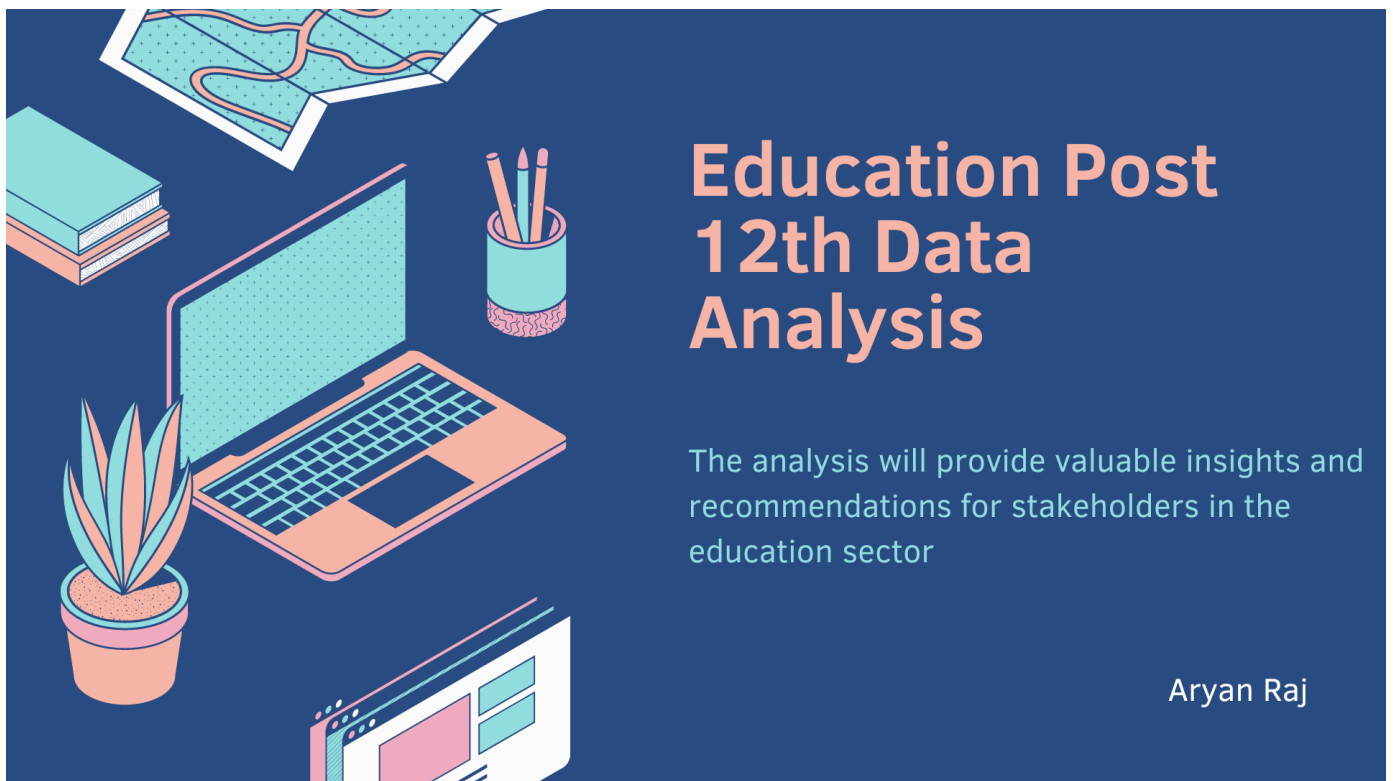


## ✓ Education Post 12th Report



### Data

The objective of this analysis is to gain insights into the characteristics of colleges and answer key questions related to the educational landscape. By understanding the data, we aim to inform strategies for improving the quality of education and enhancing the overall college experience. The analysis will provide valuable insights and recommendations for stakeholders in the education sector. **##Data Description**

