Survey on Mental Health Across Programs of Study in University

Mental Health Maniacs - Deanna King, Jim Moroney, Pooja Patel, Christopher Wilhite

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Packages

In order to better interpret the dataset, we utilize the `pander` package for table creation and manipulation.

```
library(pander)
```

1. Student Mental Health Data

All data required for this interpretation was obtained from the International Islamic University in Malaysia. This dataset is publicly available via Kaggle, and contains the following features:

- `Timestamp` - time at which the survey was completed
- `Choose your gender` - gender (male or female) of the participant
- `Age` - age of the participant at the time of survey completion
- `What is your course?` - program in which the participant is majoring
- `Your current year of Study` - how many years the participant has attended university
- `What is your CGPA?` - current grade point average (or the ratio of grade points earned to grade points attempted), calculated on a 0.0-4.0 scale
- `Marital Status` - describes whether or not the participant is married
- `Do you have Depression?` - states whether or not the participant has depression
- `Do you have Anxiety?` - states whether or not the participant has anxiety
- `Do you have Panic attacks?` - states whether or not the participant experiences panic attacks
- `Did you seek any specialist for a treatment?` - states whether or not the participant sought professional treatment for any mental health concerns

```
studentData_df <- read.csv(file="./StudentMentalHealth.csv")
#str(studentData_df)
summary(studentData_df)
```

```
##   Timestamp         Choose.your.gender      Age        What.is.your.course.
##  Length:101         Length:101         Min.   :18.00   Length:101
##  Class :character   Class :character   1st Qu.:18.00   Class :character
##  Mode  :character   Mode  :character   Median :19.00   Mode  :character
##                                        Mean   :20.53
##                                        3rd Qu.:23.00
##                                        Max.   :24.00
##                                        NA's   :1
##  Your.current.year.of.Study What.is.your.CGPA. Marital.status
##  Length:101                 Length:101         Length:101
##  Class :character           Class :character   Class :character
##  Mode  :character           Mode  :character   Mode  :character
##
##
##
```

```
##
##  Do.you.have.Depression. Do.you.have.Anxiety. Do.you.have.Panic.attack.
##  Length:101              Length:101           Length:101
##  Class :character        Class :character     Class :character
##  Mode  :character        Mode  :character     Mode  :character
##
##
##
##
##  Did.you.seek.any.specialist.for.a.treatment.
##  Length:101
##  Class :character
##  Mode  :character
##
##
##
##
```

```
#pander(studentData_df)
```

2. Data Cleaning

We thoroughly examined the data to ensure that no noisy or missing data values were present. More specifically, we ensured that no negative values existed in our numerical attributes (age, year of study, CGPA), and that no missing values were present in any tuple. Upon examination, only one column was found to have any missing data: `Age`. Though it is not particularly robust, we opted to fill in this missing data with the mean of the column.

```
studentData_df$Age[is.na(studentData_df$Age)] <- floor(mean(studentData_df$Age, na.rm=TRUE))
```

In order to further facilitate our analysis of this data, we deemed it appropriate to drop the `Timestamp` column, as it provided no relevant information. It seemed to be more of a vanity metric for the circumstances in which the data was originally acquired.

```
studentData_df = subset(studentData_df, select = -c(1))
summary(studentData_df)
```

```
##  Choose.your.gender      Age        What.is.your.course.
##  Length:101         Min.   :18.00   Length:101
##  Class :character   1st Qu.:18.00   Class :character
##  Mode  :character   Median :19.00   Mode  :character
##                     Mean   :20.52
##                     3rd Qu.:23.00
##                     Max.   :24.00
##  Your.current.year.of.Study What.is.your.CGPA. Marital.status
##  Length:101                 Length:101         Length:101
##  Class :character           Class :character   Class :character
##  Mode  :character           Mode  :character   Mode  :character
##
##
##
##  Do.you.have.Depression. Do.you.have.Anxiety. Do.you.have.Panic.attack.
##  Length:101              Length:101           Length:101
##  Class :character        Class :character     Class :character
##  Mode  :character        Mode  :character     Mode  :character
##
```

```
##
##
##  Did.you.seek.any.specialist.for.a.treatment.
##  Length:101
##  Class :character
##  Mode  :character
##
##
##
```

Due to the method in which this survey was conducted, some features of the data were able to be entered in an non-deterministic manner. The column `Your.current.year.of.Study` exhibits this the most, as random capitalization in the responses creates several different "bins" of responses for data that is otherwise meant to be the same. To fix this, we elected to simple cast all characters in this column to an uppercase state to remove any ambiguity.

```
studentData_df$Your.current.year.of.Study <- toupper(studentData_df$Your.current.year.of.Study)
```

3. Data Wrangling

3.1. Renaming Columns

For both exploratory analysis and display purposes, data wrangling consisted of making the data look more presentable and easier to parse. Through some minor idiosyncrasies of the method through which this data was obtained, lengthy and oddly formatted names currently index most of our columns. To resolve this, we gave each column a less-verbose name that still unambiguously indicates what data said column held.

- `Choose.your.gender` becomes simply `Gender`
- `Age` - satisfies our requirements already.
- `What.is.your.course.` - is simplified into `Major`
- `Your.current.year.of.Study` - is shortened to `Year`
- `What.is.your.CGPA.` - is shortened to `GPA`

The following attributes have been shortened to just their respective affects. It is assumed that the names are preceded by either "is" or "has" before each condition (i.e. "has Anxiety).

