



IS COLLEGE WORTH IT?

GROUP 4:

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PROJECT DESCRIPTION

This project investigates if there is a correlation between the typical education level required for a job and the median average wage for that job in the U.S.

Additionally, this project looks at predictors of college graduation rates to determine if school size, type, or selectivity make a difference in graduation rates.

DATA SOURCES

Date Source	Rationale	Inclusion Criteria	Exclusion Criteria
U.S. Bureau of Labor & Statistics (Employment Projections (bls.gov))	<ul style="list-style-type: none">• from a trustworthy government agency, available to the public, and easy to access.• 832 occupations	<ul style="list-style-type: none">• Year 2021• All job categories	<ul style="list-style-type: none">• All other years

DATA SOURCES

Date Source	Rationale	Inclusion Criteria	Exclusion Criteria
Integrated Post Secondary Education Data System (IPEDS) (https://nces.ed.gov/ipeds/use-the-data)	<ul style="list-style-type: none">• We compared IPEDS with College Scorecard and found that IPEDS aligned better with our data needs – IPEDS offered more data variables and allowed for greater report customization.	<ul style="list-style-type: none">• Colleges that offer 4 year bachelor degrees.• Full-time, first-time, degree-seeking students who started and finished at the same institution.	<ul style="list-style-type: none">• online programs• non-degree granting institutions

APPROACH TO DATA ANALYSIS

STEP 1

**Explored
potential
data sources**

STEP 2

**Selected
dataset to
be used**

STEP 3

**Downloaded
data and
saved as CSV
file**

STEP 4

**Imported
CSV files
into Jupyter
Notebook**

STEP 5

**Analyzed
data as a
team**

Data Analysis

QUESTION 1

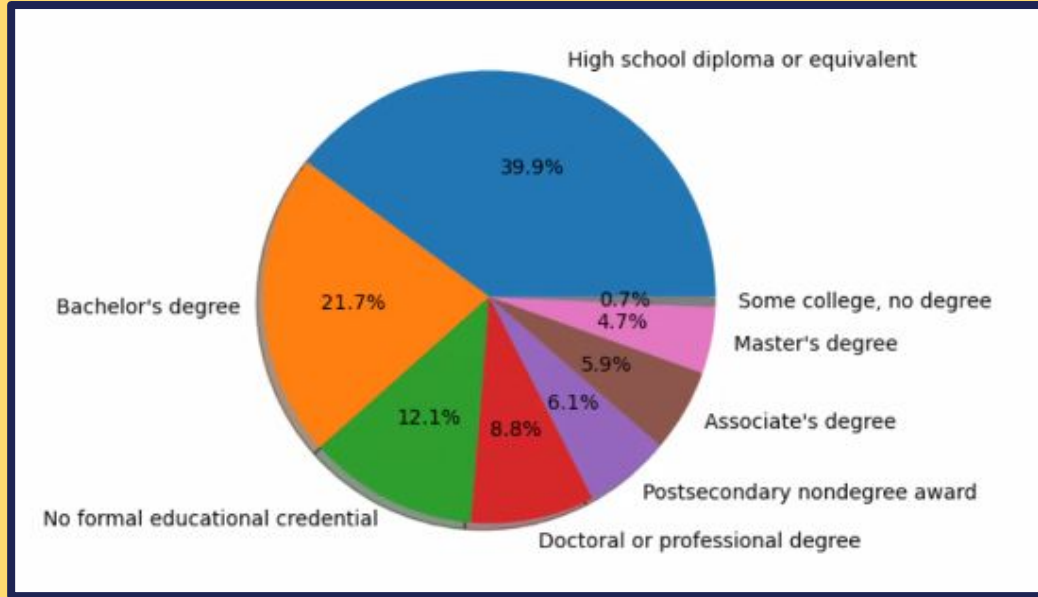
Is there a correlation between the typical education level required for a job and the wage for that job in the U.S.?