- **Names:** Names of various university and colleges
- **Apps:** Number of applications received
- **Accept:** Number of applications accepted
- **Enroll:** Number of new students enrolled
- **Top10perc:** Percentage of new students from top 10% of Higher Secondary class
- **Top25perc:** Percentage of new students from top 25% of Higher Secondary class
- **F.Undergrad:** Number of full-time undergraduate students
- **P.Undergrad:** Number of part-time undergraduate students
- **Outstate:** Number of students for whom the particular college or university is Out-of-state tuition
- **Room.Board:** Cost of Room and board
- **Books:** Estimated book costs for a student
- **Personal:** Estimated personal spending for a student
- **PhD:** Percentage of faculties with Ph.D.'s
- **Terminal:** Percentage of faculties with terminal degree
- **S.F.Ratio:** Student/faculty ratio
- **perc.alumni:** Percentage of alumni who donate
- **Expend:** The Instructional expenditure per student
- **Grad.Rate:** Graduation rate

## ✓ Basic Steps:

## 1- Display the top 5 rows

Start coding or [generate](#) with AI.

```
↩
      Names      Apps  Accept  Enroll  Top10perc  Top25perc  \
0  Abilene Christian University  1660.0    1232    721.0      23.0      52
1      Adelphi University    2186.0    1924    512.0      16.0      29
2      Adrian College    1428.0    1097    336.0      22.0      50
3      Agnes Scott College    417.0     349     NaN      60.0      89
4  Alaska Pacific University    193.0     146    55.0      16.0      44

      F.Undergrad  P.Undergrad  Outstate  Room.Board  Books  Personal  PhD  \
0           2885           537      7440        3300    450    2200.0    70
1           2683          1227      12280        6450    750    1500.0    29
2           1036           99      11250        3750    400    1165.0    53
3            510           63      12960        5450    450     875.0    92
4            249          869      7560        4120    800    1500.0    76

      Terminal  S.F.Ratio  perc.alumni  Expend  Grad.Rate
0           78        18.1          12    7041         60
1           30          ?          16   10527         56
2           66        12.9          30    8735         54
3           97         7.7          37   19016         59
4           72        11.9           2   10922         15
```

## 2- Display the last 5 rows

Start coding or [generate](#) with AI.

```
↩
      Names      Apps  Accept  Enroll  Top10perc  \
772  Worcester State College    2197.0    1515    543.0      4.0
773  Xavier University    1959.0    1805    695.0     24.0
774  Xavier University of Louisiana    2097.0    1915    695.0     34.0
775  Yale University    10705.0    2453    1317.0     95.0
776  York College of Pennsylvania    2989.0    1855    691.0     28.0

      Top25perc  F.Undergrad  P.Undergrad  Outstate  Room.Board  Books  \
772           26          3089          2029      6797        3900    500
773           47          2849          1107     11520        4960    600
774           61          2793           166      6900        4200    617
775           99          5217           83     19840        6510    630
776           63          2988          1726      4990        3560    500

      Personal  PhD  Terminal  S.F.Ratio  perc.alumni  Expend  Grad.Rate
772    1200.0    60         60         21          14    4469         40
773    1250.0    73         75        13.3          31    9189         83
774     781.0    67         75        14.4          20    8323         49
775    2115.0    96         96         5.8          49   40386         99
776    1250.0    75         75        18.1          28    4509         99
```

## 3- Check the shape of dataset.

Start coding or [generate](#) with AI.

```
↩ The dataset has 777 rows and 18 columns.
```

## 4- Check the datatypes of each feature.

Start coding or [generate](#) with AI.

```
↩
Names      object
Apps       float64
Accept     int64
Enroll     float64
Top10perc  float64
Top25perc  int64
F.Undergrad  int64
```

```

P.Undergrad      int64
Outstate         int64
Room.Board       int64
Books            int64
Personal         float64
PhD              int64
Terminal         int64
S.F.Ratio        object
perc.alumni      int64
Expend           int64
Grad.Rate        int64
dtype: object