- `Marital.status` becomes `Married`
- `Do.you.have.Depression.` becomes `Depressed`
- `Do.you.have.Anxiety.` becomes `Anxiety`
- `Do.you.have.Panic.attack.` becomes `Panic`
- `Did.you.seek.any.specialist.for.a.treatment.` becomes `Treatment`

With all of these, we were seeking the simplicity of single word names.

```
colnames(studentData_df)[colnames(studentData_df) ==
                           'Choose.your.gender'] <- 'Gender'
colnames(studentData_df)[colnames(studentData_df) ==
                           'What.is.your.course.'] <- 'Major'
colnames(studentData_df)[colnames(studentData_df) ==
                           'Your.current.year.of.Study'] <- 'Year'
colnames(studentData_df)[colnames(studentData_df) ==
                           'What.is.your.CGPA.'] <- 'GPA'
colnames(studentData_df)[colnames(studentData_df) ==
                           'Marital.status'] <- 'Married'
colnames(studentData_df)[colnames(studentData_df) ==
                           'Do.you.have.Depression.'] <- 'Depressed'
colnames(studentData_df)[colnames(studentData_df) ==
                           'Do.you.have.Anxiety.'] <- 'Anxiety'
```

```
colnames(studentData_df)[colnames(studentData_df) ==
                           'Do.you.have.Panic.attack.'] <- 'Panic'
colnames(studentData_df)[colnames(studentData_df) ==
                           'Did.you.seek.any.specialist.for.a.treatment.'] <- 'Treatment'
```

3.2. Categorizing Ambiguous Data

Given that we are looking for various correlations between Science, Technology, Engineering, and Mathematics (STEM) majors, and the various mental health issues that might affect them, the detailed knowledge of what major a student is enrolled in doesn't interest us as data - we only care whether or not it's considered STEM. Unfortunately, there is no easy algorithmic way to do this; we had considered using various "sounds-like" libraries and methods, but decided for a dataset this small that it would be best to just manually build a new column by hand. This included looking for what the responses from the `Major` column in our dataset correlated to and simply populating a new column with "Yes" or "No" before adding it to our dataset. We added this column as `STEM`. We have included the first 5 rows as a sample of the data set, and the full data set is listed in Appendix A at the end of this document.

```
studentData_df['STEM'] <- c('Yes','No','Yes','No','Yes','Yes','No','Yes','No','No',
                            'Yes','Yes','Yes','Yes','No','Yes','No','No','Yes','Yes',
                            'Yes','Yes','Yes','Yes','Yes','No','Yes','Yes','Yes','Yes',
                            'No','Yes','Yes','Yes','Yes','Yes','No','Yes','No','Yes',
                            'Yes','Yes','No','Yes','No','Yes','Yes','Yes','Yes','Yes',
                            'No','Yes','Yes','Yes','Yes','Yes','No','No','Yes','No',
                            'Yes','Yes','Yes','Yes','Yes','No','Yes','No','No','Yes',
                            'Yes','No','Yes','Yes','Yes','Yes','Yes','No','Yes','Yes',
                            'No','No','Yes','No','Yes','Yes','No','Yes','Yes','Yes',
                            'No','Yes','Yes','No','No','No','Yes','Yes','No','No',
                            'Yes')
pander(studentData_df[1:5,])
```

Table 1: Table continues below

Gender	Age	Major	Year	GPA	Married	Depressed
Female	18	Engineering	YEAR 1	3.00 - 3.49	No	Yes
Male	21	Islamic education	YEAR 2	3.00 - 3.49	No	No
Male	19	BIT	YEAR 1	3.00 - 3.49	No	Yes
Female	22	Laws	YEAR 3	3.00 - 3.49	Yes	Yes
Male	23	Mathemathics	YEAR 4	3.00 - 3.49	No	No

Anxiety	Panic	Treatment	STEM
No	Yes	No	Yes
Yes	No	No	No
Yes	Yes	No	Yes
No	No	No	No
No	No	No	Yes

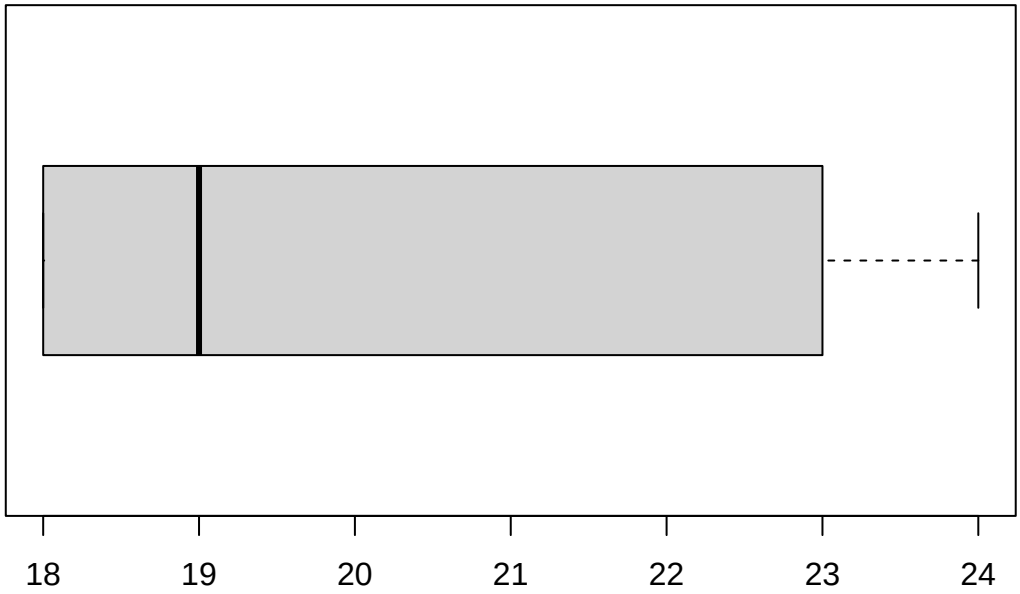
4. Exploratory Data Analysis

4.1 Age Distribution

The following boxplot shows the distribution of each participant's age. The youngest participants are 18 years old, and the oldest are 24 years old. Given that our mean is 20.52, we can be assured that our data is

fairly representative of the average college student.

```
boxplot(studentData_df$Age, horizontal = TRUE)
```