	Occupation Title	Occupation Code	Employment 2021	Employment 2031	Employment Change, 2021-2031	Employment Percent Change, 2021-2031	Occupational Openings, 2021-2031 Annual Average	Median Annual Wage 2021	Typical Entry-Level Education
0	Accountants and auditors * Account Auditor*...	="13-2011"	1,449.8	1,531.6	81.8	5.6	136.4	77,250	Bachelor's degree
1	Actors * Actor Understudy* Actress* Dramati...	="27-2011"	50.6	54.7	4.1	8.2	7.0	NaN	Some college, no degree
2	Actuaries * Actuarial Associate* Actuarial ...	="15-2011"	28.3	34.2	5.9	20.8	2.4	105,900	Bachelor's degree
3	Acupuncturists	="29-1291"	23.7	24.6	0.9	3.9	1.7	60,570	Master's degree
4	Adhesive bonding machine operators and tenders...	="51-9191"	12.7	12.9	0.2	1.5	1.6	37,630	High school diploma or equivalent

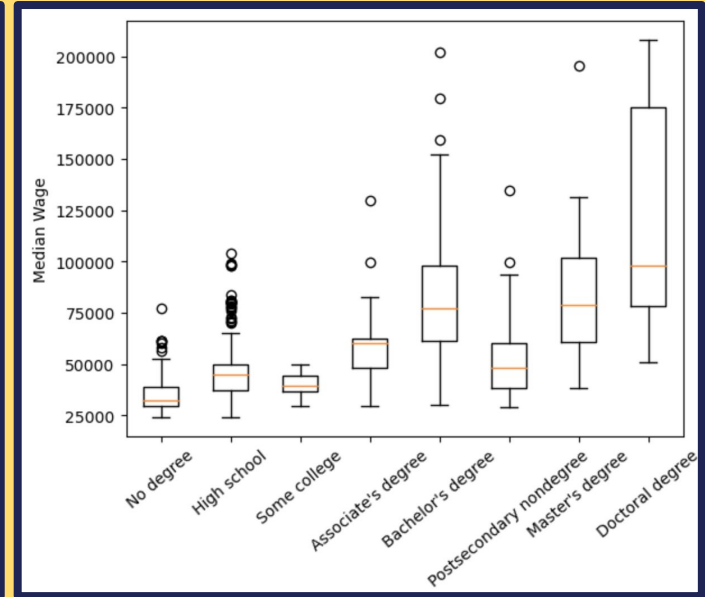
Data: U.S. Bureau of Labor & Statistics ([Employment Projections \(bls.gov\)](https://www.bls.gov/employment-projections))

QUESTION 1

Percentage of Opportunities
per Entry-Level Degree

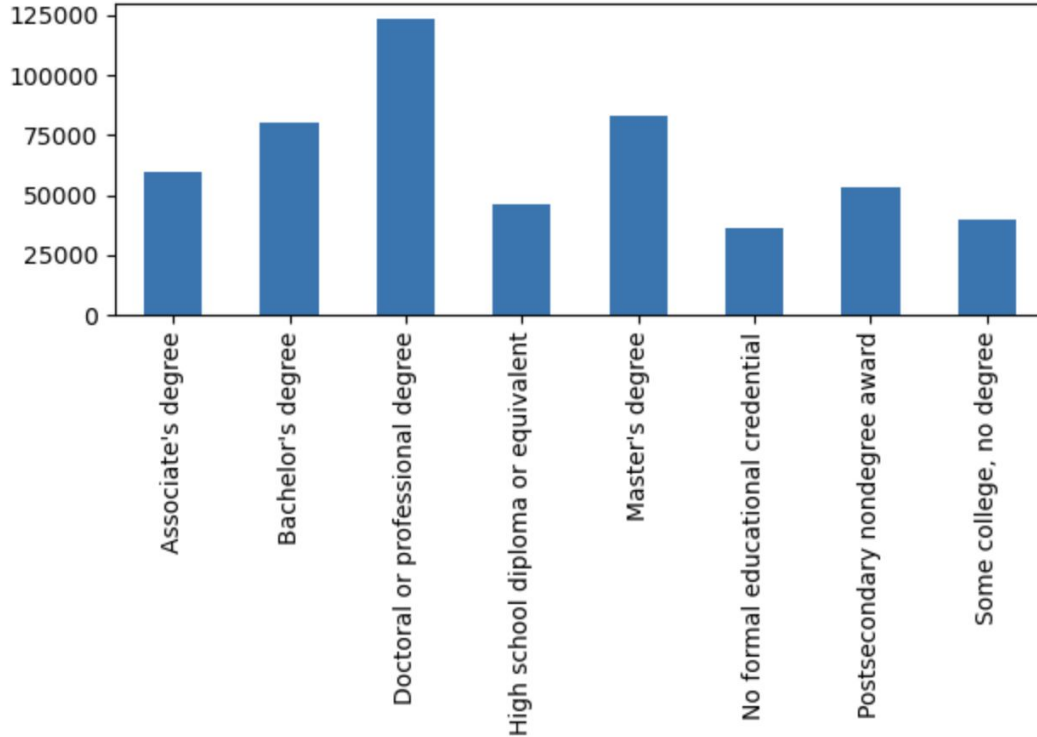


Median Wage Level by
Education Level



Data: U.S. Bureau of Labor & Statistics ([Employment Projections \(bls.gov\)](https://www.bls.gov))

