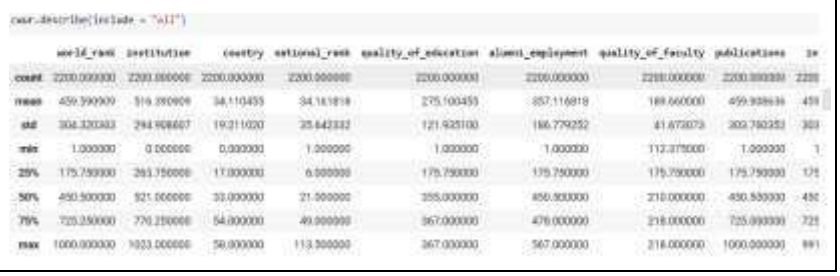
Data Collection and Preprocessing Phase

Date	06 July 2024
Team ID	739973
Project Title	SmartLender – Envisioning Success: Predicting University Scores With Machine Learning
Maximum Marks	6 Marks

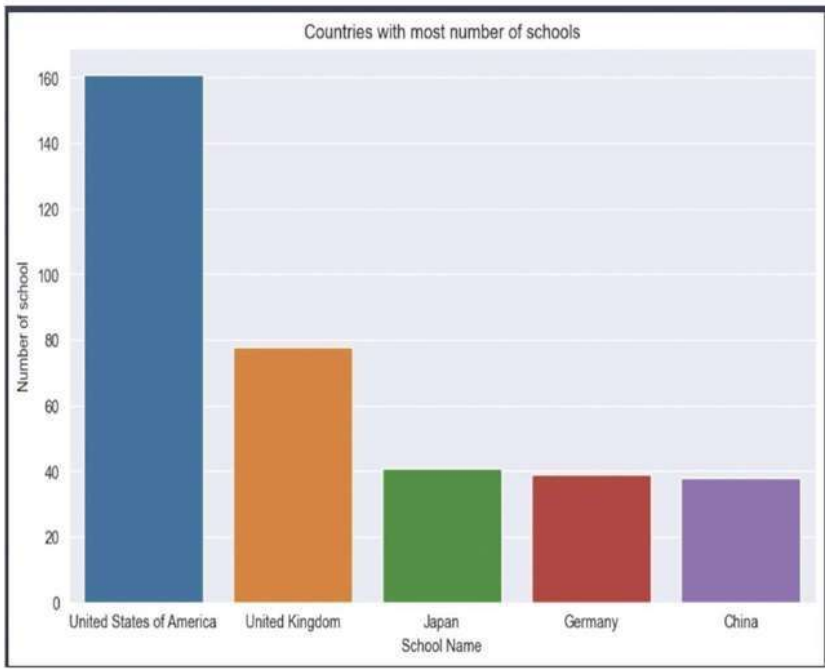
Data Exploration and Preprocessing Report

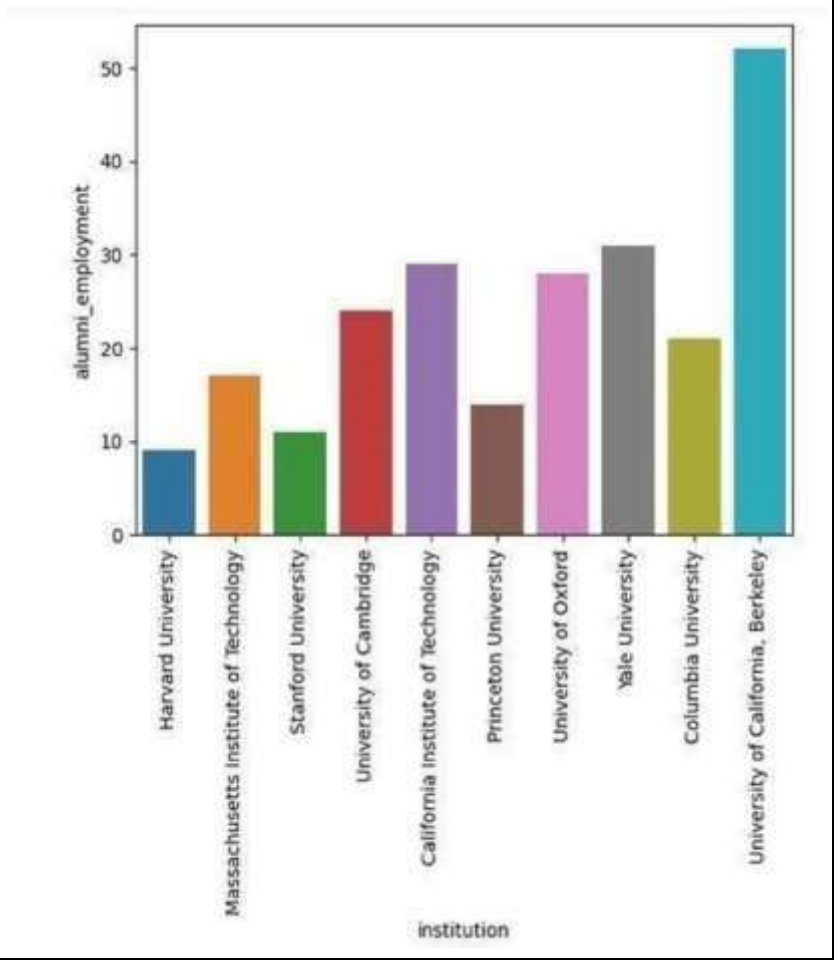
Dataset variables will be statistically analyzed to identify patterns and outliers, with Python employed for preprocessing tasks like normalization and feature engineering. Data cleaning will address missing values and outliers, ensuring quality for subsequent analysis and modeling, and forming a strong foundation for insights and predictions.