```

## 5- Check the Statistical summary

Start coding or [generate](#) with AI.

```

↩ count      Apps      Accept      Enroll      Top10perc      Top25perc  \
mean      775.000000    777.000000    775.000000    773.000000    777.000000
std      3007.592258    2018.804376    780.961290    27.620957    55.796654
min      3873.414660    2451.113971    930.077779    17.645470    19.804778
25%      81.000000     72.000000     35.000000     1.000000     9.000000
50%      778.000000     604.000000    242.500000    15.000000    41.000000
75%      1561.000000    1110.000000    434.000000    23.000000    54.000000
max      3635.000000    2424.000000    902.500000    35.000000    69.000000

count      F.Undergrad      P.Undergrad      Outstate      Room.Board      Books  \
mean      48094.000000    26330.000000    6392.000000    96.000000    100.000000
std      48094.000000    26330.000000    6392.000000    96.000000    100.000000
min      139.000000     1.000000     2340.000000    1780.000000     0.000000
25%      992.000000     95.000000     7320.000000    3597.000000    465.000000
50%      1707.000000     353.000000    9990.000000    4200.000000    500.000000
75%      4005.000000     967.000000   12925.000000    5050.000000    600.000000
max      31643.000000    21836.000000    21700.000000    8124.000000    2340.000000

count      Personal      PhD      Terminal      perc.alumni      Expend  \
mean      1601.507752    72.660232    79.702703    22.743887    9660.171171
std      7369.594038    16.328155    14.722359    12.391801    5221.768440
min      50.000000     8.000000     24.000000     0.000000    3186.000000
25%      855.000000    62.000000    71.000000    13.000000    6751.000000
50%      1200.000000    75.000000    82.000000    21.000000    8377.000000
75%      1687.500000    85.000000    92.000000    31.000000   10830.000000
max      205500.000000    103.000000   100.000000    64.000000   56233.000000

count      Grad.Rate
mean      65.46332
std      17.17771
min      10.00000
25%      53.00000
50%      65.00000
75%      78.00000
max      118.00000

```

## 6- Check the null values

Start coding or [generate](#) with AI.

```

↩ Names      0
Apps         2
Accept       0
Enroll       2
Top10perc    4
Top25perc    0
F.Undergrad  0
P.Undergrad  0
Outstate     0
Room.Board   0
Books        0
Personal     3

```

```

PhD          0
Terminal     0
S.F.Ratio    0
perc.alumni  0
Expend       0
Grad.Rate    0
dtype: int64

```

## 7- Check the duplicate values

Start coding or [generate](#) with AI.

There are 0 duplicate rows in the dataset.

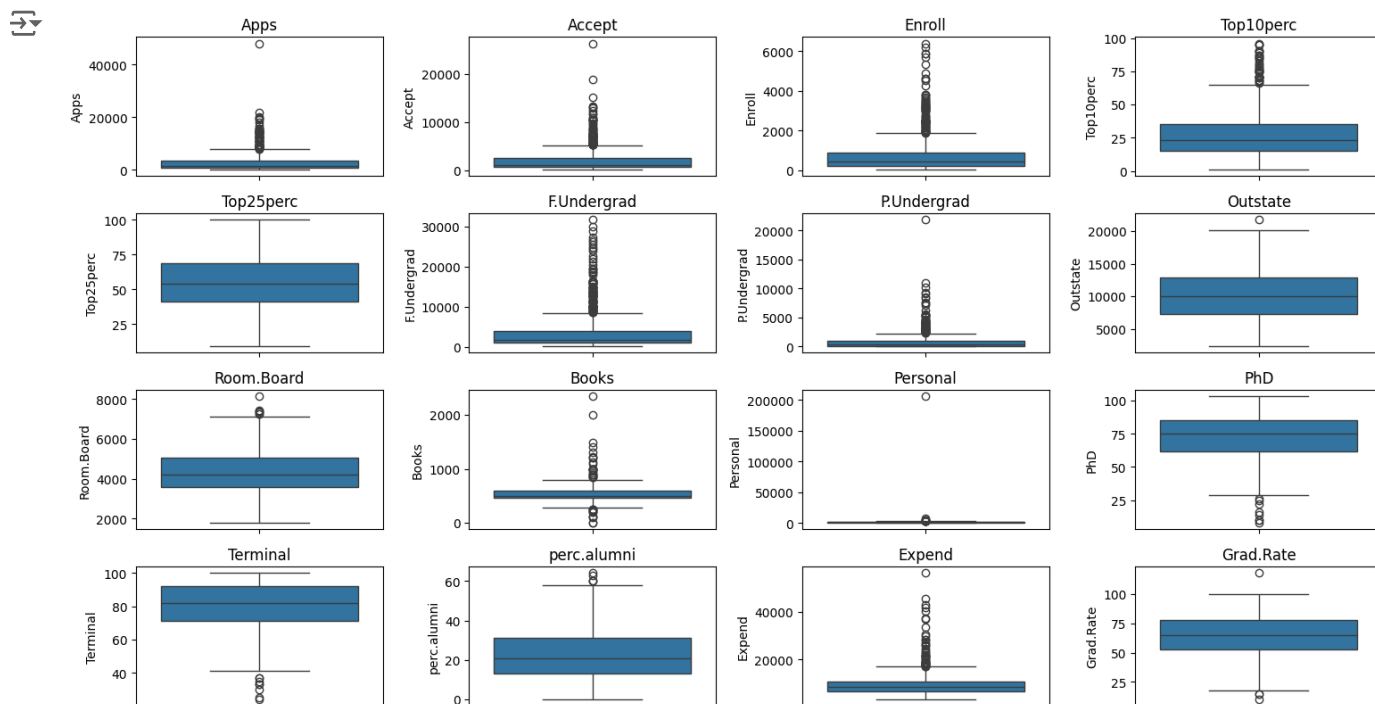
## 8- Check the anomalies or wrong entries.

