

LSU ROWING

BOBBI HEBERMEHL

# TEAM INFORMATION

- LSU Rowing is a Sports Club through the University Recreation Center at Louisiana State University. This means the team is not funded nor supported. Meaning every member has to pay semester dues so the team, or organization, can buy equipment, entry into competitions, and uniforms. To be able to maintain our equipment and make sure we are eligible to race, we have to grow our team numbers. The following slides demonstrate what year of students we should be recruiting heavily and in what semester, how long members stay once they joined, and predicting the teams future growth pertaining to our budget. This was determined through Python, SQL, R, and the visuals were done in Tableau and PowerBi.

# Loaded the data into Python

```
[2]: import pandas as pd

[3]: from pandas import DataFrame

[4]: Data = {'Rower': ['AN', 'AR', 'AL', 'BK', 'CK', 'CC', 'CP', 'DW', 'FT', 'GR', 'GH', 'GK', 'IA', 'JE', 'JL', 'KN', 'LD', 'ME', 'NB', 'PH', 'PP', 'TR', 'UO', 'VS', 'AO', 'GH', 'MM', 'AW', 'TH'],
   'Grade': ['Junior', 'Senior', 'Sophomore', 'Junior', 'Sophomore', 'Sophomore', 'Sophomore', 'Sophomore', 'Sophomore', 'Junior', 'Senior', 'Senior'],
   'Semester Joined': ['Spring', 'Fall', 'Fall'],
   'Major': ['Science', 'Science', 'Science', 'Engineering', 'Fashion', 'Science', 'Science', 'English', 'Science', 'Business', 'Business', 'Fashion', 'English', 'Science', 'Engineering', 'Fashion', 'Science', 'Engineering', 'Science', 'Engineering', 'Business', 'Engineering', 'Engineering', 'Engineering', 'Business', 'Science', 'Nutrition', 'Business', 'Business', 'Engineering'],
   'N/V': ['N', 'V', 'V']}

df = DataFrame(Data, columns = ['Rower', 'Grade', 'Semester Joined', 'Major', 'N/V'])

[5]: print(df)
```

```
[5]: print(df)
```

	Rower	Grade	Semester	Joined	Major	N/V
0	AN	Junior		Spring	Science	N
1	AR	Senior		Fall	Science	V
2	AL	Sophomore		Fall	Science	V
3	BK	Junior		Fall	Engineering	V
4	CK	Sophomore		Fall	Fashion	V
5	CC	Sophomore		Fall	Science	V
6	CP	Sophomore		Fall	Science	V
7	DW	Sophomore		Fall	English	V
8	FT	Sophomore		Fall	Science	V
9	GR	Sophomore		Fall	Business	V
10	GH	Junior		Spring	Business	V
11	GK	Senior		Fall	Fashion	V
12	IA	Senior		Spring	English	N
13	JE	Sophomore		Fall	Science	V
14	JL	Junior		Fall	Engineering	V
15	KN	Senior		Fall	Fashion	V
16	LD	Junior		Fall	Science	V
17	ME	Junior		Spring	Engineering	V
18	NB	Senior		Fall	Engineering	V
19	PH	Sophomore		Fall	Business	V
20	PP	Senior		Spring	Engineering	N
21	TR	Senior		Fall	Engineering	V
22	UO	Sophomore		Fall	Engineering	V
23	VS	Junior		Spring	Business	V
24	AO	Sophomore		Spring	Science	V
25	GH	Freshman		Fall	Nutrition	V
26	MM	Freshman		Fall	Business	V
27	AW	Freshman		Fall	Business	V
28	TH	Freshman		Fall	Engineering	V



WHEN DO MOST MEMBERS JOIN IN THEIR  
COLLEGE CAREER?

