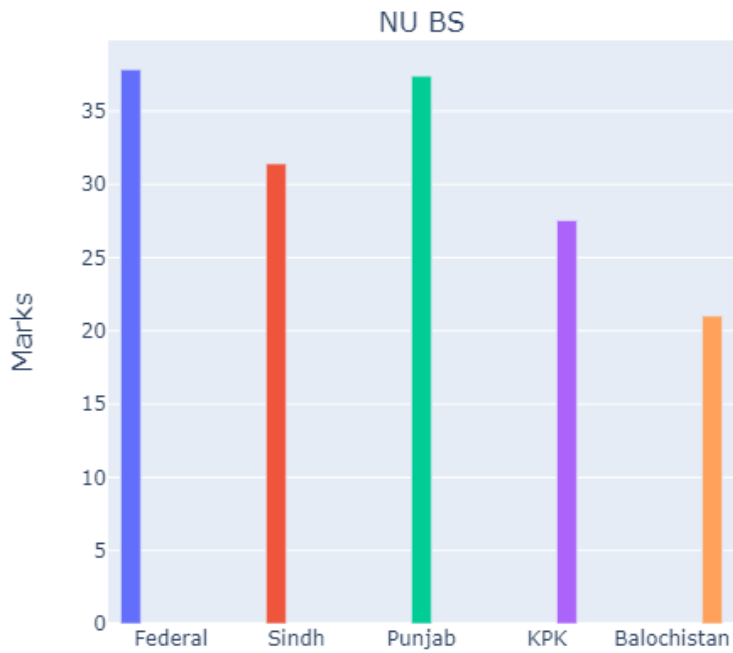


- As shown by the first graph, Lahore Board was the most successful in getting admission to NUCES, in terms of the total number of people who got selected, followed by the Federal Board.
- However, the data may be skewed a bit in Lahore Boards favor, as it had the greatest number of applicants as well. If we were to look at the success rate of the boards (i-e the percentage of people who got into NUCES from a particular board out of all those who applied from that board), the story changes. Lahore board drops out of the top 5, with Cambridge Board taking the top spot, with an impressive 45% success rate.

8. Which region's Intermediate board performed best in the NU test? You can categorize the boards into five regions (4 provinces + Federal). Is there any correlation between the Board and the performance in the NU test?

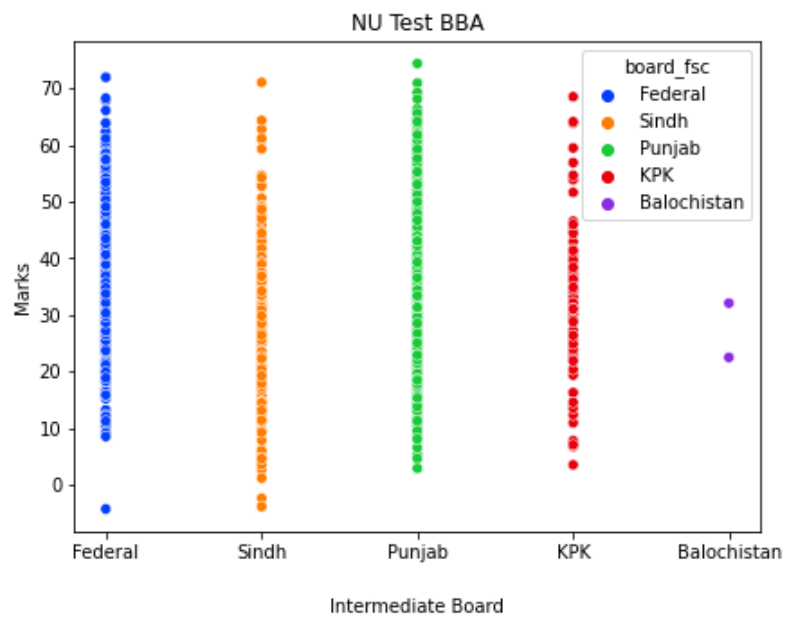
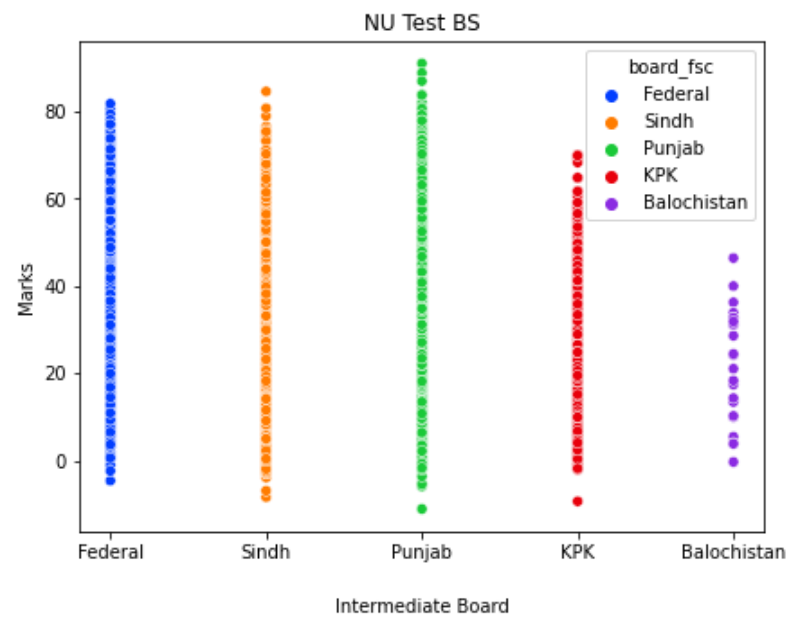