Start coding or [generate](#) with AI.

Anomalies or wrong entries:  
Empty DataFrame  
Columns: [Names, Apps, Accept, Enroll, Top10perc, Top25perc, F.Undergrad, P.Undergrad, Outstate, Room.Board, Books  
Index: []

## 9- Check the outliers and their authenticity.

Start coding or [generate](#) with AI.



## 10- Do the necessary data cleaning steps like dropping duplicates, unnecessary columns, null value imputation, outliers treatment etc.

Start coding or [generate](#) with AI.

Dropped 0 duplicate rows.

Handled null values.

Outliers treated.

Cleaned data summary:

	Apps	Accept	Enroll	Top10perc	Top25perc	\
count	777.000000	777.000000	777.000000	777.000000	777.000000	
mean	2576.766003	1746.280566	661.224482	26.905385	55.796654	
std	2419.218704	1523.286632	569.519476	15.539631	19.804778	
min	81.000000	72.000000	35.000000	1.000000	9.000000	
25%	780.000000	604.000000	243.000000	15.000000	41.000000	
50%	1563.000000	1110.000000	437.000000	23.000000	54.000000	
75%	3624.000000	2424.000000	902.000000	35.000000	69.000000	
max	7890.000000	5154.000000	1890.500000	65.000000	100.000000	

	F.Undergrad	P.Undergrad	Outstate	Room.Board	Books	\
count	777.000000	777.000000	777.000000	777.000000	777.000000	
mean	2935.648005	655.884170	10440.196268	4355.438224	538.747104	
std	2700.233049	716.274014	4021.712447	1090.666009	117.124909	
min	139.000000	1.000000	2340.000000	1780.000000	262.500000	
25%	992.000000	95.000000	7320.000000	3597.000000	465.000000	
50%	1707.000000	353.000000	9990.000000	4200.000000	500.000000	
75%	4005.000000	967.000000	12925.000000	5050.000000	600.000000	
max	8524.500000	2275.000000	21332.500000	7229.500000	802.500000	

	Personal	PhD	Terminal	perc.alumni	Expend	\
count	777.000000	777.000000	777.000000	777.000000	777.000000	
mean	1321.615860	72.774775	79.782497	22.722008	9182.523810	
std	604.331581	15.953120	14.473057	12.325480	3396.496148	
min	50.000000	27.500000	39.500000	0.000000	3186.000000	
25%	870.000000	62.000000	71.000000	13.000000	6751.000000	
50%	1200.000000	75.000000	82.000000	21.000000	8377.000000	
75%	1680.000000	85.000000	92.000000	31.000000	10830.000000	
max	2895.000000	103.000000	100.000000	58.000000	16948.500000	

	Grad.Rate
count	777.000000
mean	65.468468
std	17.142538
min	15.500000
25%	53.000000
50%	65.000000
75%	78.000000
max	115.500000

## ✓ 1. Application and Enrollment Analysis

- ✓ What is the average number of applications received by colleges?

Start coding or [generate](#) with AI.

➡ Average number of applications received by colleges: 2576.77

### Output

- ✓ What percentage of applications are accepted on average across all colleges?

Start coding or [generate](#) with AI.

➡ Average percentage of applications accepted: 67.77%

- ✓ What is the average enrollment rate (number of students enrolled divided by number of applications accepted)?

Start coding or [generate](#) with AI.

→ Average enrollment rate: 37.86%

- ∨ Which college has the highest number of applications received?