# Took the count of each Grade

```
[6]: Grade = [ 'Junior', 'Senior', 'Sophomore', 'Junior', 'Sophomore', 'Junior', 'Sophomore', 'Sophomore', 'Junior', 'Senior', 'Junior', 'Senior', 'Freshman', 'Freshman', 'Freshman' ]
Grade.count('Senior')

[6]: 7

[7]: Grade = [ 'Junior', 'Senior', 'Sophomore', 'Junior', 'Sophomore', 'Junior', 'Sophomore', 'Sophomore', 'Junior', 'Senior', 'Senior', 'Senior', 'Senior', 'Senior', 'Senior', 'Senior', 'Senior', 'Senior', 'Junior', 'Senior', 'Freshman', 'Freshman', 'Freshman' ]
Grade.count('Junior')

[7]: 7

[8]: Grade = [ 'Junior', 'Senior', 'Sophomore', 'Junior', 'Sophomore', 'Junior', 'Sophomore', 'Sophomore', 'Junior', 'Senior', 'Senior', 'Senior', 'Senior', 'Senior', 'Senior', 'Senior', 'Senior', 'Senior', 'Junior', 'Senior', 'Freshman', 'Freshman', 'Freshman' ]
Grade.count('Freshman')

[8]: 4

[9]: Grade = [ 'Junior', 'Senior', 'Sophomore', 'Junior', 'Sophomore', 'Junior', 'Sophomore', 'Sophomore', 'Junior', 'Senior', 'Senior', 'Senior', 'Senior', 'Senior', 'Senior', 'Senior', 'Senior', 'Senior', 'Junior', 'Senior', 'Freshman', 'Freshman', 'Freshman' ]
Grade.count('Sophomore')

[9]: 11

[10]: lst = ['Junior', 'Senior', 'Sophomore', 'Junior', 'Sophomore', 'Junior', 'Sophomore', 'Sophomore', 'Junior', 'Senior', 'Senior', 'Senior', 'Senior', 'Senior', 'Senior', 'Senior', 'Senior', 'Senior', 'Junior', 'Senior', 'Freshman', 'Freshman', 'Freshman']
max(lst,key=lst.count)

[10]: 'Sophomore'
```

Deleted non-relevant columns...

In Python

```
[13]: df.drop('Major',axis=1)
```

```
[15]: del df['Rower']
```

and in SQL

```
14> SELECT GRADE, SEMESTERJOINED, N/V
15> FROM ROWING
16>
```

	Grade	Semester Joined	N/V
0	Junior	Spring	N
1	Senior	Fall	V
2	Sophomore	Fall	V
3	Junior	Fall	V
4	Sophomore	Fall	V
5	Sophomore	Fall	V
6	Sophomore	Fall	V
7	Sophomore	Fall	V
8	Sophomore	Fall	V
9	Sophomore	Fall	V
10	Junior	Spring	V
11	Senior	Fall	V
12	Senior	Spring	N
13	Sophomore	Fall	V
14	Junior	Fall	V
15	Senior	Fall	V
16	Junior	Fall	V
17	Junior	Spring	V
18	Senior	Fall	V
19	Sophomore	Fall	V
20	Senior	Spring	N
21	Senior	Fall	V
22	Sophomore	Fall	V
23	Junior	Spring	V
24	Sophomore	Spring	V
25	Freshman	Fall	V
26	Freshman	Fall	V
27	Freshman	Fall	V
28	Freshman	Fall	V

# Deleted non-relevant information...in Python

and in SQL

```
[22]: import numpy as np  
  
[29]: df2 = df[df.Grade != 'Freshman']
```

```
[32]: df3 = df2[df2.Grade != 'Junior']  
  
[33]: df3
```

```
[34]: df4 = df3[df3.Grade != 'Senior']  
  
[35]: df4  
##show bar graph in Tableau
```

	Grade	Semester Joined	N/V
2	Sophomore	Fall	V
4	Sophomore	Fall	V
5	Sophomore	Fall	V
6	Sophomore	Fall	V
7	Sophomore	Fall	V
8	Sophomore	Fall	V
9	Sophomore	Fall	V
13	Sophomore	Fall	V
19	Sophomore	Fall	V
22	Sophomore	Fall	V
24	Sophomore	Spring	V

```
20> SELECT GRADE, SEMESTERJOINED, N/V  
21> FROM ROWING  
22> ORDER BY GRADE  
23>  
24>
```

## Took statistics to determine team retention

```
[108]: df['N/V'].value_counts('V')  
##represents retention rate  
  
[108]: V    0.896552  
      N    0.103448  
      Name: N/V, dtype: float64  
  
[103]: df['Semester Joined'].value_counts('Fall')  
##represents when to recruit heavy for Sophomores  
  
[103]: Fall     0.758621  
      Spring   0.241379  
      Name: Semester Joined, dtype: float64
```