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19I-1865



Average Marks in NU Test of Intermediate Boards

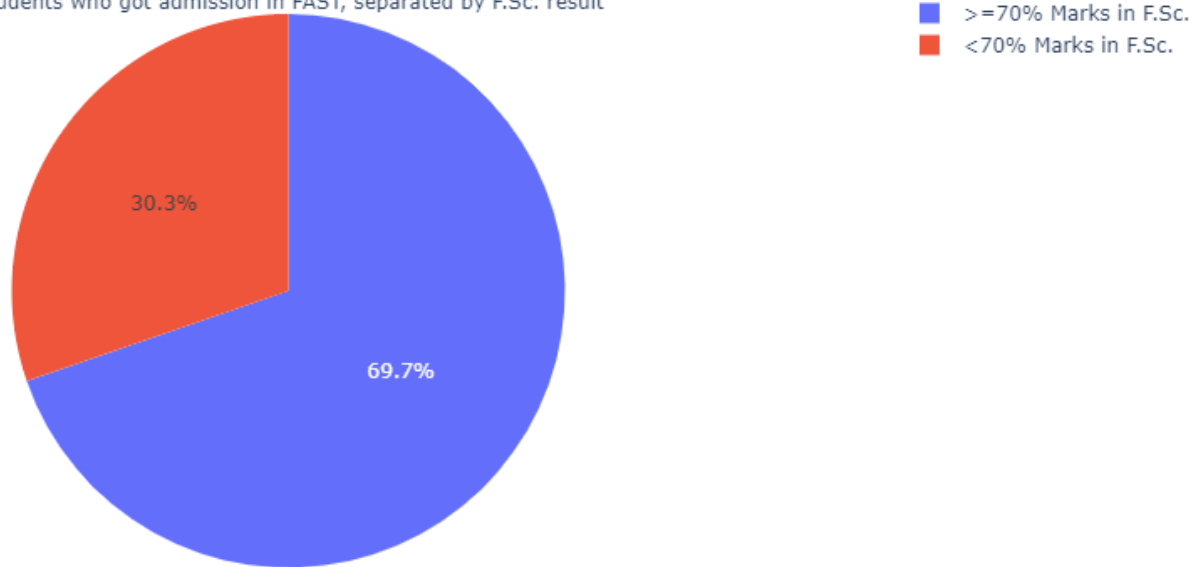
Marks of Intermediate Boards in NU Test



- Punjab Intermediate Board obtained the highest marks in both the NU BS and NU BBA test. However, if one was to look at the average marks obtained by the respective boards, the Federal Board tops the Punjab board and comes out on top (in both the tests i-e NU BS and NU BBA), albeit with a smaller margin. Even though Punjab Board had the highest marks, Federal Board showed more consistency, hence we can say that Federal Board scored the best in the NU Tests.
- Federal board and Punjab board students may have been performing better due to them having a higher quality of life, and a higher income, enabling them more advantages in terms of studying (more tuition options, better schools etc.).
- There seems to be a correlation between the Board and the Performance in the NU Test, as displayed by the two above Scatter Plots. Candidates in Punjab and Federal Boards tend to score on the higher side, while candidates in Sindh and Balochistan Board score considerably lower, while candidates from Sindh and KPK are in between Federal, Punjab and Balochistan

9. It was commonly believed that NU gives admission to students with at least 70% marks in F.Sc. Do you concur with this hypothesis based on the given data?