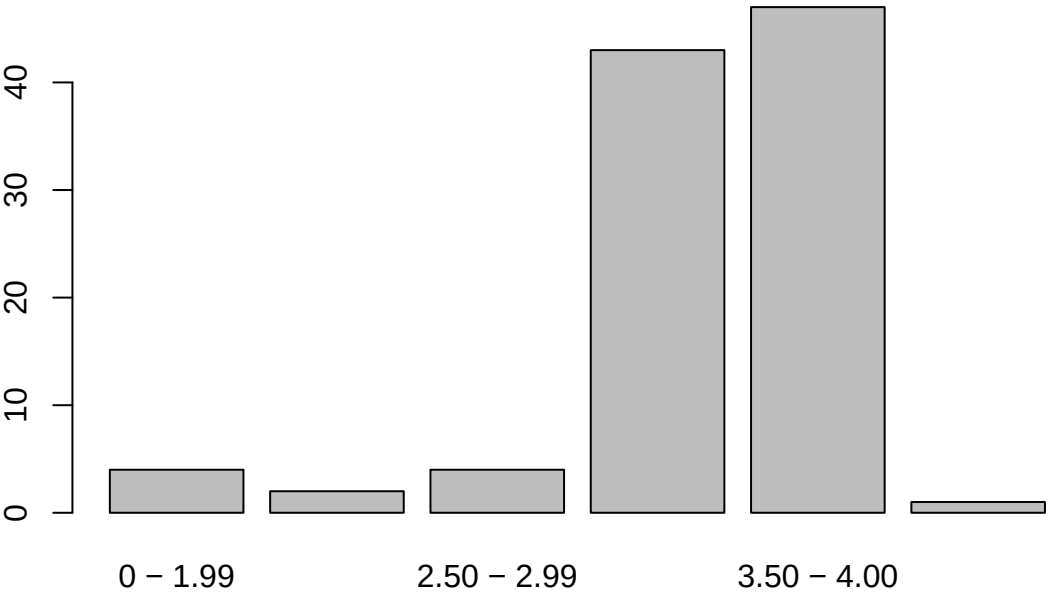

```
summary(studentData_df$Age)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   18.00   18.00   19.00   20.52   23.00   24.00
```

4.2 CGPA Distribution

The following histogram shows the frequency of each CGPA interval for participants. Most participants have a CGPA within the range of 3.00 - 3.49.

```
gpaTable <- table(studentData_df$GPA)
barplot(gpaTable)
```



4.3 Analysis of Key Data Characteristics

4.3.1 Distribution of Gender and Major

Below we can see two key aspects of our data set displayed in a contingency table. Represented in the rows is the distribution of male and female students, with the columns showing how many of each are majoring in a STEM field or not. With the "Sum" features of this table, we can see that nearly 75 percent of our student sample is female, with just over two thirds of all students majoring in some STEM field. This could indicate that we are not accurately representing both males and females with this data, and this will be kept in mind moving forward.

```
genderSTEMtable <- addmargins(with(studentData_df,
                                   table(studentData_df$Gender, studentData_df$STEM)))
pander(genderSTEMtable, style = "grid", caption = "STEM Majors by Gender")
```

Table 3: STEM Majors by Gender

	No	Yes	Sum
Female	28	47	75
Male	5	21	26
Sum	33	68	101

The data we're working with indicates that 62.67% of all female students are in STEM, while 80.77% of all male students represented are majoring in some STEM field.

4.3.2 Mental Health by Gender and Major

Given that our data is so heavily skewed in samples toward females, we decided to analyze how self-reported depression stacks up by both gender and major. Below is a contingency table that represents gender by row, and whether or not the student reported as depressed by column.

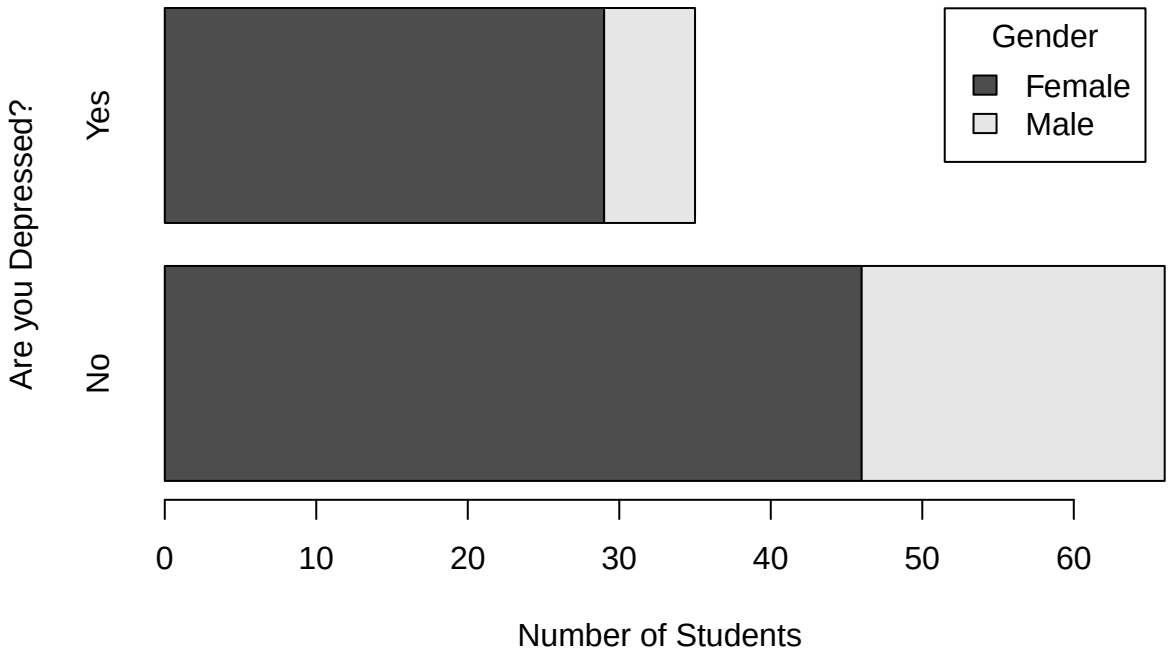
```
genderDepressedtable <- addmargins(with(studentData_df, table(studentData_df$Gender,
                                                              studentData_df$Depressed)))
pander(genderDepressedtable, style = "grid", caption = "Depressed Students by Gender")
```

Table 4: Depressed Students by Gender

	No	Yes	Sum
Female	46	29	75
Male	20	6	26
Sum	66	35	101

The data we're working with indicates that 38.67% of all female students reported as depressed, while 23.08% of all male students indicated in the survey that they are depressed. This data is graphically represented in a bar chart below.

```
barplot (with(studentData_df, table(studentData_df$Gender, studentData_df$Depressed)),
         horiz=TRUE, xlab = "Number of Students", ylab = "Are you Depressed?",
         legend.text = TRUE, args.legend = list(title = "Gender"))
```



Perhaps a more relevant exploration of this data, especially for the purposes of this survey, would be the relationship between being a STEM major and reporting as Depressed. Our table below once again represents whether a student is depressed or not by column, but this time the rows give us the quality of being in a STEM related major.