Start coding or [generate](#) with AI.

→ College with the highest number of applications received: Arizona State University Main campus (7890.0 application



## ∨ 2. Academic Excellence

- ∨ What is the average percentage of new students from the top 10% of their higher secondary class across all colleges?

Start coding or [generate](#) with AI.

→ Average percentage of new students from the top 10% of their higher secondary class: 26.91%

- ∨ What is the average percentage of new students from the top 25% of their higher secondary class?

Start coding or [generate](#) with AI.

→ Average percentage of new students from the top 25% of their higher secondary class: 55.80%

- ∨ Is there a correlation between the percentage of students from the top 10% and the top 25% of their higher secondary class?

Start coding or [generate](#) with AI.

→ Correlation between top 10% and top 25% of their higher secondary class: 0.91

## ∨ 3. Student Demographics

- ∨ What is the average number of full-time undergraduate students per college?

Start coding or [generate](#) with AI.

→ Average number of full-time undergraduate students per college: 2935.65

- ∨ What is the average number of part-time undergraduate students per college?

Start coding or [generate](#) with AI.

→ Average number of part-time undergraduate students per college: 655.88

- ▾ Which college has the highest number of out-of-state students?

Start coding or [generate](#) with AI.

➦ College with the highest number of out-of-state students: Bennington College (21332.5 students)

## ▾ 4. Cost and Spending

- ▾ What is the average cost of room and board across all colleges?

Start coding or [generate](#) with AI.

➦ Average cost of room and board across all colleges: 4355.44

- ▾ What is the average estimated book cost for a student?

Start coding or [generate](#) with AI.

➦ Average estimated book cost for a student: 538.75

- ▾ What is the average estimated personal spending for a student?

Start coding or [generate](#) with AI.

➦ Average estimated personal spending for a student: 1321.62

- ▾ How does the instructional expenditure per student vary across colleges?

Start coding or [generate](#) with AI.

➦ Instructional expenditure per student across colleges:

count	777.000000
mean	9182.523810
std	3396.496148
min	3186.000000
25%	6751.000000
50%	8377.000000
75%	10830.000000
max	16948.500000
Name: Expend, dtype: float64	

## ▾ 5. Faculty Qualifications

- ▾ What is the average percentage of faculties with Ph.D.s across all colleges?

Start coding or [generate](#) with AI.

➦ Average percentage of faculties with Ph.D.s across all colleges: 72.77%

- ▾ What is the average percentage of faculties with terminal degrees?

Start coding or [generate](#) with AI.

➞ Average percentage of faculties with terminal degrees: 79.78%

- ▾ Is there a correlation between the percentage of faculties with Ph.D.s and the graduation rate?

Start coding or [generate](#) with AI.

➞ Correlation between the percentage of faculties with Ph.D.s and the graduation rate: 0.31

## ▾ 6. Student-Faculty Interaction

- ▾ What is the average student/faculty ratio across all colleges?

Start coding or [generate](#) with AI.

➞ Unique values in 'S.F.Ratio' column:  
['18.1' '12.9' '7.7' '11.9' '9.4' '11.5' '13.7' '11.3' '9.9' '13.3' '15.3' '11.1' '14.7' '8.4' '12.1' '23.1' '18.3' '12.7' '18.9' '12.6' '19.6' '13.8' '16.7' '12.8' '10.4' '13' '22.4' '11' '17.6' '9.7' '10.3' '18.5' '12.2' '13.1' '13.2' '14.1' '10.1' '17.5' '16.3' '11.6' '8.8' '11.7' '14' '14.3' '18' '17.8' '11.2' '21.1' '10.2' '14.4' '9.8' '20.5' '7.6' '12.3' '14.2' '10.9' '16.5' '13.9' '12.4' '19.8' '21.2' '14.8' '17.7' '14.6' '9.2' '13.6' '15.9' '2.9' '13.5' '9.3' '9.5' '6.8' '19.7' '15.2' '11.4' '8.3' '16.9' '9.6' '10.5' '15.8' '17.2' '19.2' '5.9' '10.7' '6.5' '22.2' '4.7' '12' '17.1' '15.1' '12.5' '15' '5' '10.6' '15.7' '16.2' '17.3' '21.5' '19.3' '17.4' '19.1' '14.9' '16.1' '20.1' '7.2' '19' '27.6' '23.6' '20.6' '18.4' '15.6' '8.2' '11.8' '22' '21' '16.6' '21.3' '39.8' '16' '17.9' '17' '14.5' '3.3' '27.8' '20.8' '24.1' '20' '6.2' '10.8' '16.8' '28.8' '15.4' '20.3' '16.4' '18.6' '9' '20.2' '13.4' '7.8' '21.7' '20.4' '19.4' '18.2' '22.1' '19.5' '27.2' '4.6' '18.8' '10' '6.1' '8.9' '19.9' '18.7' '15.5' '9.1' '21.9' '6.7' '2.5' '5.3' '22.6' '6.3' '25.3' '7.5' '23.4' '5.8' '8.7' '22.9' '4.3' '3.9' '24.7' '22.7' '8.5']