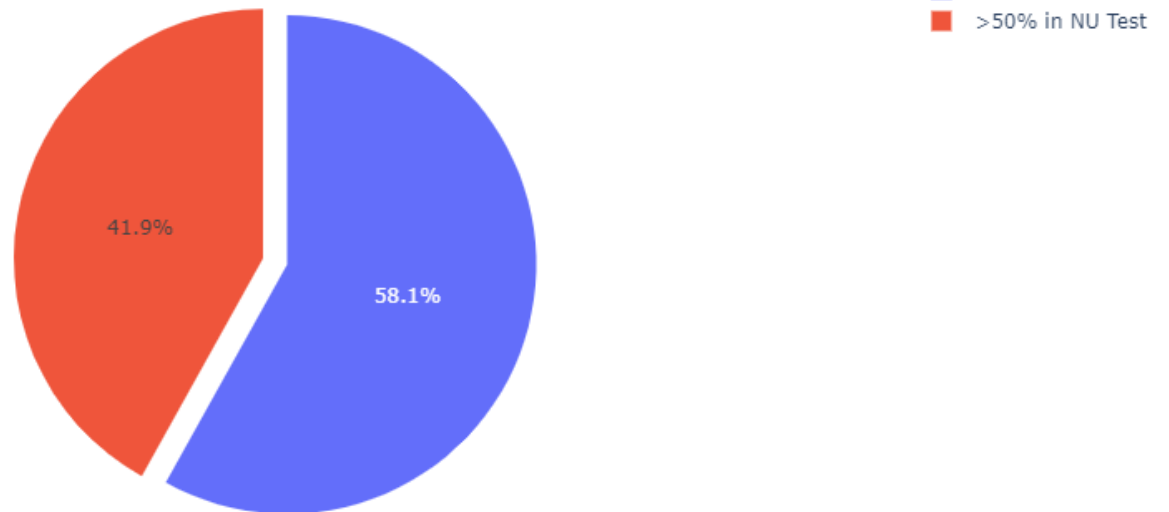
Students who got admission in FAST, separated by F.Sc. result



- **Assumption:** - Since F.Sc. marks data is wrong in the provided .xlsx file (as it is an exact copy of S.Sc. marks), we can derive the F.Sc. marks from the applicants NU Merit. In 2019, NUCES used the following formula for calculating a student's merit: 50% weightage to NU Test, 40% weightage to F.Sc. marks, and 10% weightage to S.Sc. marks. Since we have a student's NU Merit, we can use this to derive an applicant's F.Sc. marks
- While it is somewhat true that NU gives admission to students with at least 70% marks in F.Sc. (as evidenced by the above pie chart where 69.7% of applicants who got into NUCES had at least 70% marks in F.Sc.), it isn't anything steadfast, as a substantial amount of people who got into NUCES (30.3%) had less than 70% marks in F.Sc.

10. Administration was told that all applicants given admission in NU had scored more than 50% in NU test. Administration is skeptical about this claim. Can you accept or reject it based on the given data?

Students who got admission in FAST, separated by NU Test Marks

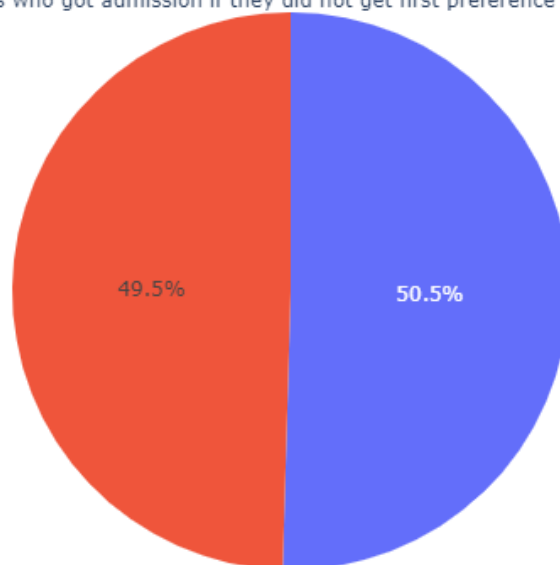


- I'll reject the claim stating that all applicants given admission in NU scored more than 50% in NU Test, as the above Pie Chart clearly shows that the majority of applicants who got admission in NU (58.1%) scored less than 50% marks in NU Test

Questions (10): These marks will be awarded to the student who has identified two more important/interesting questions (other than above 10 questions) and answers them. We shall decide the importance of the question(s) raised.