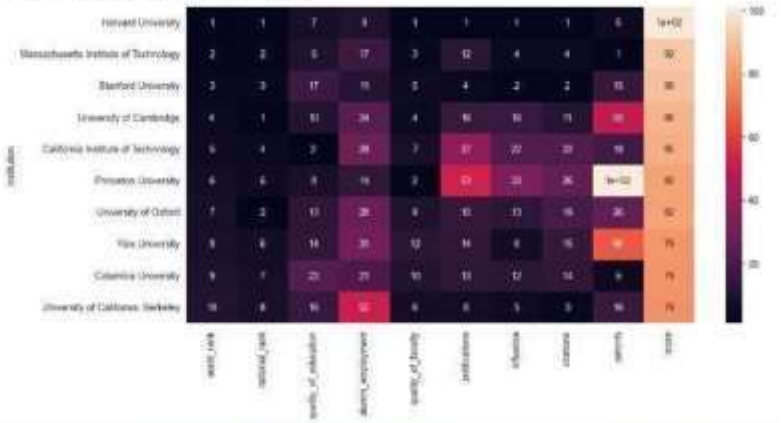
Section	Description
Data Overview	

```
car.describe(include = "All")
```

	world_rank	institution	country	national_rank	quality_of_education	alumni_employment	quality_of_faculty	publications	in
count	2200.000000	2200.000000	2200.000000	2200.000000	2200.000000	2200.000000	2200.000000	2200.000000	2200
mean	459.390909	516.280909	34.110455	34.161818	275.100455	357.116818	189.660000	459.938636	459
std	304.320383	294.908607	19.211020	25.642332	121.925100	166.779252	41.673073	303.750353	303
min	1.000000	0.000000	0.000000	1.000000	1.000000	1.000000	112.375000	1.000000	1
25%	175.750000	261.750000	17.000000	6.000000	175.750000	175.750000	175.750000	175.750000	175
50%	450.500000	521.000000	33.000000	21.000000	355.000000	450.500000	210.000000	450.500000	450
75%	725.250000	770.250000	54.000000	49.000000	367.000000	476.000000	218.000000	725.000000	725
max	1000.000000	1023.000000	58.000000	113.000000	367.000000	567.000000	218.000000	1000.000000	991

Univariate Analysis	*a.Univariate Analysis* 

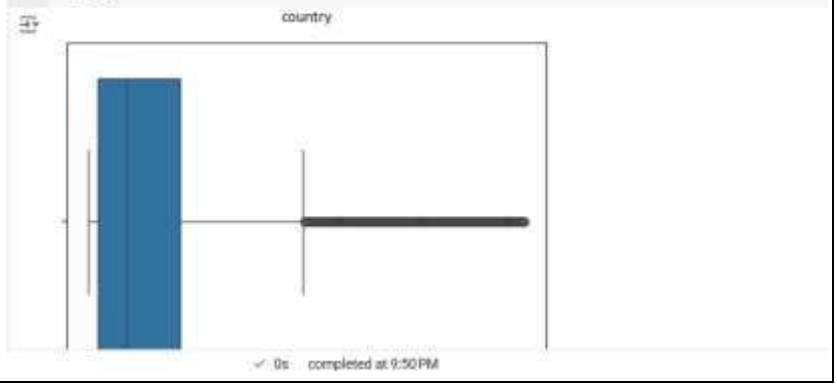
Bivariate Analysis	

Multivariate Analysis	*c. Multivariate Analysis*
	`top1= cwur.head(10)`
	`#top1.info()`
	`top1_f = top1.loc[:,['world_rank','national_rank','quality_of_education','alumni_employment','quality_of_faculty','publications','influence','citations','patents','score']]`
	`plt.figure(figsize=(12,8))`
	`sns.heatmap(data=top1_f, annot=True)`
	`plt.show`
	<function matplotlib.pyplot.show(close=None, block=None)>
	 

Data Preprocessing Code Screenshots	

Loading Data	`cwur = pd.read_csv("/content/cwurData.csv")`
	`cwur.head()`
	world_rank, institution, country, national_rank, quality_of_education, alumni_employment, quality_of_faculty, publications, influence
	0, 1, Harvard University, USA, 1, 7, 9, 1, 7, 1
	1, 2, Massachusetts Institute of Technology, USA, 2, 9, 17, 3, 12, 4
	2, 3, Stanford University, USA, 3, 17, 11, 5, 4, 2
	3, 4, University of Cambridge, United Kingdom, 1, 10, 24, 4, 16, 16
	4, 5, California Institute of Technology, USA, 4, 2, 29, 7, 37, 22