TYPICAL ENTRY-LEVEL EDUCATION



- ◆ Median Wages are significantly different based on Entry-Level degrees.
- ◆ ANOVA shows that the P-Value is less than 0.05

Conclusion:

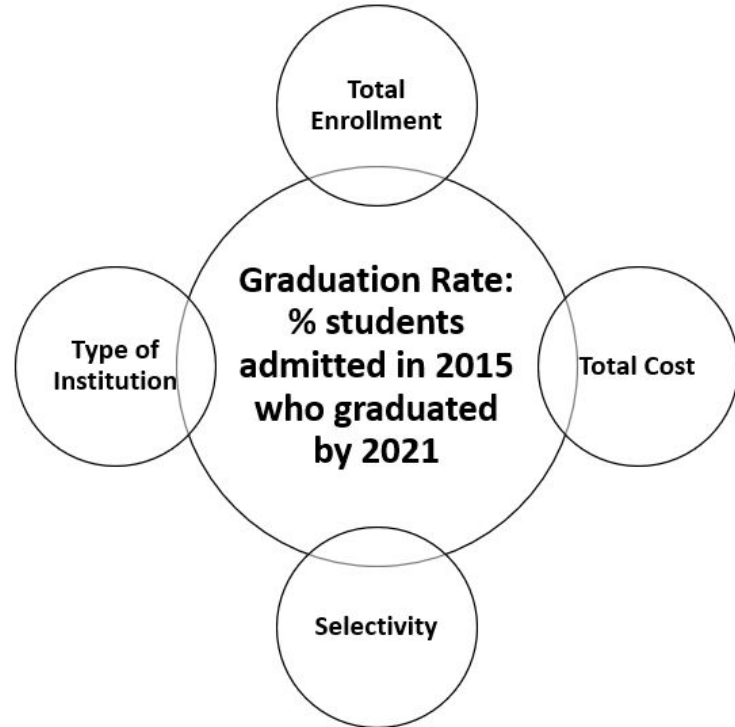
The null hypothesis is rejected based on the low p-value. Median annual wage differs significantly across Education Levels. The average wage for jobs that require the doctoral degree is the highest while it is lowest for the jobs that require no formal education.

QUESTION 2

Is there a relationship between institutional characteristics

- size (total enrollment)
- total cost (off-campus student)
- selectivity (acceptance rate)
- type of institution (public or private)

on six-year graduation rates of bachelor's degree students who entered U.S. colleges in Aug 2015?



QUESTION 2- CLEAN UP (DROPPED MISSING VALUES)

Institution Name	Sector of institution (HD2015)	Percent admitted - total (DRVADM2015_RV)	Admissions yield - full time (DRVADM2015_RV)	Total enrollment (DRVEF2015_RV)	Graduation rate total cohort (DRVGR2015_RV)	Sector of institution (HD2014)	Total price for in-district students living off campus (not with family) 2014-15 (DRVIC2014)
Aaniih Nakoda College	4.0	NaN	NaN	219.0	31.0	4.0	17030.0
Abilene Christian University	2.0	50.0	20.0	4544.0	61.0	2.0	43100.0
Abilene Christian University- Undergraduate Online	NaN	NaN	NaN	NaN	NaN	NaN	NaN
Abraham Baldwin Agricultural College	1.0	77.0	55.0	3393.0	18.0	1.0	12504.0
Abraham Lincoln University	NaN	NaN	NaN	NaN	NaN	NaN	NaN

