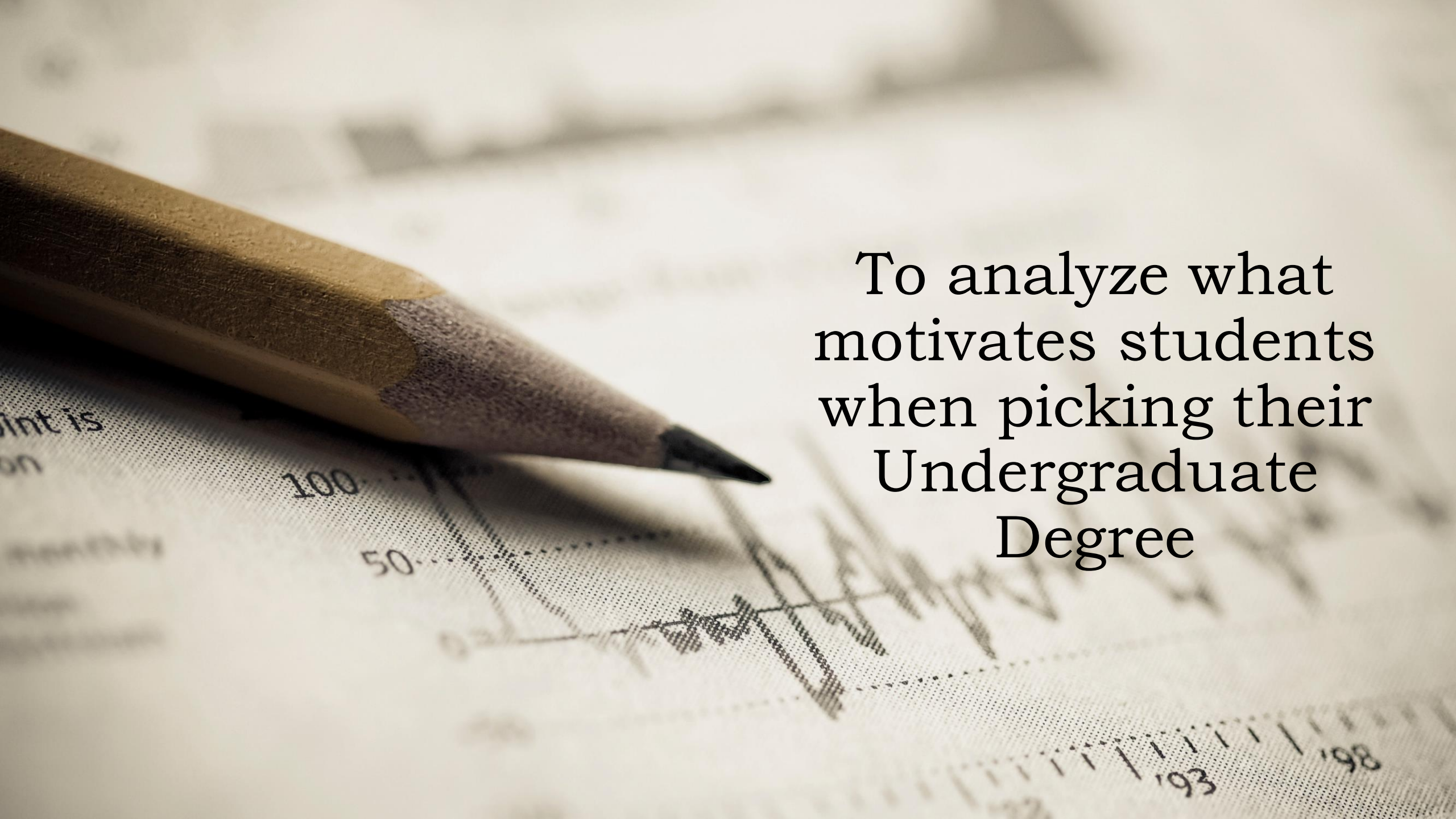


To analyze what motivates students when picking their Undergraduate Degree

OBJECTIVES

- To understand what factors- Personal interest, Parents' influence, Career Prospects, Course Content, Institute, and Recommendations from teachers/friends, play an important role when students choose their Undergraduate course.

- To find if the chosen subject aligns with their future career or educational goals.
- To find out if career counselling had an impact on the student’s choice.
- To find out whether students are content with their choice or have any second thoughts and the reasons for the latter.
- To find out if the students took a gap year and the possible reasons for the decision.
- To understand what attracts a student to enrol into an institution and how involved the parents were throughout the entire process (from choice of course to admission into an institute).

METHODOLOGY

PURPOSE – To Study The Factors That Influence Students In Choosing Their Undergrad Majors