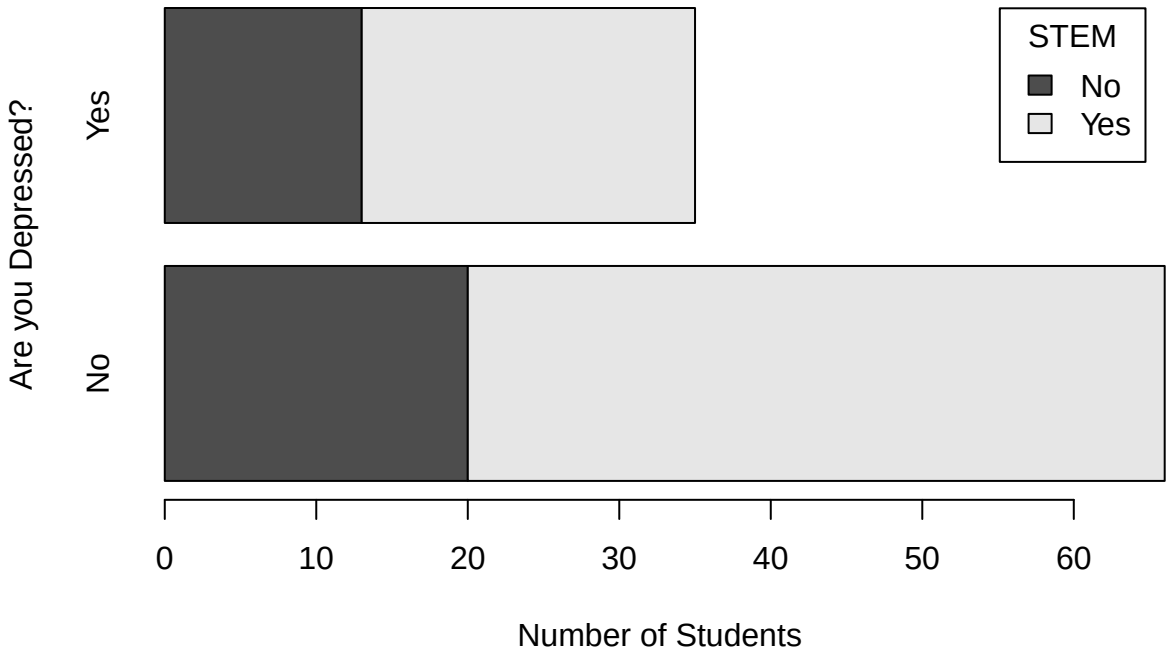
```
stemDepressedtableNM <- with(studentData_df, table(studentData_df$STEM,
                                                   studentData_df$Depressed))
stemDepressedtable <- addmargins(stemDepressedtableNM) # NM = No margins
pander(stemDepressedtable, style = "grid", caption = "Depressed Students by Major")
```

Table 5: Depressed Students by Major

	No	Yes	Sum
No	20	13	33
Yes	46	22	68
Sum	66	35	101

Of all students surveyed, we can ascertain that 34.65% of them report having depression. In finer granularity, depression among STEM majors is at 32.35%, and 39.39% in non-STEM majors.

```
barplot (with(studentData_df, table(studentData_df$STEM,
                                    studentData_df$Depressed)),
         horiz=TRUE, xlab = "Number of Students", ylab = "Are you Depressed?",
         legend.text = TRUE, args.legend = list(title = "STEM"))
```



We can also look at mental health affects outside of depression. For instance, this table gives us STEM major by row and whether a student reported having anxiety attacks or not by column.

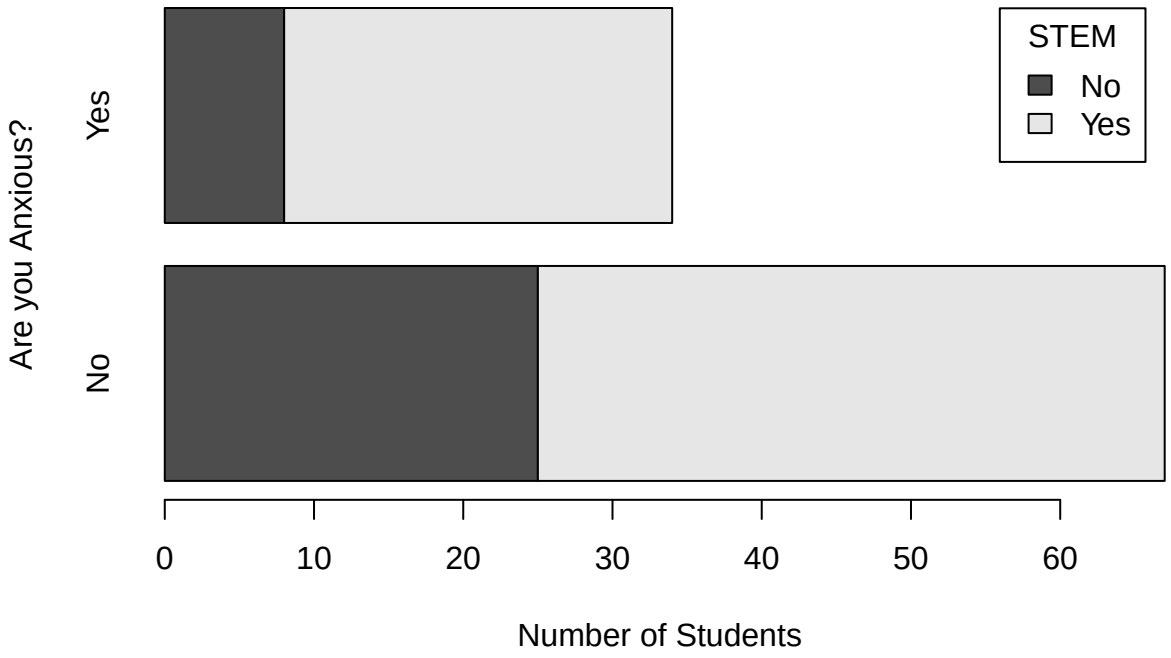
```
stemAnxioustableNM <- with(studentData_df, table(studentData_df$STEM,
                                                 studentData_df$Anxiety))
stemAnxioustable <- addmargins(stemAnxioustableNM)
pander(stemAnxioustable, style = "grid", caption = "Anxious Students by Major")
```