2,379
institutions



Institution Name	Sector of institution (HD2015)	Percent admitted - total (DRVADM2015_RV)	Admissions yield - full time (DRVADM2015_RV)	Total enrollment (DRVEF2015_RV)	Graduation rate total cohort (DRVGR2015_RV)	Sector of institution (HD2014)	Total price for in-district students living off campus (not with family) 2014-15 (DRVIC2014)
Abilene Christian University	2.0	50.0	20.0	4544.0	61.0	2.0	43100.0
Abraham Baldwin Agricultural College	1.0	77.0	55.0	3393.0	18.0	1.0	12504.0
Adams State University	1.0	64.0	25.0	3404.0	27.0	1.0	21064.0
Adelphi University	2.0	72.0	13.0	7256.0	67.0	2.0	48900.0
Adrian College	2.0	61.0	16.0	1715.0	54.0	2.0	41182.0
...
Yeshivath Viznitz	2.0	100.0	100.0	651.0	84.0	2.0	25314.0
Yeshivath Zichron Moshe	2.0	100.0	100.0	178.0	25.0	2.0	28814.0
York College	2.0	44.0	41.0	410.0	42.0	2.0	25430.0

QUESTION 2

```
# Generate descriptive statistics for graduation rate across institutions  
grad_2015["Graduation rate total cohort (DRVGR2015_RV)"].describe()
```

count	1367.000000	1367 four year degree granting institutions in the U. S.
mean	54.626920	
std	17.665878	
min	0.000000	
25%	42.000000	
50%	55.000000	
75%	67.000000	
max	100.000000	

Name: Graduation rate total cohort (DRVGR2015_RV), dtype: float64

QUESTION 2

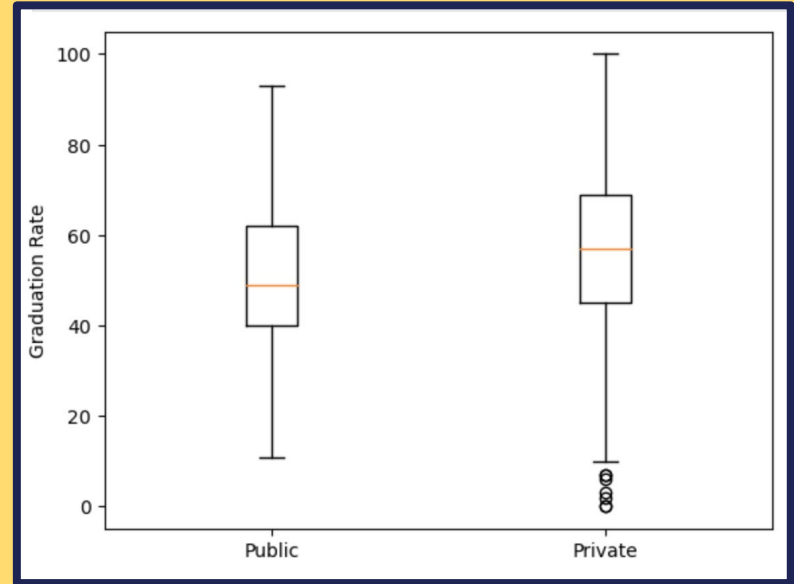
495 public institutions
897 private institutions

Mean

Public 50.6%

Private 56.7%

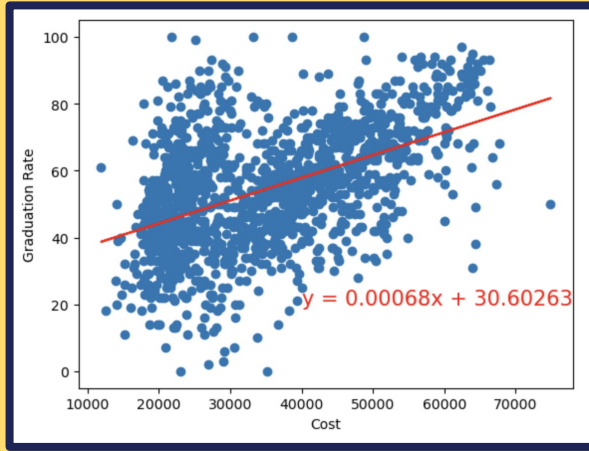
Private institutions have significantly higher mean graduation rates as compared to public institutions, $p = < 0.05$



```
# Run a ttest on graduation rates for public and private institutes
stats.ttest_ind(type_public['Graduation rate total cohort (DRVGR2015_RV)'], type_private['Graduation rate total cohort (DRVGR2015_RV)'])
```