SAMPLE – 307 Students from Bangalore

RESEARCH INSTRUMENT – Questionnaires

SOFTWARES USED – R, Power BI & MS Excel

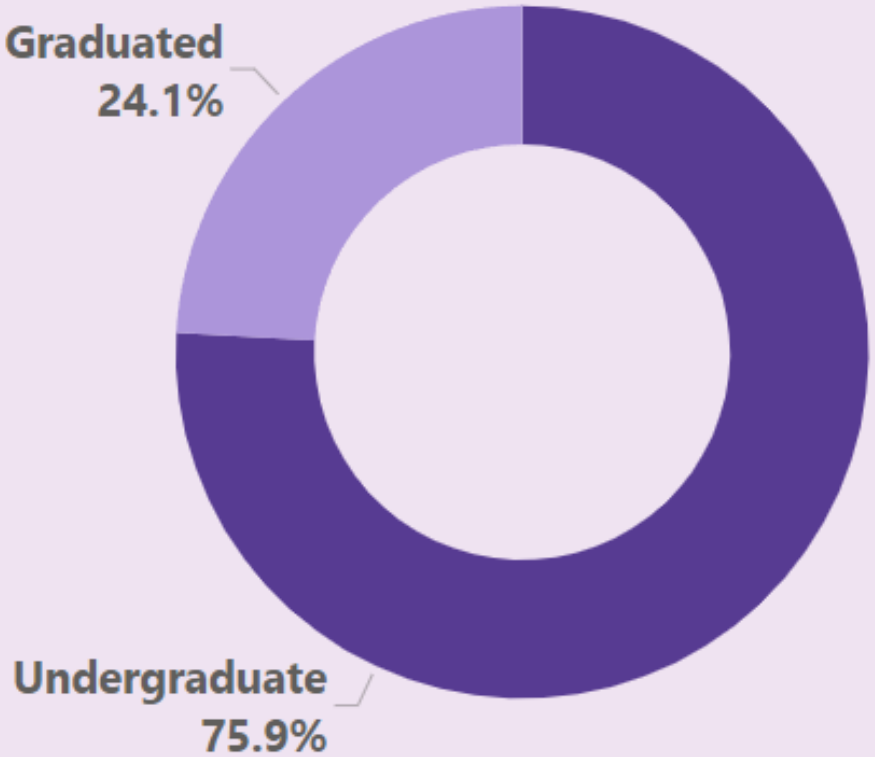
DESCRIPTIVE ANALYSIS

PILOT STUDY

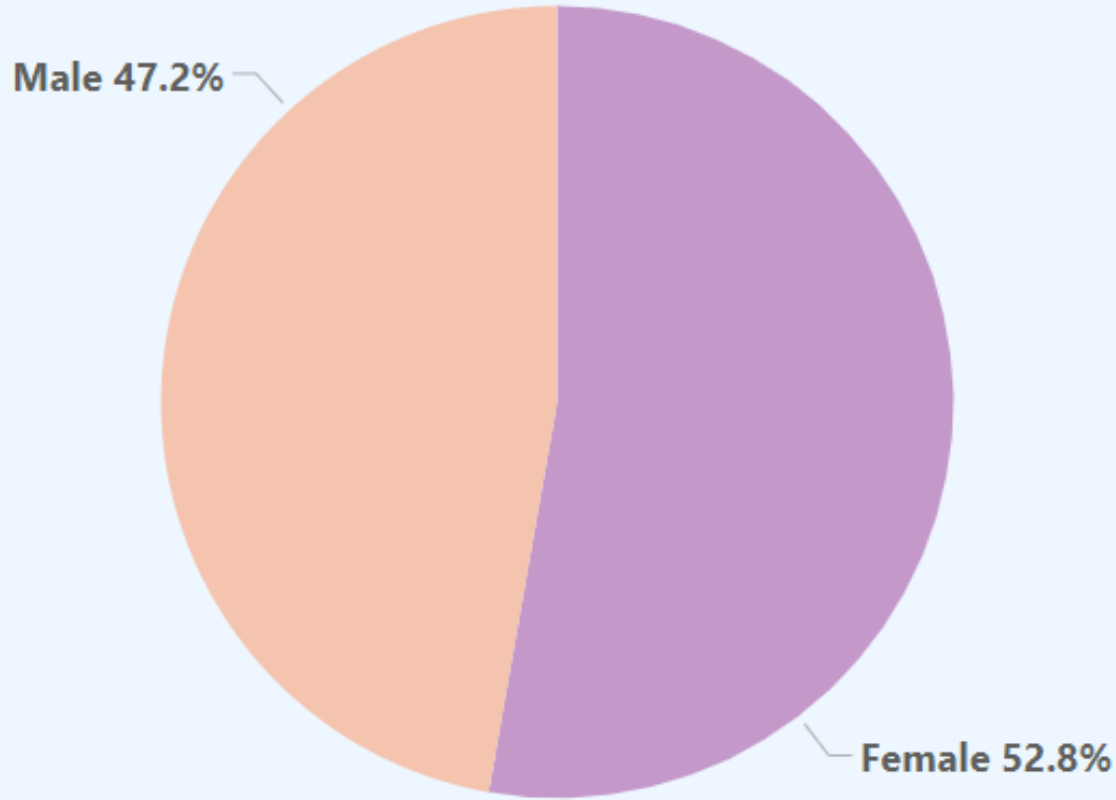
To Analyze what motivates students when picking their Undergraduate Degrees

This survey is being conducted by the third-year students of B.Sc. Statistics, Computer Science, Mount Carmel College as their 5th semester Statistics - Paper 5 research project. Your responses will be confidential and will be used for study purposes only.

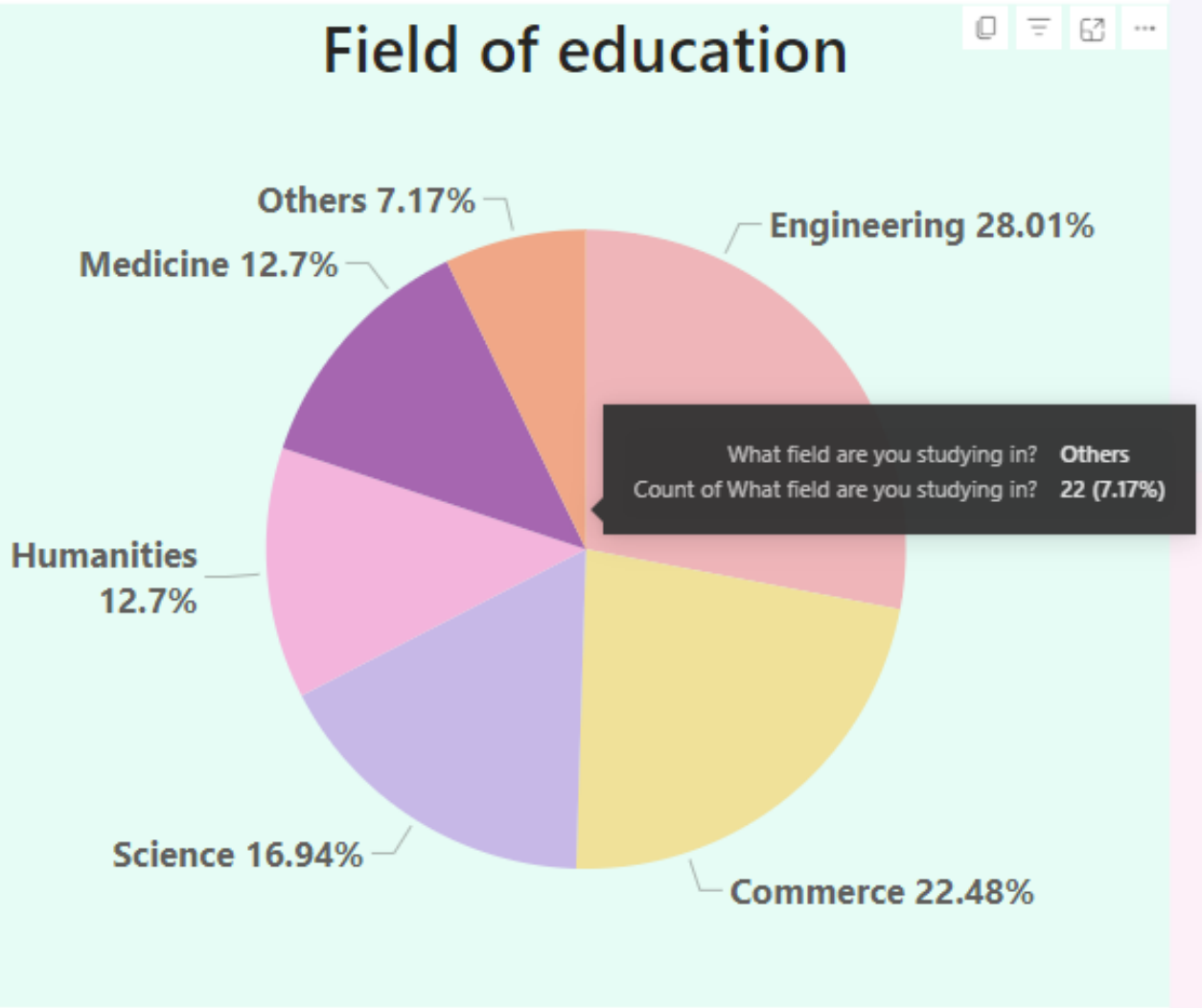
Educational Qualification of the sample units