Table 6: Anxious Students by Major

	No	Yes	Sum
No	25	8	33
Yes	42	26	68
Sum	67	34	101

Anxiety is less prevalent among the students who were polled for this data set, but only just at 33.66% Though anxiety among STEM majors is significantly higher at 38.24%, and much lower at 24.24% in non-STEM majors.

```
barplot (with(studentData_df, table(studentData_df$STEM,
                                    studentData_df$Anxiety)),
         horiz=TRUE, xlab = "Number of Students", ylab = "Are you Anxious?",
         legend.text = TRUE, args.legend = list(title = "STEM"))
```



In all of these fields, the bar plots serve to give a sense of scale in the sampled populations, and gives a rough idea of what ratio one could expect from a given sample analysis.

4.3.4 Relating GPA to Depression

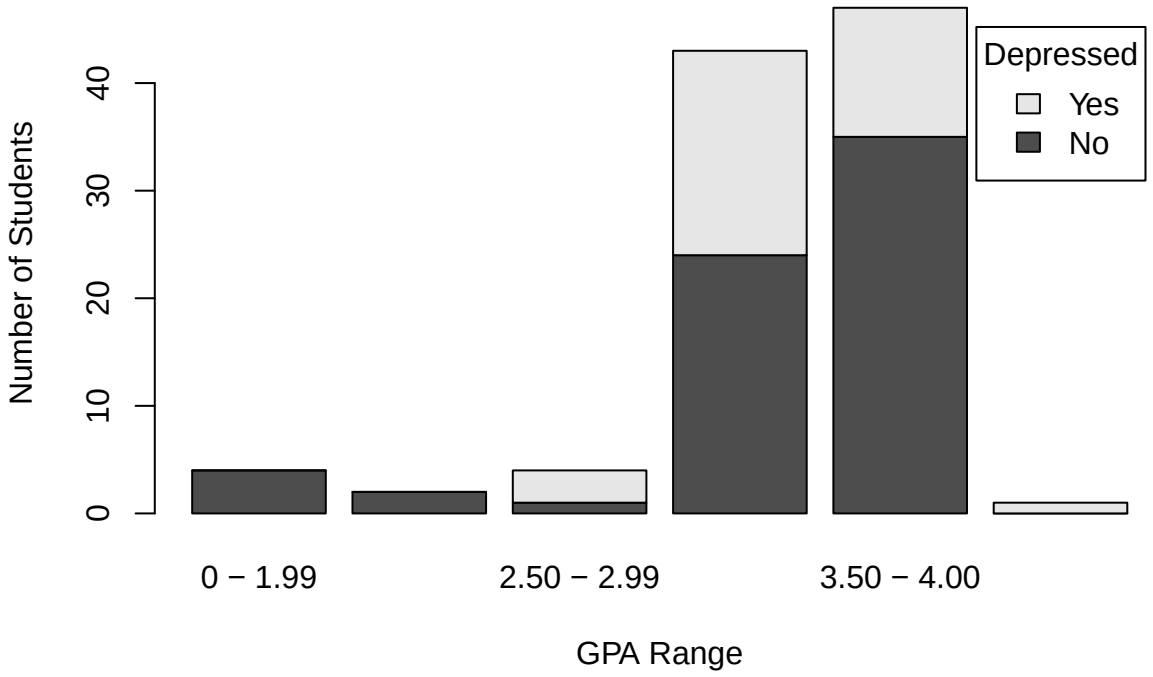
The rows of the following table contain several ranges of GPA that represents the sample, and the columns once again show whether or not a student is depressed.

```
gpaDepressiontable <- with(studentData_df, table(studentData_df$GPA,
                                                 studentData_df$Depressed))
gpaDepTotals <- addmargins(gpaDepressiontable)
pander(gpaDepTotals, style = "grid", caption = "Depressed Students by GPA")
```

Table 7: Depressed Students by GPA

	No	Yes	Sum
0 - 1.99	4	0	4
2.00 - 2.49	2	0	2
2.50 - 2.99	1	3	4
3.00 - 3.49	24	19	43
3.50 - 4.00	35	12	47
3.50 - 4.00	0	1	1
Sum	66	35	101

```
barplot (t(gpaDepressiontable),
         horiz=FALSE, ylab = "Number of Students", xlab = "GPA Range",
         legend.text = TRUE, args.legend = list(title = "Depressed"))
```