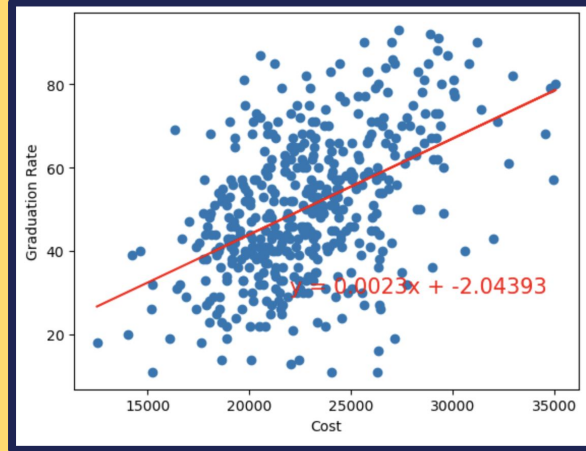
```
Ttest_indResult(statistic=-6.164301805216337, pvalue=1.038344477349493e-09)
```

COST VS GRADUATION RATES



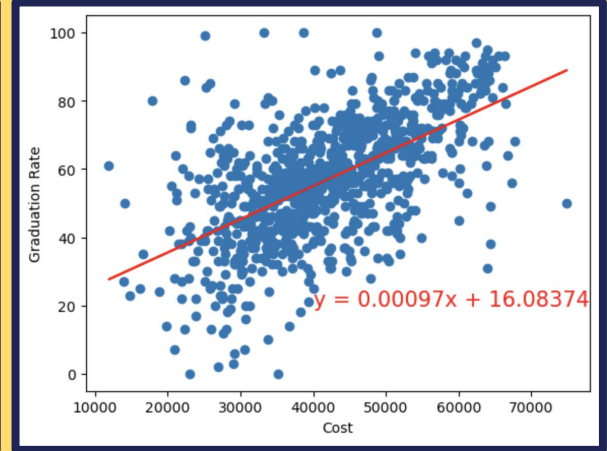
All institutions

r squared = 0.24



Public Institutions

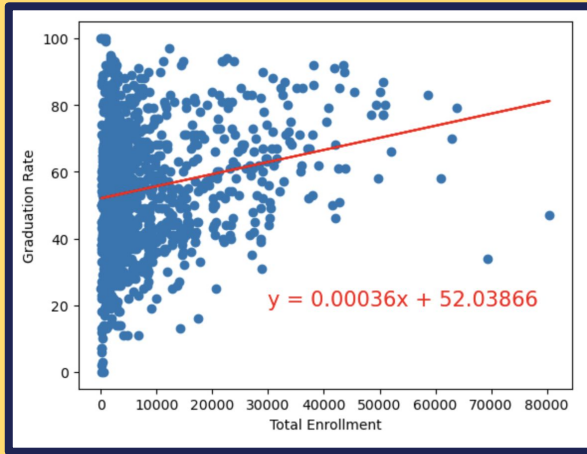
r squared = 0.23



Private Institutions

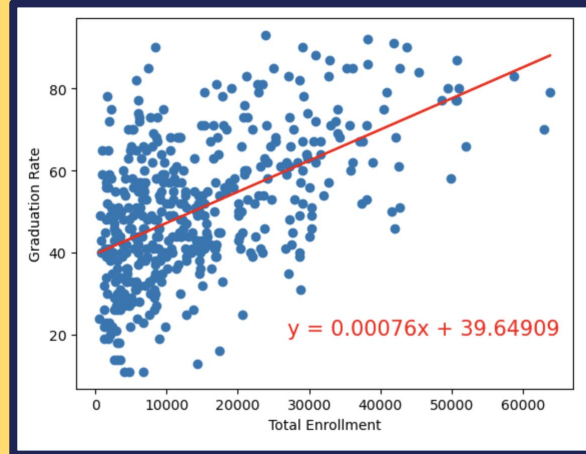
r squared = 0.36

ENROLLMENT VS GRADUATION RATES



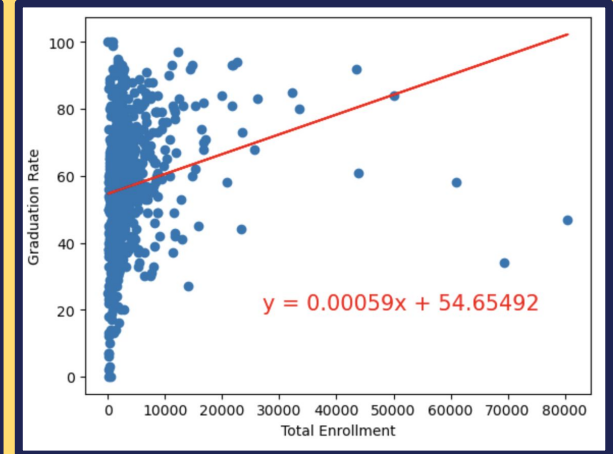
All institutions

r squared = 0.04



Public Institutions

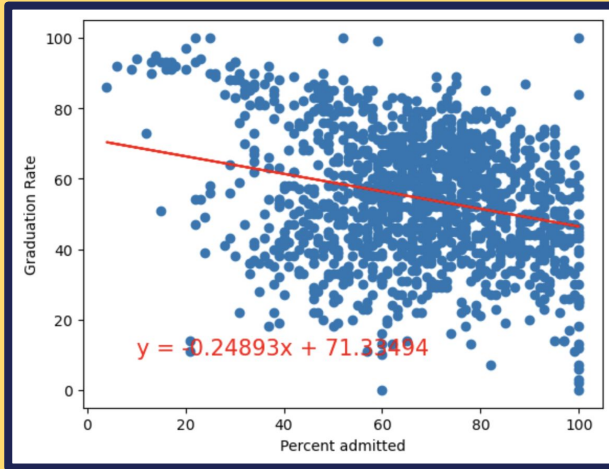
r squared = 0.29



Private Institutions

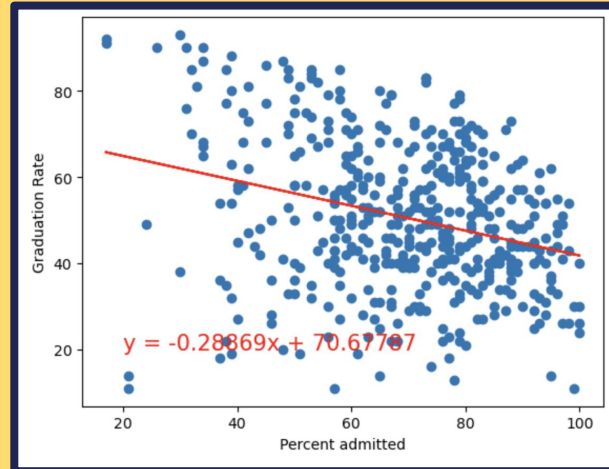
r squared = 0.04

PERCENT ADMITTED VS GRADUATION RATES



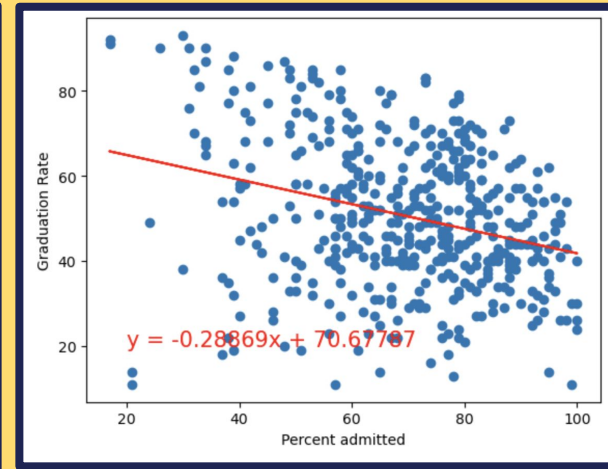
All institutions

r squared = 0.07



Public Institutions

r squared = 0.08



Private Institutions

r squared = 0.05

MAJOR FINDINGS

- **There a positive relationship between the typical education level required for a job and the wage for that job in the U.S.**
- Graduation rates were higher in private than public institutions ($p < 0.05$), however there were several outliers for the private school data.
- Graduation rates were higher for more expensive institutions
- At public institutions, graduation rates were higher for larger institutions
- There was no relationship between graduation rates and selectivity

LIMITATIONS OF OUR DATA ANALYSIS

- BLS:
 - is survey data
 - Median Wages do not indicate “entry-level” or more experience in the field.
- IPEDS:
 - is survey data
 - Not all institutions report; Institutions that do report do not always report all data.
 - The reason is unknown for students not graduating from specific institutions.

NEXT STEPS/FUTURE IMPROVEMENTS

- Evaluate college retention rates
- Investigate wages and graduation by field of study
- Investigate amount of student debt

THANKS!



Questions?

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