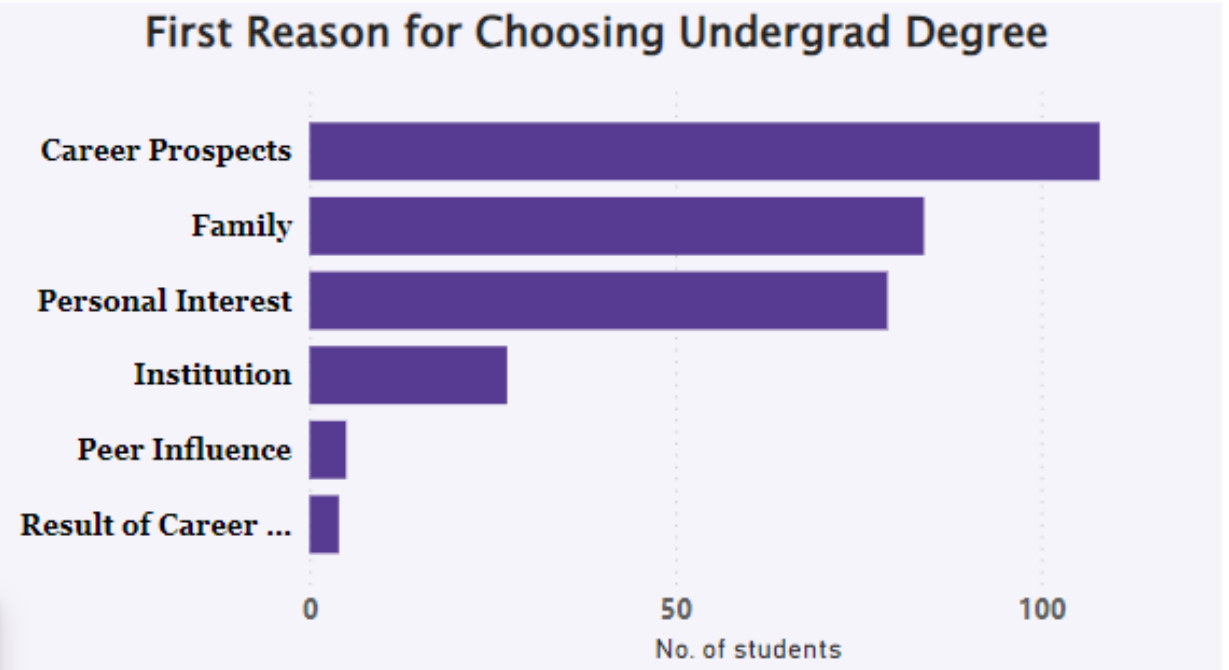


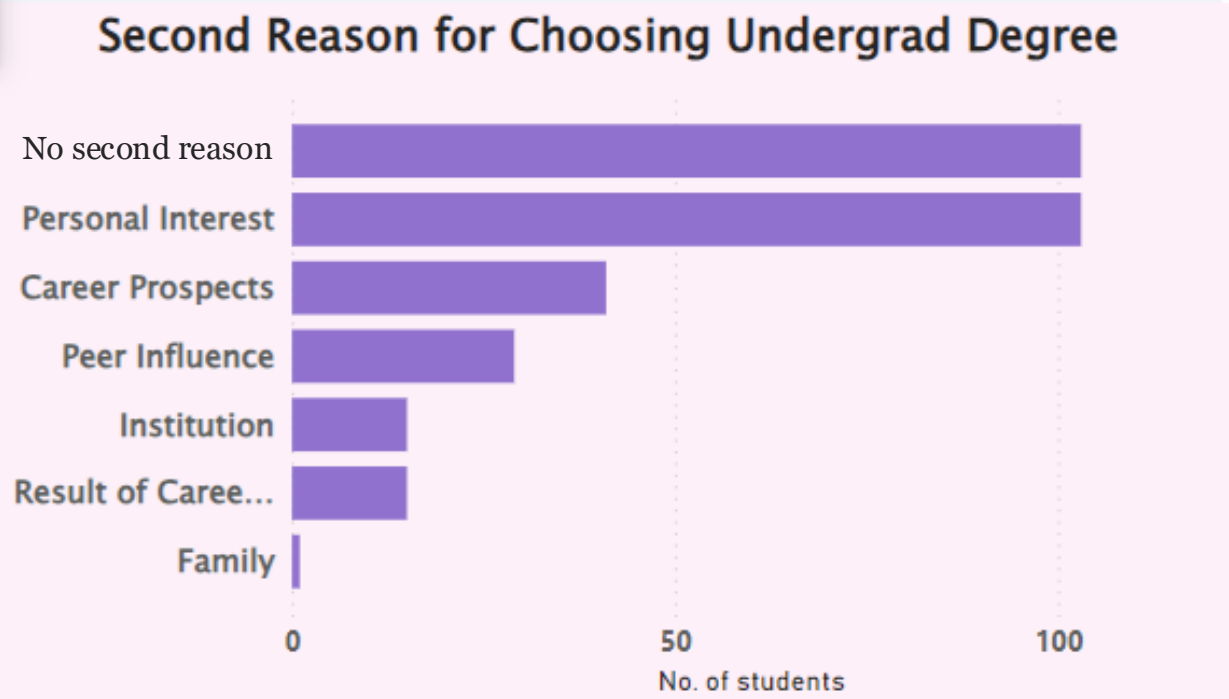
Gender Distribution in the Sample



Filters

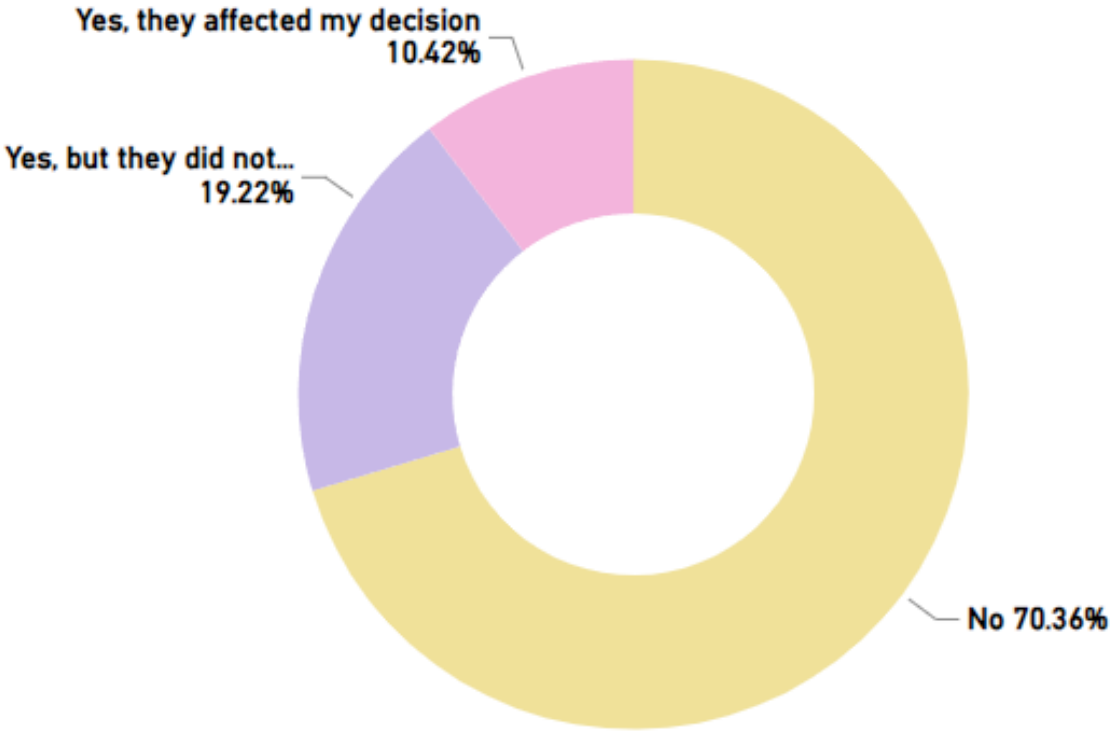

Field of education
Others 7.17%
Engineering 28.01%
Medicine 12.7%
Humanities 12.7%
Science 16.94%
Commerce 22.48%
What field are you studying in? Others
Count of What field are you studying in? 22 (7.17%)


First Reason for Choosing Undergrad Degree
Career Prospects
Family
Personal Interest
Institution
Peer Influence
Result of Career ...
0
50
100
No. of students


Second Reason for Choosing Undergrad Degree
No second reason
Personal Interest
Career Prospects
Peer Influence
Institution
Result of Caree...
Family
0
50
100
No. of students