# FALL SOPHOMORES

- After taking the count of each grade I discovered Sophomore year is the year most people join the team. Though what matters is that they stick around and not just join. Once I narrowed the table to only sophomores, I took the ratio of those members that were Novice(on the team for one year) or Varsity(has been on the team for longer than a year) to determine our retention rate. Varsity came out with a greater retention rate of .89, or 89%, which shows us that members who join Sophomore year are most likely to stay longer than a year. I also determined the retention rate for Sophomores who joined in the Fall or Spring. The Fall had a retention rate of about a .76, or 76%, showing us that members who join in the Fall are more likely to stay for longer than a year.



# HOW LONG DO MEMBERS STAY?

# Added a column of information...

```
[53]: Data['Year Joined'] = [19,17,18,16,18,18,18,18,18,18,18,16,19,19,18,16,17,18,18,18,18,19,16,18,18,18,15,15,14,17]
print('\n\nDataFrame after adding "Year Joined" column\n-----')
print(Data)
```

DataFrame after adding "Year Joined" column

```
[56]: df = DataFrame (Data, columns = ['Rower', 'Grade', 'Semester Joined', 'Major', 'N/V', 'Year Joined'])  
##added year joined column to represent commitment
```

[57]: df

[57]:	Rower	Grade	Semester Joined	Major	N/V	Year Joined
0	AN	Junior	Spring	Science	N	19
1	AR	Senior	Fall	Science	V	17
2	AL	Sophomore	Fall	Science	V	18
3	BK	Junior	Fall	Engineering	V	16
4	CK	Sophomore	Fall	Fashion	V	18
5	CC	Sophomore	Fall	Science	V	18
6	CP	Sophomore	Fall	Science	V	18
7	DW	Sophomore	Fall	English	V	18
8	FT	Sophomore	Fall	Science	V	18
9	GR	Sophomore	Fall	Business	V	18
10	GH	Junior	Spring	Business	V	18
11	GK	Senior	Fall	Fashion	V	16
12	IA	Senior	Spring	English	N	19
13	JE	Sophomore	Fall	Science	V	19
14	JL	Junior	Fall	Engineering	V	18
15	KN	Senior	Fall	Fashion	V	16
16	LD	Junior	Fall	Science	V	17
17	ME	Junior	Spring	Engineering	V	18
18	NB	Senior	Fall	Engineering	V	18
19	PH	Sophomore	Fall	Business	V	18
20	PP	Senior	Spring	Engineering	N	19
21	TR	Senior	Fall	Engineering	V	16
22	UO	Sophomore	Fall	Engineering	V	18
23	VS	Junior	Spring	Business	V	18
24	AO	Sophomore	Spring	Science	V	18
25	GH	Freshman	Fall	Nutrition	V	15
26	MM	Freshman	Fall	Business	V	15
27	AW	Freshman	Fall	Business	V	14
28	TH	Freshman	Fall	Engineering	V	17

# in Python

# and in SQL

```
33> INSERT INTO 'ROWING'('ROWER', 'GRADE', 'SEMESTERJOINED', 'MAJOR', 'N/V', 'YEARJOINED')
34> VALUES(19,17,18,16,18,18,18,18,18,18,18,16,19,19,18,16,17,18,18,18,19,16,18,18,18,15,15,14,17)
```

# Took the counts of each year

```
[61]: YearJoined = ['19','17','18','16','18','18','18','18','18','18','19','18','16','18','17','18','18','19','16','18','18','18','18','15','15','14','17']
YearJoined.count('15')

[61]: 2

[62]: YearJoined = ['19','17','18','16','18','18','18','18','18','18','19','18','16','18','17','18','18','19','16','18','18','18','15','15','14','17']
YearJoined.count('16')

[62]: 4

[63]: YearJoined = ['19','17','18','16','18','18','18','18','18','18','19','18','16','17','18','18','19','16','18','18','18','15','15','14','17']
YearJoined.count('17')

[63]: 3

[64]: YearJoined = ['19','17','18','16','18','18','18','18','18','18','19','18','16','17','18','18','19','16','18','18','18','15','15','14','17']
YearJoined.count('18')

[64]: 15

[65]: YearJoined = ['19','17','18','16','18','18','18','18','18','18','19','18','16','17','18','18','19','16','18','18','18','15','15','14','17']
YearJoined.count('19')

[65]: 4
```