4.3.5 Progression in College and Panic Attacks

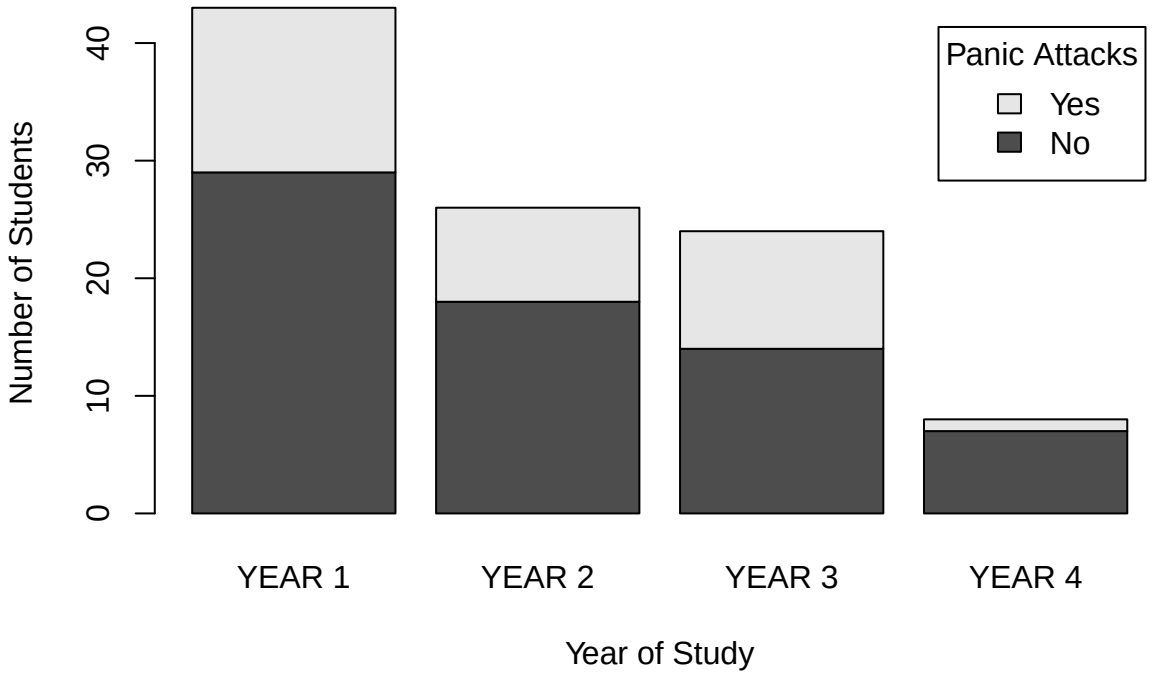
To determine if a relationship exists between the features `Year` and `Panic`, we analyzed the following materials:

```
yearPanictable <- with(studentData_df, table(studentData_df$Year,
                                             studentData_df$Panic), keepAttrs = TRUE)
yrPanTotals <- addmargins(yearPanictable)
pander(yrPanTotals, style = "grid", caption = "Panic in Students by Year")
```

Table 8: Panic in Students by Year

	No	Yes	Sum
YEAR 1	29	14	43
YEAR 2	18	8	26
YEAR 3	14	10	24
YEAR 4	7	1	8
Sum	68	33	101

```
barplot (t(yearPanictable),
         horiz=FALSE, ylab = "Number of Students", xlab = "Year of Study",
         legend.text = TRUE, args.legend = list(title = "Panic Attacks"))
```



5. Drawing Conclusions from this Data

Due to the relative simplicity of our data, drawing meaningful interpretations from it can be achieved with relatively simple statistical methods. Principally, we'd like to see if there's any correlation with these various afflictions and being in STEM. More importantly we'd like to be able to say with any degree of confidence how likely an individual is to be afflicted any given mental illness given the quality of their features.

To achieve this we need to set up a series of tests, the dichotomous and categorical nature of our data suggests that methods like correlation matrices would not provide adequate insight. However, performing basic statistical analysis - such as checking for conditional probability and basing hypotheses off of the independence of the variables involved in said conditional probability - could prove to be valuable in determining the relationships we're looking for between variables.

5.1 A Relation Between STEM and Depression

From our `stemDepressedTable` in section `4.3.2` we can start to build probabilities. In this case, we're interested in the probability of being depressed given that an individual is a STEM major. We can express this as:

$$P(Depressed|STEM) = \frac{P(Depressed \cap STEM)}{P(STEM)}$$

Moreover, we're interested if this probability is greater alone than the probability of being depressed across all majors, given out previous definition we can express this idea as:

$$P(Depressed|STEM) > P(Depressed)$$

But before we can step into calculations for this we need to determine whether or not these events are independent, we can also form our test hypothesis from this. If we postulate that that being a STEM major has an affect on depression in students, we would infer that these two variables are dependent, if they have no affect on one another we consider them independent. With this in mind we can state our null hypothesis, H_0, as our variables being independent, and our alternative hypothesis, H_A, will state that our variables are indeed dependent. As our variables in this case are categorical - the chi-square test will be our best option

for determining this. Stated in a more succinct manner as:

H_0: *The probability of being depressed is not dependent on being a STEM major.*

H_A: *The probability of being depressed is dependent on being a STEM major.*

The following code simply executes the chi-square test on the `stemDepressedTable` table.

```
stemDepressedtableNM
```

```
##
##       No Yes
##   No  20  13
##   Yes 46  22
```

```
stemDepCHSQ <- chisq.test(stemDepressedtableNM, correct = TRUE)
stemDepCHSQ
```

```
##
##  Pearson's Chi-squared test with Yates' continuity correction
##
## data:  stemDepressedtableNM
## X-squared = 0.22517, df = 1, p-value = 0.6351
```

Given that a Type II error would be more detrimental to our study, we opt to chose a relatively high significance level of .1 when making our decision. With a p-value of 0.6351313, we actually do not satisfy the $p < 0.1$ significance to reject our null hypothesis, and thus can conclude these events are independent.

Knowing that, we can doubly enforce this by running a few simple calculations to determine *P(Depressed | STEM)*, we'll store these to make calculation easier in the future.

```
p_Depressed <- (stemDepressedtable[3,2]/stemDepressedtable[3,3])
p_STEM <- (stemDepressedtable[2,3]/stemDepressedtable[3,3])

p_depGstem <- (p_Depressed * p_STEM)/p_STEM
```

Given that *P(Depressed)* equals 0.3465347 and *P(Depressed | STEM)* equals 0.3465347, this does not fulfill our desired result of *P(Depressed | STEM) > P(Depressed)*, and further supports our rejection of the alternative hypothesis.

5.2 Continued Evaluation of Assumptions

Though our team set out evaluate principally how STEM majors are affected by depression, we can use similar methods to test other hypothesis in the same vein. Similar to our last section we can build methods to evaluate other mental illnesses and their propensity to appear in STEM majors, in this case we'll take a look at Anxiety using `stemAnxiousTable` - also from `4.3.2`.

Once again we're investigating to see if there's any affect on the probability of a student having anxiety based on their enrollment in STEM curricula. We can express this as:

$$P(Anxious|STEM) = \frac{P(Anxious \cap STEM)}{P(STEM)}$$

And the meat n' taters portion of it:

$$P(Anxious|STEM) > P(Anxious)$$

Similarly we must check for independence between anxiety and STEM enrollment, constructing our hypothesis off of this once again:

H_0: *The probability of being Anxious is not dependent on being a STEM major.*

H_A: *The probability of being Anxious is dependent on being a STEM major.*

Now we execute the chi-square test on our data from `stemAnxioustable`.

```
stemAnxioustableNM
```

```
##
##       No Yes
##   No  25   8
##   Yes 42  26
```

```
stemAnxCHSQ <- chisq.test(stemAnxioustable, correct = TRUE)
stemAnxCHSQ
```

```
##
##  Pearson's Chi-squared test
##
## data:  stemAnxioustable
## X-squared = 1.9481, df = 4, p-value = 0.7453
```

Even after once again choosing a robust significance of 0.10, our p value of 0.7453102 fails to meet the p < .10 requirement to reject our null hypothesis. We summarily conclude that the probability of being anxious is not dependent on being a STEM major.