Filters

Career counseling

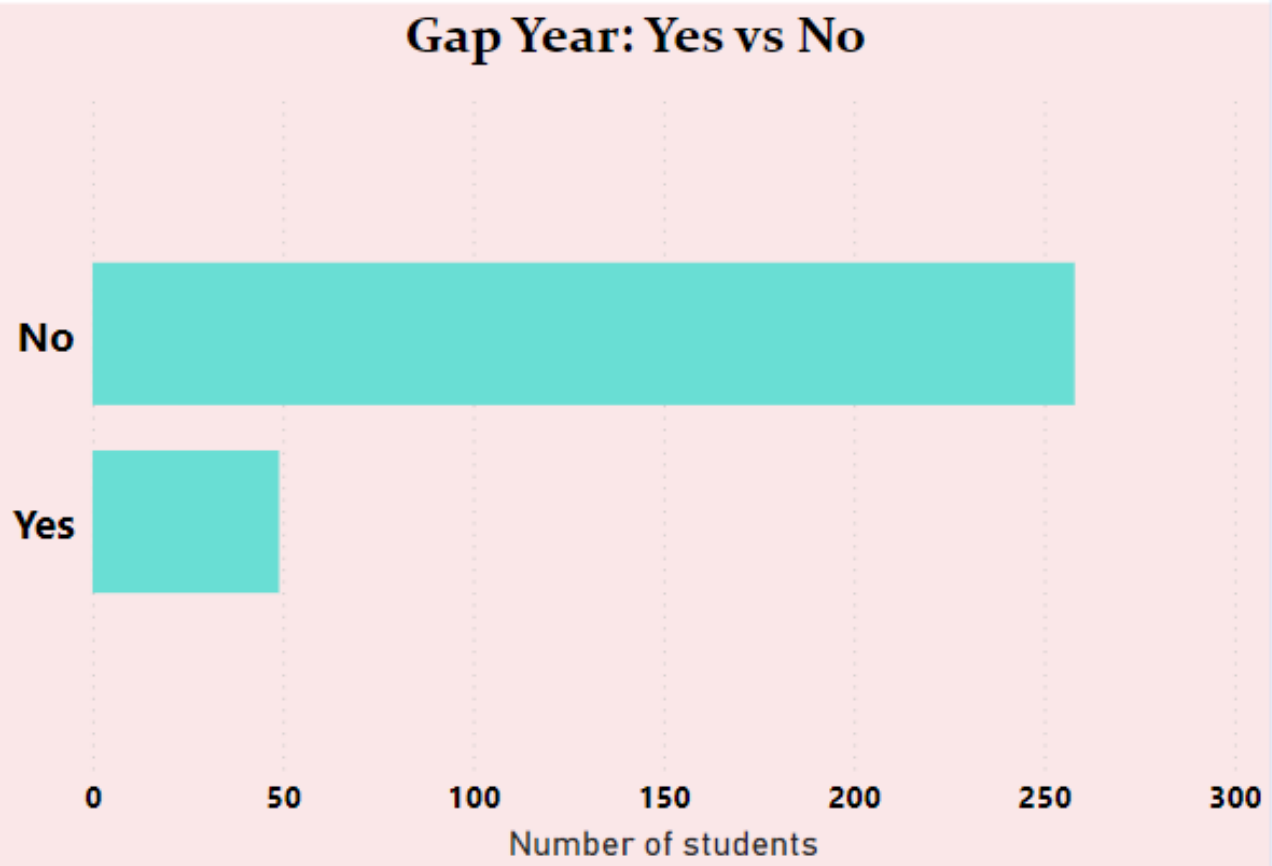


Field of education	No. of Students
Engineering	86
Commerce	69
Science	52
Humanities	39
Medicine	39
Others	22
Total	**307**

Intention of pursuing a career/future in the field

Maybe	No	Yes