	Rower	Grade	Semester Joined	Major	N/V	Year Joined
1	AR	Senior	Fall	Science	V	17
3	BK	Junior	Fall	Engineering	V	16
10	GH	Junior	Spring	Business	V	18
11	GK	Senior	Fall	Fashion	V	16
14	JL	Junior	Fall	Engineering	V	18
15	KN	Senior	Fall	Fashion	V	16
16	LD	Junior	Fall	Science	V	17
17	ME	Junior	Spring	Engineering	V	18
18	NB	Senior	Fall	Engineering	V	18
21	TR	Senior	Fall	Engineering	V	16
23	VS	Junior	Spring	Business	V	18
25	GH	Freshman	Fall	Nutrition	V	15
26	MM	Freshman	Fall	Business	V	15
27	AW	Freshman	Fall	Business	V	14
28	TH	Freshman	Fall	Engineering	V	17

Ascending  
order



	Rower	Grade	Semester Joined	Major	N/V	Year Joined
27	AW	Freshman	Fall	Business	V	14
26	MM	Freshman	Fall	Business	V	15
25	GH	Freshman	Fall	Nutrition	V	15
3	BK	Junior	Fall	Engineering	V	16
21	TR	Senior	Fall	Engineering	V	16
11	GK	Senior	Fall	Fashion	V	16
15	KN	Senior	Fall	Fashion	V	16
28	TH	Freshman	Fall	Engineering	V	17
1	AR	Senior	Fall	Science	V	17
16	LD	Junior	Fall	Science	V	17
24	AO	Sophomore	Spring	Science	V	18
23	VS	Junior	Spring	Business	V	18
22	UO	Sophomore	Fall	Engineering	V	18
19	PH	Sophomore	Fall	Business	V	18
18	NB	Senior	Fall	Engineering	V	18
17	ME	Junior	Spring	Engineering	V	18
14	JL	Junior	Fall	Engineering	V	18
10	GH	Junior	Spring	Business	V	18

Deleted non-relevant information...  
in Python

```
[84]: ##if joined before </= 18 they should be V
df10 = df6.drop(df6.index[0])
df10
```