This is reflected as we do our calculations for *P(Anxious | STEM) > P(Anxious)*.

```
p_Anxious <- (stemAnxioustable[3,2]/stemAnxioustable[3,3])
p_STEM <- (stemAnxioustable[2,3]/stemAnxioustable[3,3])

p_anxGstem <- (p_Anxious * p_STEM)/p_STEM
```

Once again our decision is reinforced by *P(Anxious | STEM)* - 0.3366337, and *P(Anxious)* - 0.3366337, not satisfying our original assumption of *P(Anxious | STEM) > P(Anxious)*.

6. Conclusions

6.1 Possible Pitfalls

Appendix A - Data

```
pander(studentData_df, caption = "Mental Health in University Students")
```

Table 9: Mental Health in University Students (continued below)

Gender	Age	Major	Year	GPA	Married
Female	18	Engineering	YEAR 1	3.00 - 3.49	No
Male	21	Islamic education	YEAR 2	3.00 - 3.49	No
Male	19	BIT	YEAR 1	3.00 - 3.49	No
Female	22	Laws	YEAR 3	3.00 - 3.49	Yes

Gender	Age	Major	Year	GPA	Married
Male	23	Mathemathics	YEAR 4	3.00 - 3.49	No
Male	19	Engineering	YEAR 2	3.50 - 4.00	No
Female	23	Pendidikan islam	YEAR 2	3.50 - 4.00	Yes
Female	18	BCS	YEAR 1	3.50 - 4.00	No
Female	19	Human Resources	YEAR 2	2.50 - 2.99	No
Male	18	Irkhs	YEAR 1	3.50 - 4.00	No
Female	20	Psychology	YEAR 1	3.50 - 4.00	No
Female	24	Engineering	YEAR 3	3.50 - 4.00	Yes
Female	18	BCS	YEAR 1	3.00 - 3.49	No
Male	19	Engineering	YEAR 1	3.00 - 3.49	No
Female	18	KENMS	YEAR 2	3.50 - 4.00	No
Male	24	BCS	YEAR 3	3.50 - 4.00	No
Female	24	Accounting	YEAR 3	3.00 - 3.49	No
Female	24	ENM	YEAR 4	3.00 - 3.49	Yes
Female	20	BIT	YEAR 2	3.50 - 4.00	No
Female	18	Marine science	YEAR 2	3.50 - 4.00	Yes
Female	19	Engineering	YEAR 1	3.00 - 3.49	No
Female	18	KOE	YEAR 2	3.00 - 3.49	No
Female	24	BCS	YEAR 1	3.50 - 4.00	No
Female	24	Engineering	YEAR 1	3.00 - 3.49	No
Female	23	BCS	YEAR 3	3.50 - 4.00	No
Female	18	Banking Studies	YEAR 1	3.50 - 4.00	No
Female	19	Engineering	YEAR 1	3.50 - 4.00	No
Male	18	Engineering	YEAR 2	3.00 - 3.49	Yes
Female	24	BIT	YEAR 3	3.50 - 4.00	Yes
Female	24	BCS	YEAR 4	3.50 - 4.00	No
Female	23	Business Administration	YEAR 2	3.00 - 3.49	No
Male	18	BCS	YEAR 2	3.00 - 3.49	No
Male	19	BCS	YEAR 1	3.50 - 4.00	No
Male	18	BCS	YEAR 2	3.50 - 4.00	Yes
Female	19	BIT	YEAR 1	3.00 - 3.49	No
Female	18	Engineering	YEAR 1	2.00 - 2.49	No
Female	18	Law	YEAR 3	3.00 - 3.49	No
Female	19	BIT	YEAR 1	2.50 - 2.99	No
Female	18	KIRKHS	YEAR 1	3.50 - 4.00	No
Female	24	Engineering	YEAR 2	2.50 - 2.99	Yes
Female	24	BIT	YEAR 3	3.00 - 3.49	No
Female	22	Engineering	YEAR 4	3.50 - 4.00	No
Female	20	Usuluddin	YEAR 2	3.00 - 3.49	No
Male	20	BIT	YEAR 1	0 - 1.99	No
Male	23	TAASL	YEAR 2	3.50 - 4.00	No
Male	18	BCS	YEAR 1	3.50 - 4.00	No
Female	19	Engineering	YEAR 1	3.50 - 4.00	No
Female	18	Engine	YEAR 4	3.50 - 4.00	No
Male	24	BCS	YEAR 2	3.00 - 3.49	No
Female	24	BCS	YEAR 3	3.50 - 4.00	No
Female	23	ALA	YEAR 1	2.50 - 2.99	Yes
Female	18	BCS	YEAR 2	3.50 - 4.00	No
Female	19	Biomedical science	YEAR 3	3.00 - 3.49	No
Female	20	koe	YEAR 3	3.00 - 3.49	Yes
Female	19	BCS	YEAR 1	3.50 - 4.00	No
Male	21	BCS	YEAR 1	3.00 - 3.49	No