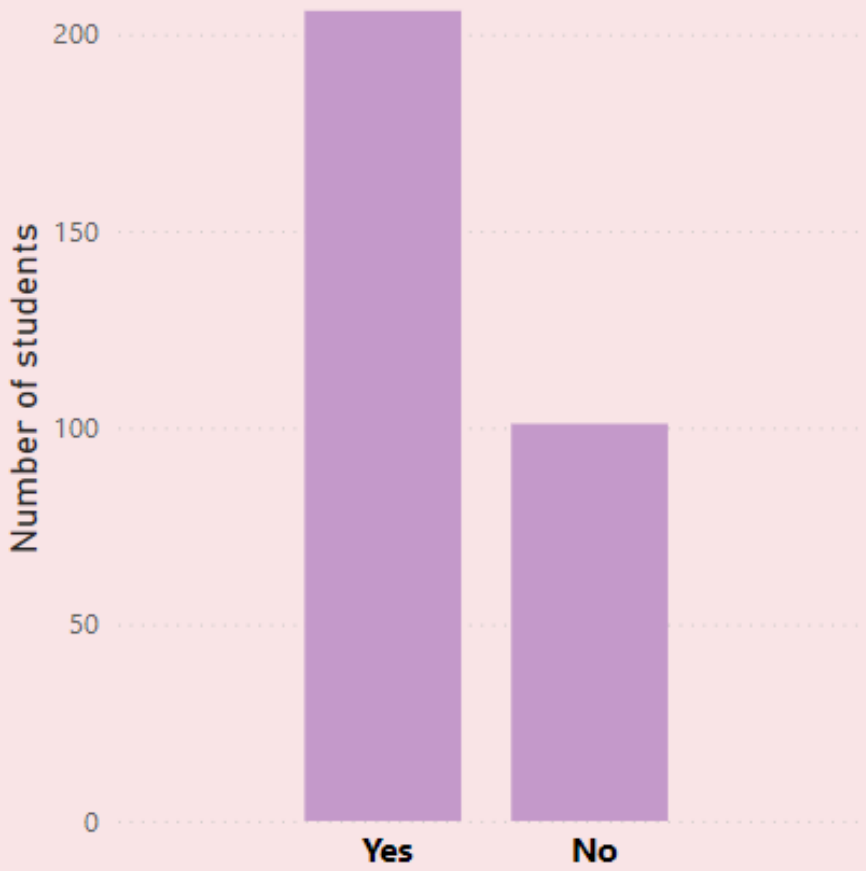
Filters


Gap Year: Yes vs No
No
Yes
0
50
100
150
200
250
300
Number of students

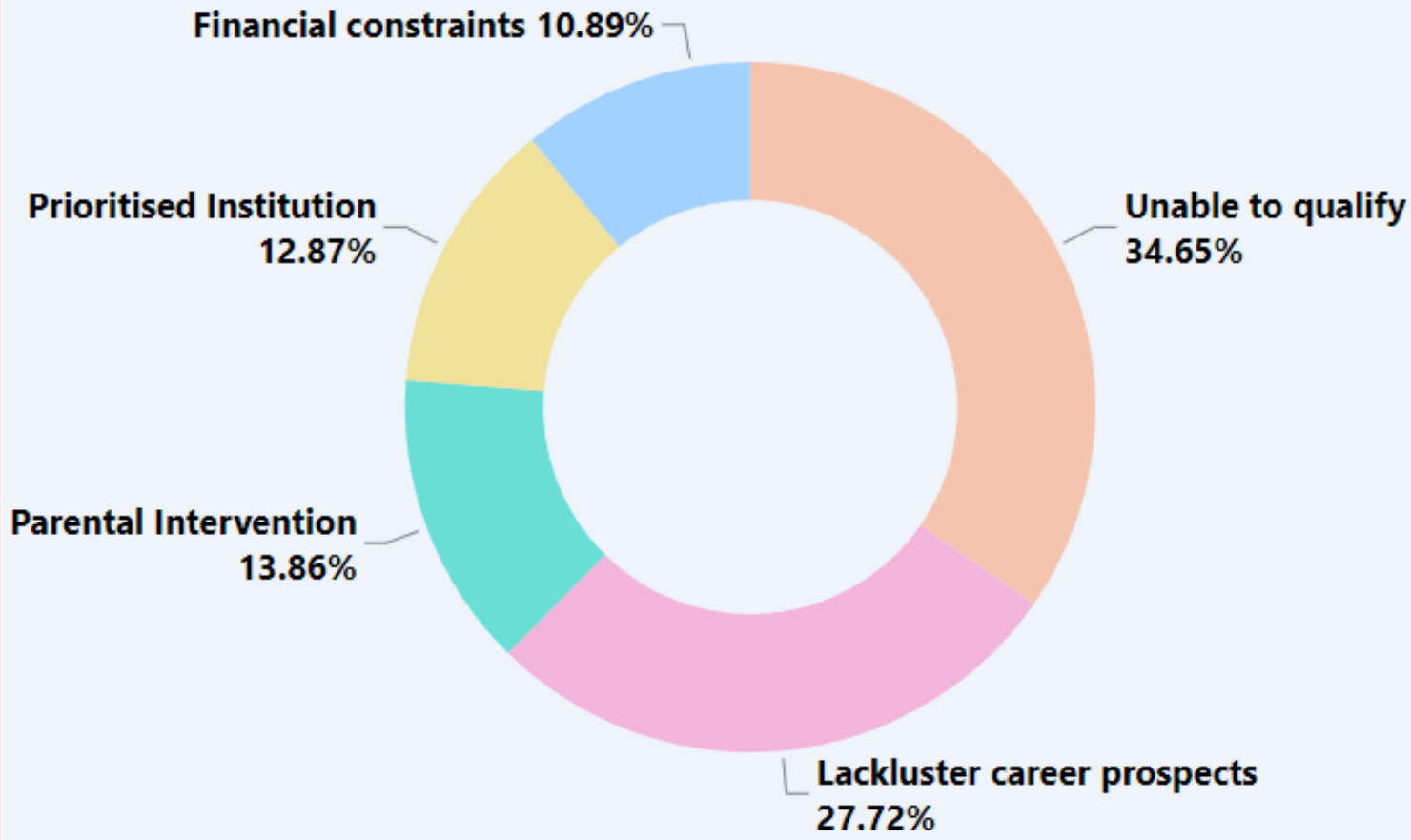
Reasons for taking a drop year
Preparing for competitive exams
Indecisiveness
Didn't get into prefered institute