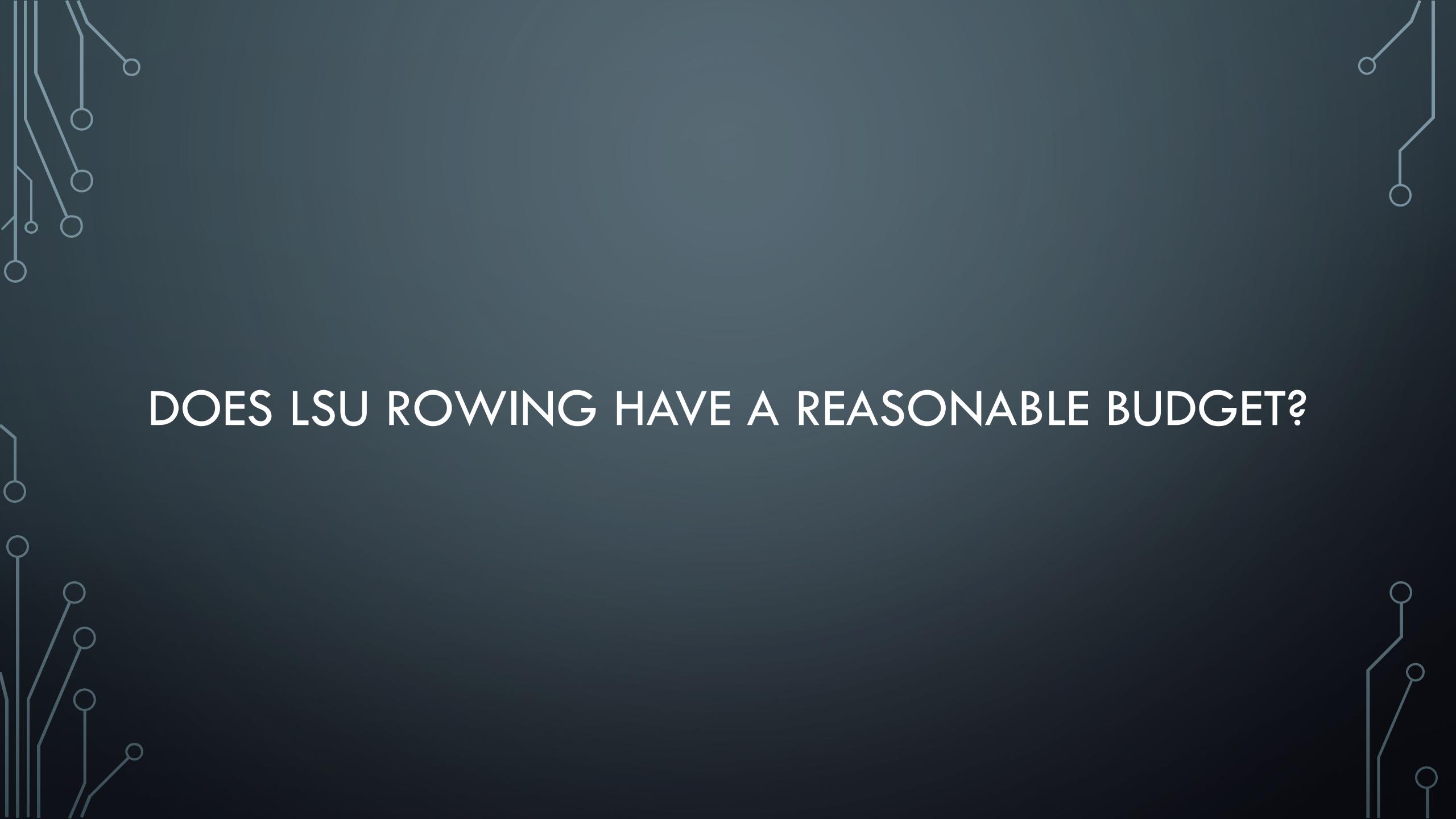
```
[97]: df11 = df10[df10.Rower != 'IA']
df11
```

```
[98]: df12 = df11[df11.Rower != 'PP']
df12
```

and in SQL

```
25> TRUNCATE TABLE ROWER;
26> DELETE FROM YEARJOINED
27> WHERE YEARJOINED=19;
```

- After taking the count of the year each member joined I established each year we grew. Though after compiling all the information for members who joined before 2019, you can see that our retention rate is 100%. All the members stayed until they were Varsity and longer. This shows that our problem doesn't lie in keeping members, because our results prove that most of the time our members will stay once they join.



# DOES LSU ROWING HAVE A REASONABLE BUDGET?

# Loaded appropriate data into R

Placed Year Joined column into  
descending order...  
in R

```
[2]: # Create the data frame.  
rowing.data <- data.frame(  
    rowing_id = c (1:29),  
    rowing_name = c('AN','AR','AL','BK','CK','CC','CP','DW','FT','GR','GH','GK','IA','JE','JL','KN','LD','ME','NB','PH','PP','TR','UO','VS','AO','GH','MM','AW','TH'),  
    rowing_cost = c(250, 250, 250, 250, 250, 250, 250, 250, 250, 250, 250, 250, 250, 250, 250, 250, 250, 250, 250, 250, 250, 250, 250, 250, 250, 250, 250, 250, 250, 250, 250, 250, 250),  
    rowing_yearjoined = c(19, 17, 18, 16, 18, 18, 18, 18, 18, 18, 16, 19, 19, 18, 16, 17, 18, 18, 18, 19, 16, 18, 15, 14, 17),  
  
    stringsAsFactors = FALSE  
)  
# Print the data frame.  
print(rowing.data)  
  
  rowing_id rowing_name rowing_cost rowing_yearjoined  
1         1        AN     250            19  
2         2        AR     250            17  
3         3        AL     250            18  
4         4        BK     250            16  
5         5        CK     250            18  
6         6        CC     250            18  
7         7        CP     250            18  
8         8        DW     250            18  
9         9        FT     250            18  
10        10       GR     250            18  
11        11       GH     250            18  
12        12       GK     250            16  
13        13       IA     250            19  
14        14       JE     250            19  
15        15       JL     250            18  
16        16       KN     250            16  
17        17       LD     250            17  
18        18       ME     250            18  
19        19       NB     250            18  
20        20       PH     250            18  
21        21       PP     250            19  
22        22       TR     250            16  
23        23       UO     250            18  
24        24       VS     250            18  
25        25       AO     250            18  
26        26       GH     250            15  
27        27       MM     250            15  
28        28       AW     250            14  
29        29       TH     250            17
```

```
[3]: sort.default(rowing.data$rowing_yearjoined, decreasing=TRUE)  
  
1. 19  
2. 19  
3. 19  
4. 19  
5. 18  
6. 18  
7. 18  
8. 18  
9. 18  
10. 18  
11. 18  
12. 18  
13. 18  
14. 18  
15. 18  
16. 18  
17. 18  
18. 18  
19. 18  
20. 17  
21. 17  
22. 17  
23. 16  
24. 16  
25. 16  
26. 16  
27. 15  
28. 15  
29. 14
```