Gender	Age	Major	Year	GPA	Married
Male	23	Kirkhs	YEAR 3	3.50 - 4.00	No
Female	20	BENL	YEAR 3	3.00 - 3.49	No
Female	18	BCS	YEAR 1	3.50 - 4.00	No
Female	23	Benl	YEAR 1	3.00 - 3.49	No
Female	18	IT	YEAR 3	3.00 - 3.49	No
Female	19	BCS	YEAR 1	3.50 - 4.00	No
Female	18	CTS	YEAR 1	3.50 - 4.00	No
Female	24	engin	YEAR 1	3.50 - 4.00	No
Female	24	Engine	YEAR 1	3.50 - 4.00	No
Female	23	Econs	YEAR 1	3.50 - 4.00	No
Female	18	KOE	YEAR 3	3.00 - 3.49	No
Male	19	MHSC	YEAR 3	3.00 - 3.49	Yes
Female	18	Malcom	YEAR 1	3.50 - 4.00	No
Female	24	Kop	YEAR 4	3.00 - 3.49	No
Female	24	Biomedical science	YEAR 1	3.00 - 3.49	No
Female	18	Laws	YEAR 3	3.50 - 4.00	No
Female	19	BIT	YEAR 3	3.00 - 3.49	Yes
Male	18	Biomedical science	YEAR 1	0 - 1.99	No
Male	24	BIT	YEAR 3	3.50 - 4.00	No
Female	24	KOE	YEAR 1	3.50 - 4.00	No
Female	23	Engineering	YEAR 1	3.00 - 3.49	No
Female	18	Human Sciences	YEAR 2	3.00 - 3.49	No
Female	19	Biotechnology	YEAR 3	0 - 1.99	No
Female	18	Engineering	YEAR 4	3.50 - 4.00	No
Female	24	Communication	YEAR 2	3.50 - 4.00	Yes
Female	24	Diploma Nursing	YEAR 2	3.50 - 4.00	No
Female	19	Engineering	YEAR 1	3.00 - 3.49	No
Female	19	Pendidikan Islam	YEAR 2	3.00 - 3.49	No
Male	23	Radiography	YEAR 1	3.00 - 3.49	No
Female	18	psychology	YEAR 1	3.50 - 4.00	No
Female	19	Fiqh fatwa	YEAR 3	3.00 - 3.49	No
Female	18	psychology	YEAR 1	3.50 - 4.00	No
Male	24	BIT	YEAR 1	3.00 - 3.49	No
Male	24	Engineering	YEAR 2	2.00 - 2.49	No
Female	23	DIPLOMA TESL	YEAR 3	3.50 - 4.00	No
Male	18	Koe	YEAR 2	3.00 - 3.49	No
Female	19	KOE	YEAR 2	3.00 - 3.49	Yes
Female	18	BENL	YEAR 1	3.00 - 3.49	No
Female	24	Fiqh	YEAR 3	0 - 1.99	No
Female	18	Islamic Education	YEAR 1	3.50 - 4.00	No
Female	21	BCS	YEAR 1	3.50 - 4.00	No
Male	18	Engineering	YEAR 2	3.00 - 3.49	No
Female	19	Nursing	YEAR 3	3.50 - 4.00	Yes
Female	23	Pendidikan Islam	YEAR 4	3.50 - 4.00	No
Male	20	Biomedical science	YEAR 2	3.00 - 3.49	No

Depressed	Anxiety	Panic	Treatment	STEM
Yes	No	Yes	No	Yes
No	Yes	No	No	No
Yes	Yes	Yes	No	Yes

Depressed	Anxiety	Panic	Treatment	STEM
Yes	No	No	No	No
No	No	No	No	Yes
No	No	Yes	No	Yes
Yes	No	Yes	No	No
No	Yes	No	No	Yes
No	No	No	No	No
No	Yes	Yes	No	No
No	No	No	No	Yes
Yes	No	No	No	Yes
Yes	No	No	No	Yes
No	No	No	No	Yes
No	Yes	No	No	No
No	No	No	No	Yes
No	No	No	No	No
Yes	Yes	Yes	No	No
No	Yes	No	No	Yes
Yes	Yes	Yes	No	Yes
No	No	Yes	No	Yes
No	No	No	No	Yes
No	No	No	No	Yes
No	No	No	No	Yes
Yes	Yes	Yes	No	Yes
No	No	No	No	No
No	No	No	No	Yes
Yes	Yes	No	No	Yes
Yes	Yes	Yes	Yes	Yes
No	No	No	No	Yes
No	No	No	No	No
No	No	No	No	Yes
No	No	Yes	No	Yes
Yes	Yes	No	Yes	Yes
Yes	Yes	Yes	No	Yes
No	No	No	No	Yes
Yes	Yes	No	No	No
Yes	Yes	Yes	No	Yes
No	No	No	No	No
Yes	No	Yes	Yes	Yes
No	Yes	No	No	Yes
No	No	No	No	Yes
Yes	No	No	No	No
No	No	No	No	Yes
No	No	Yes	No	No
No	Yes	Yes	No	Yes
No	Yes	No	No	Yes
No	No	No	No	Yes
Yes	No	No	No	Yes
No	No	Yes	No	Yes
Yes	No	Yes	Yes	No
No	Yes	No	No	Yes
No	No	No	No	Yes
Yes	Yes	Yes	No	Yes
Yes	No	Yes	Yes	Yes

Depressed	Anxiety	Panic	Treatment	STEM
No	No	No	No	Yes
No	No	No	No	No
Yes	Yes	No	No	No
No	No	No	No	Yes
No	No	No	No	No
No	No	Yes	No	Yes
No	No	No	No	Yes
No	No	Yes	No	Yes
No	No	Yes	No	Yes
No	No	No	No	Yes
Yes	Yes	No	No	No
No	Yes	No	No	Yes
Yes	No	Yes	No	No
Yes	No	No	No	No
No	Yes	No	No	Yes
No	No	No	No	Yes
No	No	Yes	No	No
Yes	No	No	No	Yes
No	No	No	No	Yes
No	Yes	No	No	Yes
No	Yes	Yes	No	Yes
Yes	No	No	No	Yes
No	No	Yes	No	No
No	No	No	No	Yes
No	No	No	No	Yes
Yes	Yes	Yes	No	No
No	No	No	No	No
Yes	Yes	No	No	Yes
No	No	No	No	No
No	No	No	No	Yes
Yes	Yes	No	Yes	Yes
No	No	No	No	No
Yes	Yes	Yes	No	Yes
No	Yes	No	No	Yes
No	No	Yes	No	Yes
No	No	Yes	No	No
No	Yes	No	No	Yes
Yes	No	No	No	Yes
Yes	No	No	No	No
No	No	Yes	No	No
No	No	No	No	No
No	Yes	No	No	Yes
Yes	Yes	No	No	Yes
Yes	No	Yes	No	No
No	No	No	No	No
No	No	No	No	Yes