Filters

First Choice: Yes vs No



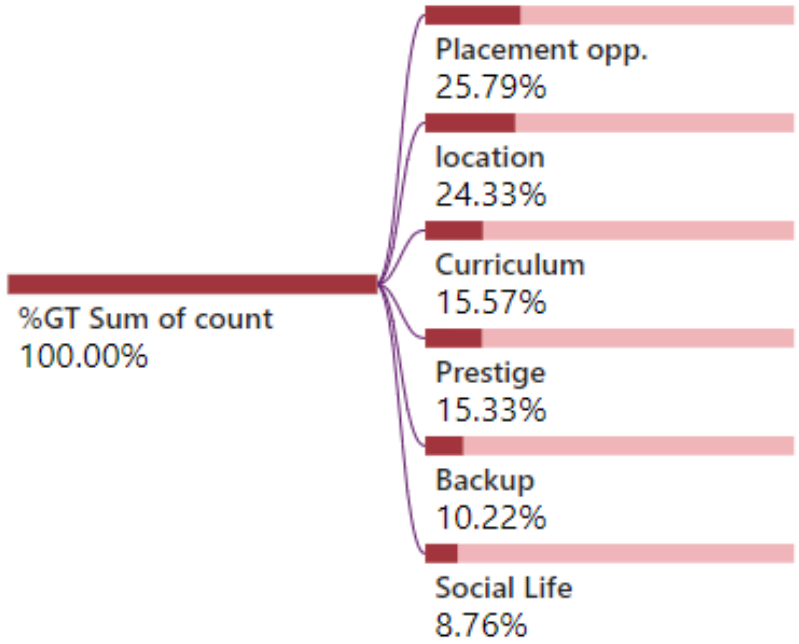
Reasons for choosing the undergrad degree



Filters

Reason for the choice of institute

Why this institute?



Filters

CHI SQUARE TEST FOR INDEPENDENCE OF ATTRIBUTES

Hypothesis

H_0 : A student having second thoughts about their course and if their degree was their first choice are independent events.

v/s

H_1 : A student having second thoughts about their course and if their degree was their first choice are not independent events.

Contingency table:

		Second Thoughts	
		YES	No
First Choice	YES	48	158
	NO	60	41

Test Statistic:

$$X^2 = \frac{\sum_i^N \sum_j^N (O_{ij} - E_{ij})^2}{E_{ij}} \sim X^2_{(m-1)(n-1),\alpha}$$

Where N->Total no. of students(Here, N=307),

m->no. of rows

n->no. of columns

O_{ij}->observed frequency

E_{ij}-> expected frequency

$$E_{ij} = P[A_i B_j] = \frac{A_i * B_j}{N}$$

		Second Thoughts(B)		
		YES	No	
First Choice(A)	YES	48	158	A_1=206
	NO	60	41	A_2=101
		B_1=108	B_2=199	N=307

Expected values

	Second thoughts	No second thoughts	
First Choice	72	134	206
Not first choice	36	65	101
	108	199	307

Decision Rule:

We accept H_0 when $X^2_{cal} < X^2_{(m-1)(n-1),\alpha}$

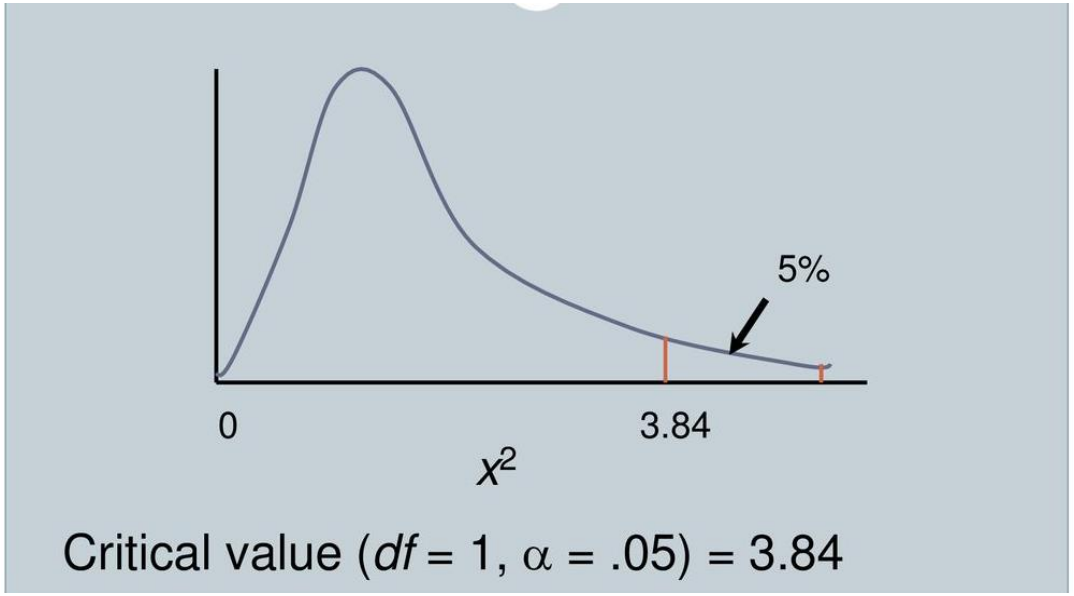
and reject H_0 when $X^2_{cal} > X^2_{(m-1)(n-1),\alpha}$

where,

$$X^2_{(m-1)(n-1),\alpha} = X^2_{(1,\ 0.05)} = 3.841$$

Computed chi square value:

$X^2_{cal} = 38.7422$



Conclusion:

At α=5%, $X^2_{cal} > X^2_{(1, 0.05)}$.