And in SQL

```
28>  
29> SELECT YEARJOINED  
30> FROM ROWING  
31> ORDER BY YEARJOINED DESC  
32>
```

# Took the count of each year

```
[4]: x_basis=18  
##minimum number of members on the team  
b_cost=250  
##se  
x_19=4  
x_18=15  
x_17=3  
x_16=4  
x_15=2  
X_14=1
```

Results of semesterly  
income

```
[17]: y_19=5500  
y_18=8250  
y_17=5250  
y_16=5500  
y_15=5000  
y_14=4750
```

```
[5]: print(x_basis+x_19)  
[1] 22  
  
[6]: print(22*b_cost)  
[1] 5500  
  
[7]: print(x_basis+x_18)  
[1] 33  
  
[8]: print(33*b_cost)  
[1] 8250  
  
[9]: print(x_basis+x_17)  
[1] 21  
  
[10]: print(21*b_cost)  
[1] 5250  
  
[11]: print(x_basis+x_16)  
[1] 22  
  
[12]: print(22*b_cost)  
[1] 5500  
  
[13]: print(x_basis+x_15)  
[1] 20  
  
[14]: print(20*b_cost)  
[1] 5000  
  
[15]: print(x_basis+X_14)  
[1] 19  
  
[16]: print(19*b_cost)  
[1] 4750
```

- Added our minimum amount of team members(`x_basis`) and the number of people who joined each year
- Took that result and multiplied it by the semester cost per member(`b_cost`)