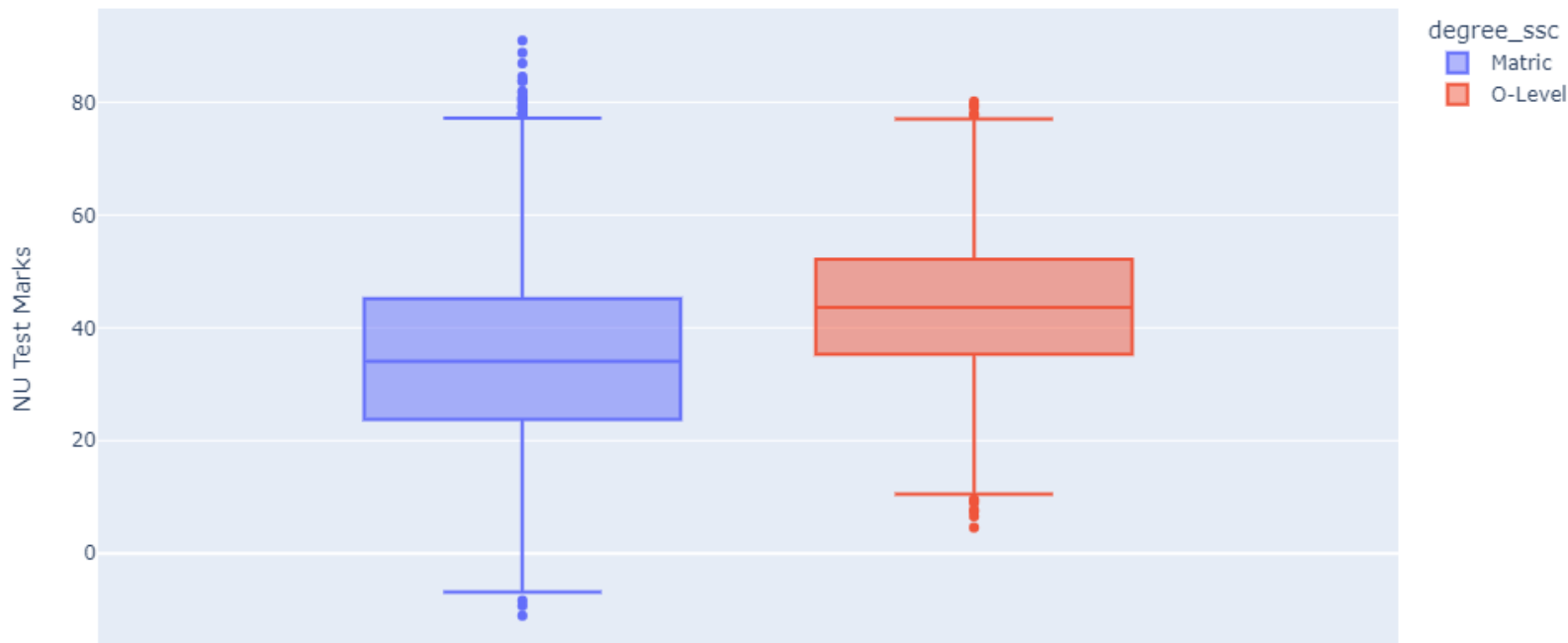
- 1. Question: Do the students who could not get the first preference of their choice of CAMPUS failed to join NUCES?**

Students who got admission if they did not get first preference of campus



- As Evidenced by the above Pie Chart, students who did not get admission in their first preference of campus (but got admission in some other campus), generally opted to get admission that campus. Out of all the applicants who could not get admission in their first preference of campus (but got admission in some other campus), more than 50% of them opted to get admission in some other campus.

2. Question: Do O-Level students score higher on NU Test as compared with Matric students?



- As shown by the above Box Plots, O-Level students tend to score higher in the NU Test as compared to Matric students (average of 43, compared with 34 of Matric students, almost a full 10 points ahead), even though Matric students had a higher maximum number of marks. Moreover, Matric students had more outliers in the data, whereas marks of O-Level students in the NU Test are generally less 'unstable', as can be seen clearly in the Box Plot.