Hence, we reject H_0 and conclude that a students' course being their first choice and them having second thoughts about the course are dependent attributes.

Hypothesis

H_0 : Students' gender and parents' involvement are independent of each other

v/s

H_1 : Students' gender and parents' involvement are not independent of each other

Contingency table:

		INVOLVEMENT OF PARENTS	
		YES	No
Gender	Female	137	25
	Male	105	40

Test Statistic:

$$X^2 = \frac{\sum_i^N \sum_j^N (O_{ij} - E_{ij})^2}{E_{ij}} \sim X^2_{(m-1)(n-1),\alpha}$$

Where N->Total no. of students(Here, N=307),

m->no. of rows

n->no. of columns

O_{ij}->observed frequency

E_{ij}-> expected frequency

$$E_{ij} = P[A_i B_j] = \frac{A_i * B_j}{N}$$

		INVOLVEMENT OF PARENTS(B)		
		YES	No	
Gender(A)	Female	137	25	A_1=162
	Male	105	40	A_2=145
		B_1=242	B_2=65	N=307

Expected values

	Parents involved	Not involved	Total
Female	128	34	162
Male	114	31	145
Total	242	65	307

Decision Rule:

We accept H_0 when $X^2_{cal} < X^2_{(m-1)(n-1),\alpha}$

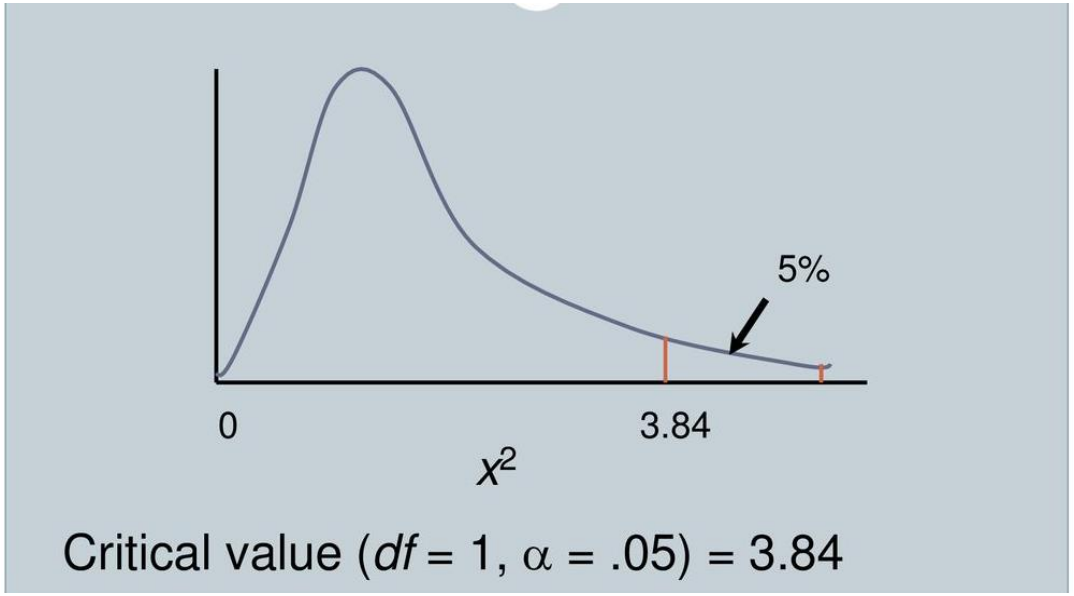
and reject H_0 when $X^2_{cal} > X^2_{(m-1)(n-1),\alpha}$

where,

$$X^2_{(m-1)(n-1),\alpha} = X^2_{(1,\ 0.05)} = 3.841$$

Computed chi square value:

$X^2_{cal} = 6.7723$



Conclusion:

At α=5%, $X^2_{cal} > X^2_{(1, 0.05)}$.

Hence, we reject H_0 and conclude that a students' Parents involvement is dependent on the students' gender.

TEST FOR MULTIPLE PROPORTIONS

Assumptions:

- Sample Size – 307
- No. of males in the sample: n1 = 145
- No. of females in the sample: n2 = 162
- No. of males students who choose the subject due to personal interest – 54 [X1]
- Proportion of male who choose the subject due to personal interest:
- P1 = a1/n1 = 54/145 = 0.37
- No. of female students who choose the subject due to personal interest – 58 [X2]
- Proportion of female who choose the subject due to personal interest:
- P2 = a2/n2 = 58/162 = 0.33
- Q1 = 1-P1 = 0.63 Q2 = 1-P2 = 0.66

- So,
- X1 ~B(n1,P1) X2 ~B(n2,P2)
- For large values of n,
- X1 ~N($\mu 1$, $\sigma 1^2$) X2 ~N($\mu 2$, $\sigma 2^2$)
- $\mu 1 = n1p1 = 145(0.37) = 54$ $\sigma 1^2 = n1p1q1 = 34.02$
- $\mu 2 = n2p2 = 58$ $\sigma 2^2 = n2p2q2 = 38.28$

Hypothesis:

H0: P1 = P2

i.e, Proportions of male student who choose the field of education due to personal interest is equal to the proportion of female student who choose the field of education due to personal interest

H1: P1 ≠ P2

i.e, Proportions of male student who choose the field of education due to personal interest is not equal to the proportion of female student who choose the field of education due to personal interest.