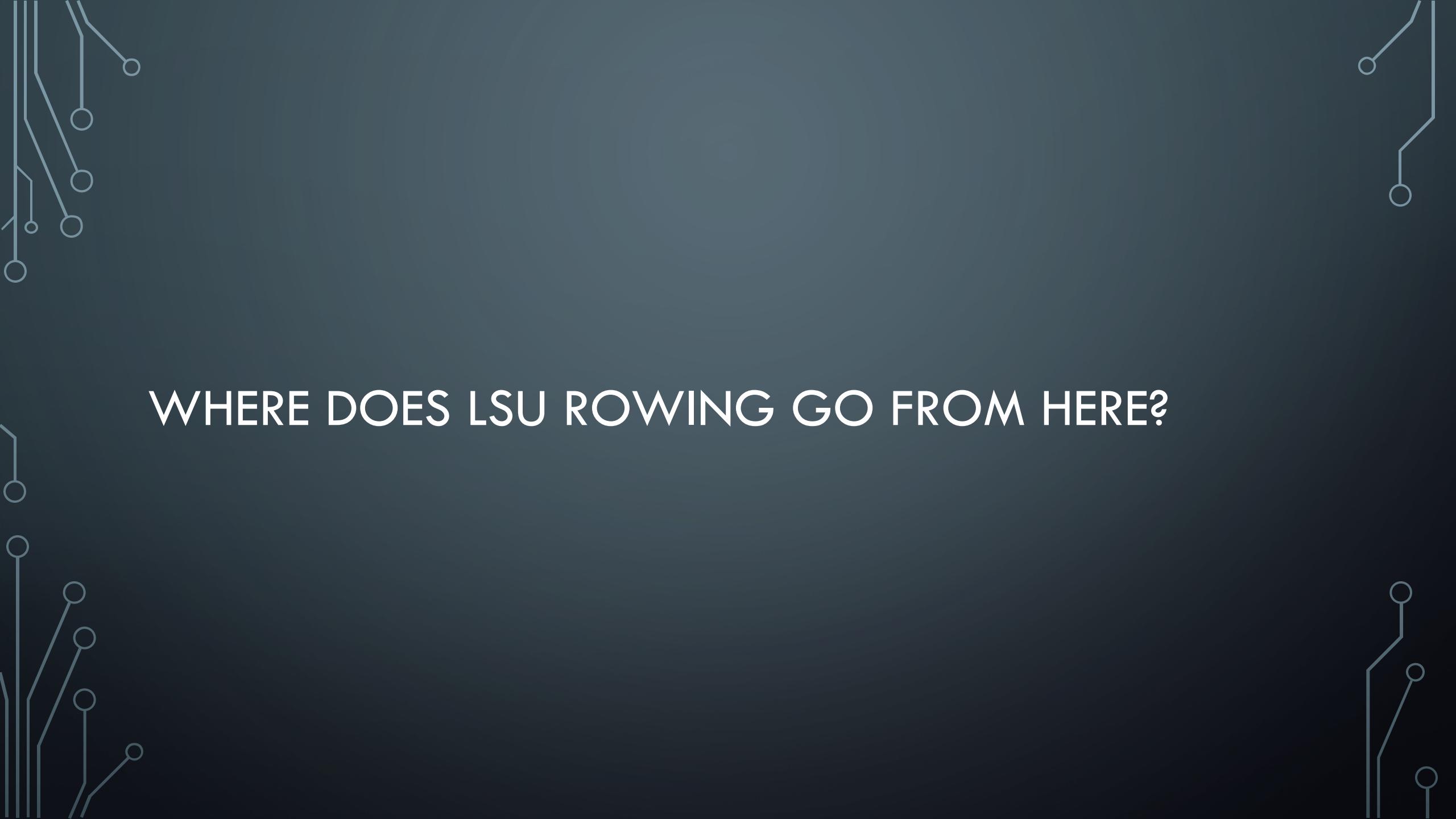
# Inserted required semesterly costs

```
[18]: regatta_cost=400  
regatta_total=4  
print(regatta_cost*regatta_total)  
  
[1] 1600
```

```
[20]: print(rowing_shirts+rowing_gear+rowing_equipment)  
[1] 1600  
  
[21]: 1600+1600  
3200  
  
[22]: total_14=print(y_14 - 3200)  
[1] 1550  
  
[23]: total_15=print(y_15 - 3200)  
[1] 1800  
  
[24]: total_16=print(y_16 - 3200)  
[1] 2300  
  
[25]: total_17=print(y_17 - 3200)  
[1] 2050  
  
[26]: total_18=print(y_18- 3200)  
[1] 5050  
  
[27]: total_19=print(y_19 - 3200)  
[1] 2300
```

- Determined how much we spend on regattas semesterly
- Subtracted that result from our semesterly income

- After determining how much we make a semester from members paying their required dues and how much we have to pay in order for us to stay afloat, we determined LSU Rowings net income has relatively been increasing over the years. This proves that our problem doesn't lie in operating costs, but more so in recruiting. The results showed in 2018 that we had a larger margin of safety than in the past. The members that joined that year was at an all time high of 15.