Rows with NaN in 'S.F.Ratio' after conversion:

	Names	Apps	Accept	Enroll	Top10perc	Top25perc	\
1	Adelphi University	2186.0	1924	512.00000	16.0	29	
81	Campbell University	2087.0	1339	780.96129	20.0	54	
241	Gwynedd Mercy College	380.0	237	104.00000	30.0	56	

	F.Undergrad	P.Undergrad	Outstate	Room.Board	Books	Personal	PhD	\
1	2683.0	1227	12280.0	6450.0	750.0	1500.0	29.0	
81	3191.0	1204	7550.0	2790.0	600.0	500.0	77.0	
241	716.0	1108	11000.0	5550.0	500.0	500.0	36.0	

	Terminal	S.F.Ratio	perc.alumni	Expend	Grad.Rate
1	39.5	NaN	16	10527.0	56.0
81	77.0	NaN	34	3739.0	63.0
241	41.0	NaN	22	7483.0	96.0

Average student/faculty ratio across all colleges: 14.09

- ▾ Which college has the lowest student/faculty ratio?

Start coding or [generate](#) with AI.

➞ College with the lowest student/faculty ratio: University of Charleston (2.50)

- ▾ Is there a correlation between the student/faculty ratio and the graduation rate?

Start coding or [generate](#) with AI.

➞ Correlation between the student/faculty ratio and the graduation rate: -0.30



## ✓ 7. Alumni Engagement

- ✓ What is the average percentage of alumni who donate across all colleges?

Start coding or [generate](#) with AI.

➦ Average percentage of alumni who donate across all colleges: 22.72%

- ✓ Is there a correlation between the percentage of alumni who donate and the graduation rate?

Start coding or [generate](#) with AI.

➦ Correlation between the percentage of alumni who donate and the graduation rate: 0.49

## ✓ 8. Graduation Rates

- ✓ What is the average graduation rate across all colleges?

Start coding or [generate](#) with AI.

➦ Average graduation rate across all colleges: 65.47%

- ✓ Which college has the highest graduation rate?

Start coding or [generate](#) with AI.

➦ College with the highest graduation rate: Cazenovia College (115.50%)

- ✓ Is there a correlation between the instructional expenditure per student and the graduation rate?

Start coding or [generate](#) with AI.

➦ Correlation between the instructional expenditure per student and the graduation rate: 0.42

## ✓ 9. Overall Insights

- ✓ Which factors (applications, acceptance rate, enrollment, academic excellence, costs, faculty qualifications, student/faculty ratio, alumni donations, expenditures) are most strongly associated with higher graduation rates?