Test Statistic:

Under H0, the test statistic is given by,

$$z = \frac{\hat{p}_1 - \hat{p}_2}{\sqrt{\frac{\hat{p}_1(1-\hat{p}_1)}{n_1} + \frac{\hat{p}_2(1-\hat{p}_2)}{n_2}}} \quad \sim N(0,1)$$

Statistical Computation:

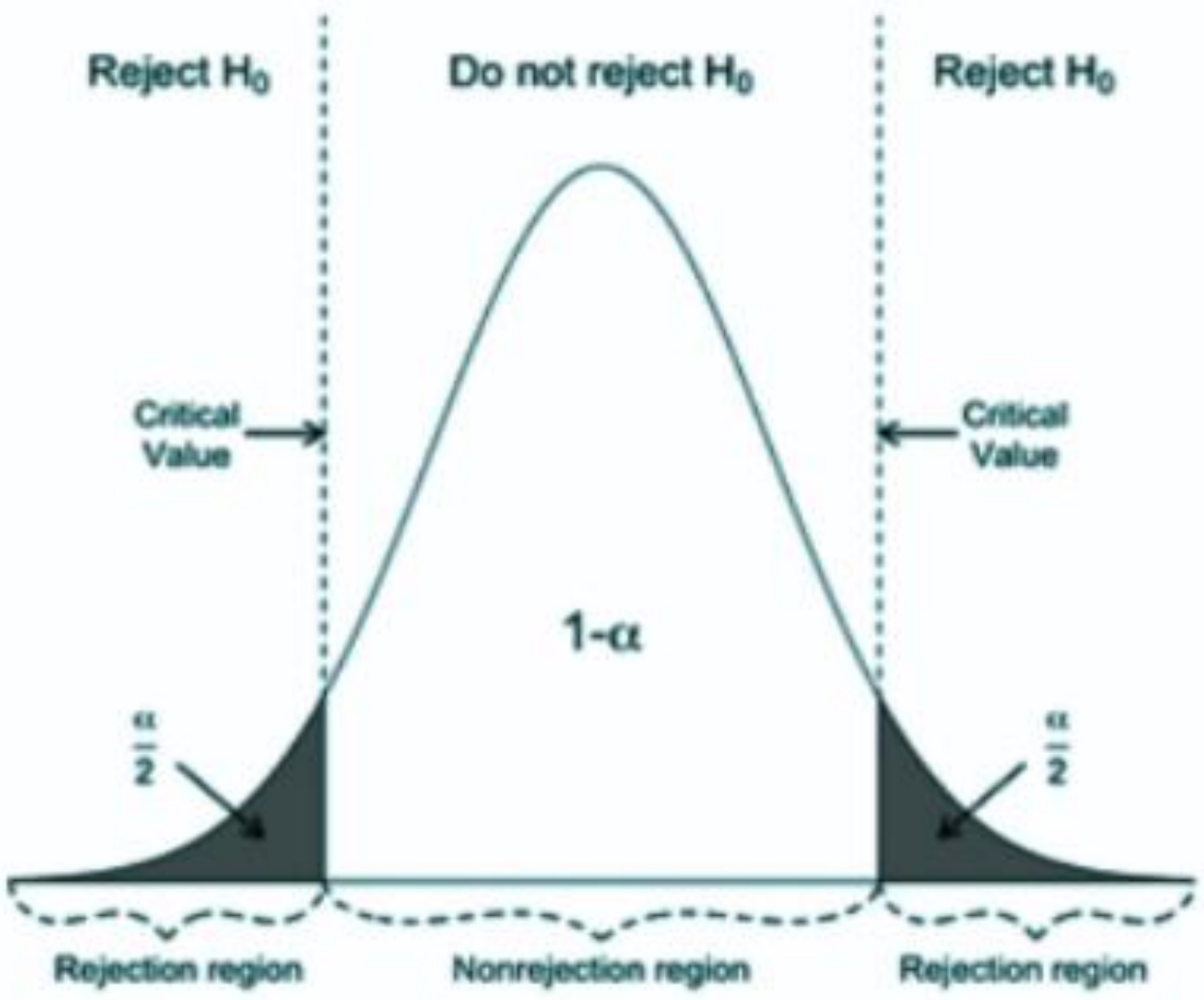
```
> Gender <-matrix(c(58,104,54,91),ncol=2,byrow=TRUE)
> rownames(Gender) <-c("Female","Male")
> colnames(Gender) <-c("PI","NPI")
> Gender=as.table(Gender)
> Gender
        PI NPI
Female  58 104
Male    54  91
> barplot(Gender,beside=TRUE)
> prop.test(Gender)

        2-sample test for equality of proportions with
        continuity correction

data:  Gender
X-squared = 0.02037, df = 1, p-value = 0.8865
alternative hypothesis: two.sided
95 percent confidence interval:
 -0.1288226  0.1000444
sample estimates:
   prop 1    prop 2
0.3580247 0.3724138
```

Decision Rule:

At α = 5% level of significance, since P1 = P2, the test is two sided.
The test statistic value is
Z = 0.1427235
P Value = 0.8865



Conclusion:

For $\alpha = 5\%$ level of significance, p value $> \alpha$.
So, we accept H0, and conclude that the proportion of male student who choose the field of education due to personal interest is equal to the proportion of female student who choose the field of education due to personal interest.

LIMITATIONS

- The sample which we have collected is only from the city of Bangalore, so the data might be an inaccurate representation our country's population.
- Reliance on self-reported data might introduce bias, as respondents may not always accurately recall or report their experiences.
- As personal interest and feelings are subjective, respondents might find it challenging to express their motivation accurately

CONCLUSION

- To understand what factors- Personal interest, Parents' influence, Career Prospects, Course Content, Institute, and Recommendations from teachers/friends, play an important role when students choose their Undergraduate course.
- To find if the chosen subject aligns with their future career or educational goals.
- To find out if career counselling had an impact on the student’s choice.
- To find out whether students are content with their choice or have any second thoughts and the reasons for the latter.
- To find out if the students took a gap year and the possible reasons for the decision.
- To understand what attracts a student to enrol into an institution and how involved the parents were throughout the entire process (from choice of course to admission into an institute).

FUTURE USES

Our study reveals significant patterns, institutions and policy makers could use this information to tailor educational policies.

It contributes to the development of more effective career counselling programs, aiding students in making informed decisions.

Educational institutions may use our findings to improve course offerings, communication strategies, and support services for students.

Future researchers could build upon our work by conducting studies to track changes in students' choice and experiences over time.

Comparing findings across different regions or cultural contexts could provide a more comprehensive understanding of the factors influencing undergraduate course choices.

Recommendations based on our research could be used to enhance the involvement of parents in the decision-making process, fostering better communication between parents and students.