Handling Null Values	Handling null Values `np.sum(cwur.isnull())` world_rank 0 institution 0 country 0 national_rank 0 quality_of_education 0 alumni_employment 0 quality_of_faculty 0 publications 0 influence 0 citations 0 broad_impact 0 patents 0 score 0 year 0 dtype: int64

Viewing outliers	Handling outliers
	
	`def fun(col):`
	`  sns.boxplot(x=col,data=cwur)`
	`  plt.show()`
	
	`for i in cwur.columns:`
	`  fun(i)`
	
	 
	
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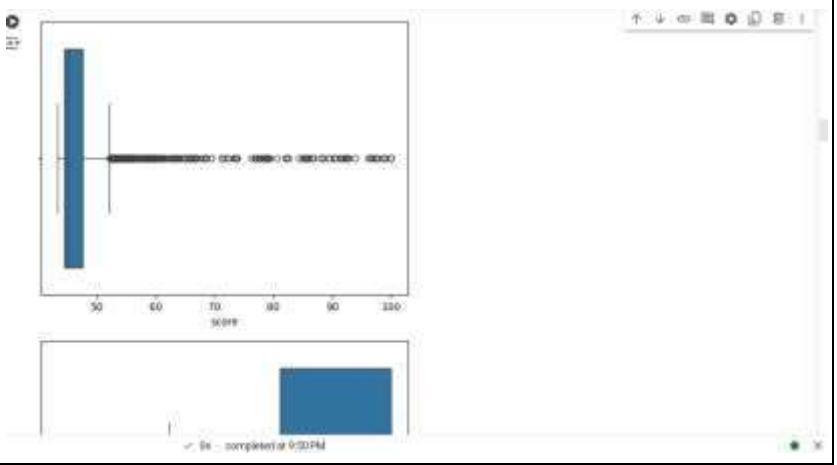
<td>  </td>
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<td>Handling outliers</td>
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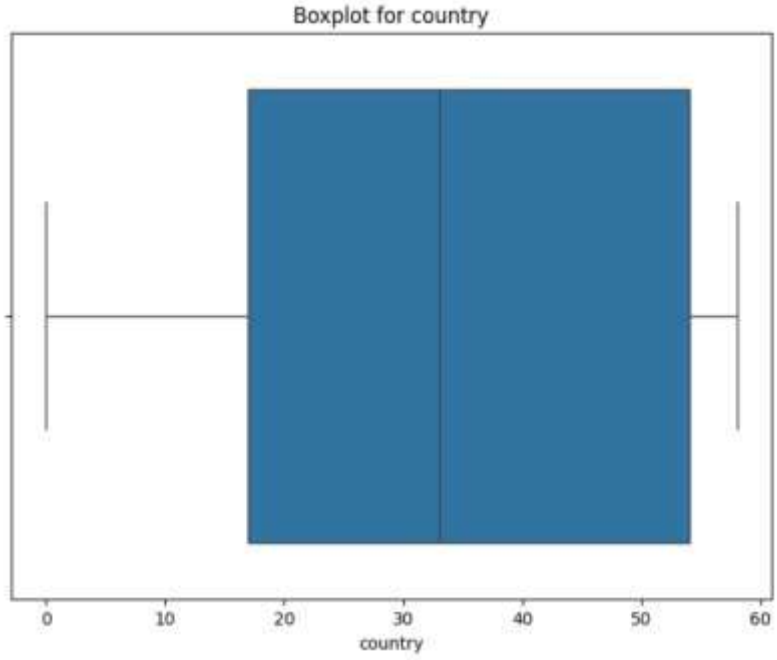
```
# Iterate over each column and plot boxplot
for column in cwur.columns:
    plt.figure(figsize=(8, 6))  # Adjust the figure size as needed
    sns.boxplot(x=cwur[column])
    plt.title(f'Boxplot for {column}')
    plt.xlabel(column)
    plt.show()
```



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	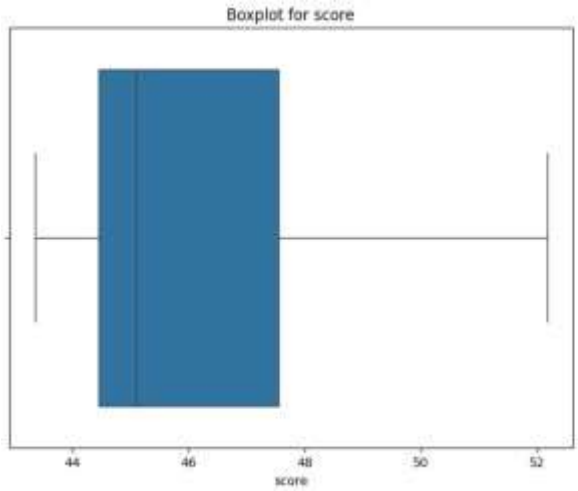
Saved Processed Data