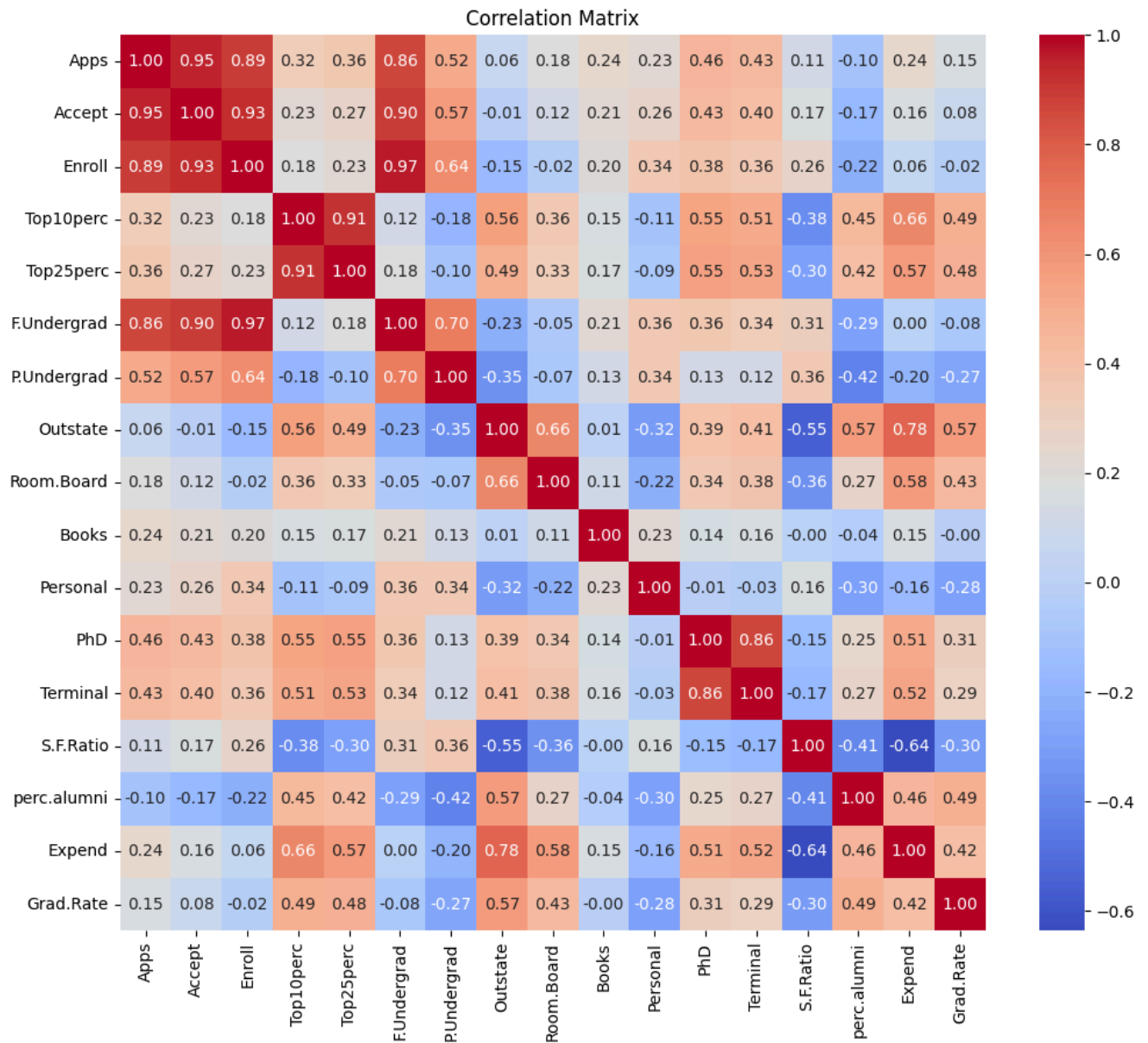
Start coding or [generate](#) with AI.

Factors most strongly associated with higher graduation rates:

```

Grad.Rate      1.000000
Outstate      0.572458
perc.alumni   0.491408
Top10perc     0.489846
Top25perc     0.478985
Room.Board    0.425790
Expend        0.415291
PhD           0.310019
Terminal      0.292803
Apps          0.151167
Accept        0.078982
Books         -0.003957
Enroll        -0.023807
F.Undergrad   -0.082239
P.Undergrad   -0.265158
Personal      -0.284135
S.F.Ratio     -0.304588
Name: Grad.Rate, dtype: float64

```



- What recommendations can be made to colleges to improve their graduation rates based on the data analysis?

⇒ Factors most strongly associated with higher graduation rates:

Grad.Rate	1.000000
Outstate	0.572458
perc.alumni	0.491408
Top10perc	0.489846
Top25perc	0.478985
Room.Board	0.425790
Expend	0.415291
PhD	0.310019
Terminal	0.292803
Apps	0.151167
Accept	0.078982
Books	-0.003957
Enroll	-0.023807
F.Undergrad	-0.082239
P.Undergrad	-0.265158
Personal	-0.284135
S.F.Ratio	-0.304588

Name: Grad.Rate, dtype: float64