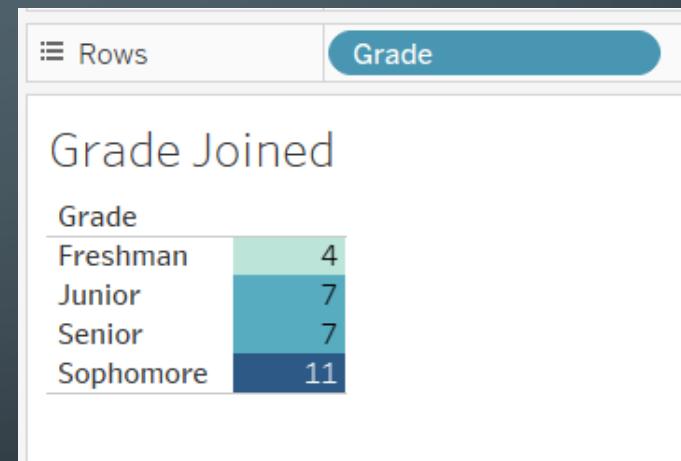
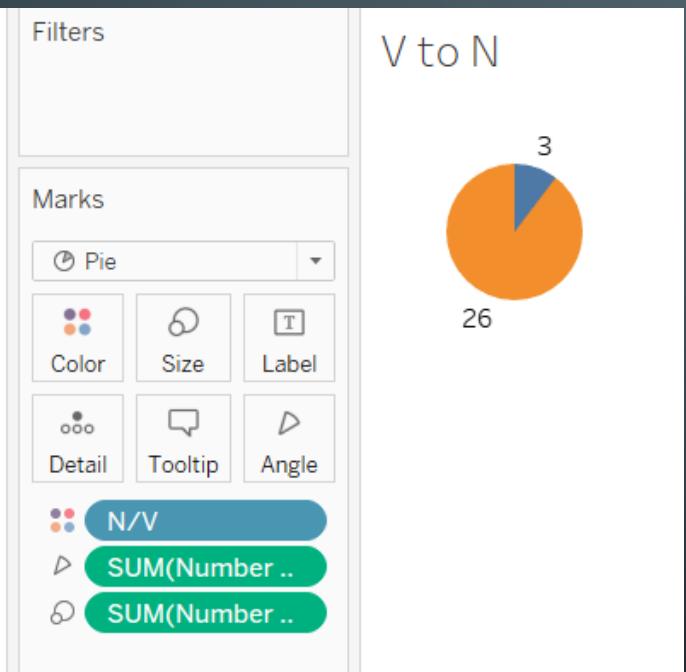
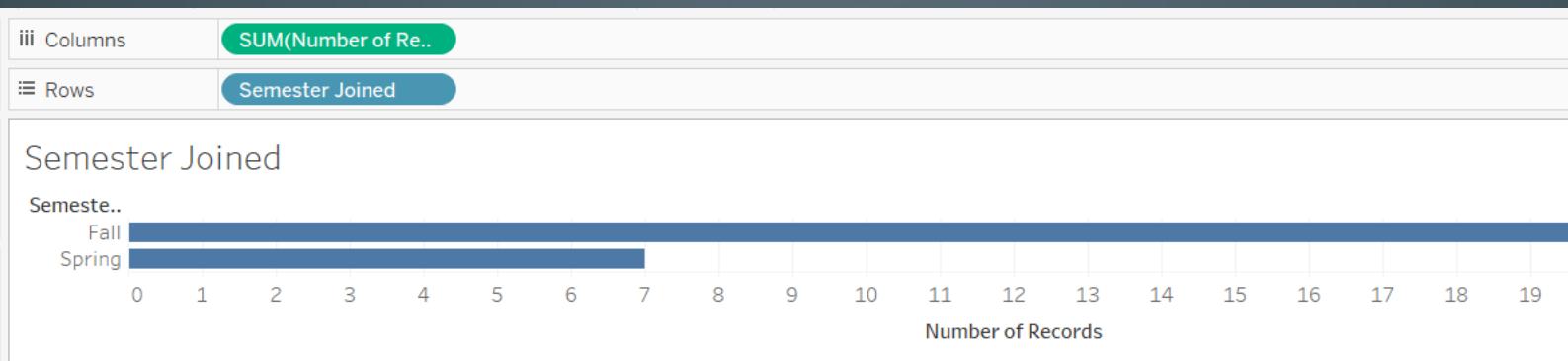


WHERE DOES LSU ROWING GO FROM HERE?

# RESULTS

- Majority of members join their Sophomore year
- Majority of members who stay longer than a year joined their Fall Semester
- Majority of members stay throughout their college career

# HOW DO WE HOLD THIS TO BE TRUE?



Displayed results in  
Tableau



# THANK YOU FOR VIEWING

ANALYSIS AND VISUALIZING DONE BY: BOBBI HEBERMEHL