In [2]:
```
import pandas as pd
import numpy  as np
import matplotlib.pyplot as plt
import seaborn as sns
import dash
import dash_core_components as dcc
import dash_html_components as html
import pandas as pd
import plotly.express as px
```

```
C:\Users\Lenovo\AppData\Local\Temp\ipykernel_15484\2032138902.py:6: UserWarning:
The dash_core_components package is deprecated. Please replace
`import dash_core_components as dcc` with `from dash import dcc`
  import dash_core_components as dcc
C:\Users\Lenovo\AppData\Local\Temp\ipykernel_15484\2032138902.py:7: UserWarning:
The dash_html_components package is deprecated. Please replace
`import dash_html_components as html` with `from dash import html`
  import dash_html_components as html
```

In [4]:
```
#load the dataset
india_colleges=pd.read_csv(r'C:\Users\Lenovo\Downloads\engineering colleges in I
india_colleges
```

Out[4]:

	College Name	Genders Accepted	Campus Size	Total Student Enrollments	Total Faculty	Established Year	Rating	Uni
0	National Institute of Technology Rourkela	Co-Ed	647 Acres	4811	329	2007	3.12	
1	Visvesvaraya National Institute of Technology ...	Co-Ed	215 Acres	1071	192	2007	NaN	
2	Netaji Subhas University of Technology	Co-Ed	145 Acres	3759	101	2018	NaN	
3	Birla Institute of Technology	Co-Ed	980 Acres	4506	284	1955	NaN	
4	International Institute of Information Technology	Co-Ed	66 Acres	1721	85	2001	3.05	
...	...	...	...	...	...	...	...	
5441	BES Institute of Technology	Co-Ed	4 Acres	NaN	31	2003	NaN	
5442	Radical Polytechnic College	Co-Ed	NaN	NaN	NaN	2013	NaN	
5443	Trimurti Institute of Technology Polytechnic	Co-Ed	NaN	22	55	2009	NaN	
5444	RV Parankar College of Engineering and Technology	Co-Ed	NaN	38	10	2015	NaN	Rash T N Univ
5445	Centre for Design	Co-Ed	NaN	NaN	20	NaN	NaN	Viveka

	College Name	Genders Accepted	Campus Size	Total Student Enrollments	Total Faculty	Established Year	Rating	Uni
	Excellence							Uni

5446 rows × 15 columns

In [6]:
```
#it is used to describe the dataset
india_colleges.describe
```

Out[6]: <bound method NDFrame.describe of Co

```
llege Name Genders Accepted  \
0            National Institute of Technology Rourkela            Co-Ed
1     Visvesvaraya National Institute of Technology ...           Co-Ed
2                Netaji Subhas University of Technology           Co-Ed
3                         Birla Institute of Technology           Co-Ed
4     International Institute of Information Technology           Co-Ed
...                                                  ...            ...
5441                       BES Institute of Technology           Co-Ed
5442                       Radical Polytechnic College           Co-Ed
5443       Trimurti Institute of Technology Polytechnic           Co-Ed
5444  RV Parankar College of Engineering and Technology           Co-Ed
5445                      Centre for Design Excellence           Co-Ed

     Campus Size Total Student Enrollments Total Faculty Established Year  \
0      647 Acres                      4811          329             2007
1      215 Acres                      1071          192             2007
2      145 Acres                      3759          101             2018
3      980 Acres                      4506          284             1955
4       66 Acres                      1721           85             2001
...          ...                       ...          ...              ...
5441     4 Acres                      NaN           31             2003
5442         NaN                      NaN          NaN             2013
5443         NaN                       22           55             2009
5444         NaN                       38           10             2015
5445         NaN                      NaN           20              NaN

     Rating                                          University  \
0      3.12                                                 NaN
1       NaN                                                 NaN
2       NaN                                                 NaN
3       NaN                                                 NaN
4      3.05                                                 NaN
...     ...                                                 ...
5441    NaN                                                 NaN
5442    NaN                                                 NaN
5443    NaN                                                 NaN
5444    NaN  Rashtrasant Tukadoji Maharaj Nagpur University...
5445    NaN              Vivekananda Global University, Jaipur

                                              Courses  \
0     B.Tech Mechanical Engineering, B.Tech Computer...
1     B.Tech Computer Science Engineering, B.Tech El...
2     B.Tech Computer Engineering, B.Tech Electronic...
3     B.Tech Computer Science Engineering, B.Tech El...
4     B.Tech Computer Science and Engineering, M.Tec...
...                                                 ...
5441  Diploma in Civil Engineering, Diploma in Compu...
5442  Diploma in Civil Engineering, Diploma in Mecha...
5443  Diploma in Electrical Engineering, Diploma in ...
5444  BE Civil Engineering, BE Electrical Engineerin...
5445  B.Arch, B.Des Fashion and Textile Design, B.De...

                                          Facilities       City  \
0     Boys Hostel, Girls Hostel, Gym, Library, Sport...   Rourkela
1     Boys Hostel, Girls Hostel, Gym, Library, Sport...      Nagpur
2     Boys Hostel, Girls Hostel, Gym, Library, Sport...  New Delhi
3     Boys Hostel, Girls Hostel, Gym, Library, Sport...      Ranchi
4     Boys Hostel, Girls Hostel, Gym, Library, Sport...  Hyderabad
...                                                 ...         ...
```

```
5441  Girls Hostel, Library, Sports, Cafeteria, Audi...  Bengaluru
5442  Boys Hostel, Girls Hostel, Library, Sports, Wi...   Amritsar
5443   Library, Sports, IT Infrastructure, Laboratories     Paldhi
5444  Library, Sports, Cafeteria, Auditorium, IT Inf...       Arvi
5445  Boys Hostel, Girls Hostel, Library, Sports, Au...     Jaipur

            State Country       College Type       Average Fees
0          Odisha   India  Public/Government           350600.0
1     Maharashtra   India  Public/Government  273596.6666666667
2           Delhi   India  Public/Government           352320.0
3       Jharkhand   India            Private  596686.0465116279
4       Telangana   India            Private  756666.6666666666
...           ...     ...                ...                ...
5441    Karnataka   India            Private            38490.0
5442       Punjab   India            Private            75100.0
5443  Maharashtra   India            Private           157000.0
5444  Maharashtra   India            Private           272000.0
5445    Rajasthan   India            Private           897500.0

[5446 rows x 15 columns]>
```

In [8]:
```
india_colleges.describe()#this is used to give yhe five no summary of the datase
```

Out[8]:

	College Name	Genders Accepted	Campus Size	Total Student Enrollments	Total Faculty	Established Year	Rating	Uni
count	5446	5428	2695	4443	5285	5345	333	
unique	4831	5	255	2208	420	111	110	
top	Government Polytechnic	Co-Ed	10 Acres	633	60	2008	3.08	Uni C
freq	154	5243	237	9	63	683	13	

In [10]:
```
#it is used to give the column of the dataset
india_colleges.columns#displat the number of columns
```

Out[10]:
```
Index(['College Name', 'Genders Accepted', 'Campus Size',
       'Total Student Enrollments', 'Total Faculty', 'Established Year',
       'Rating', 'University', 'Courses', 'Facilities', 'City', 'State',
       'Country', 'College Type', 'Average Fees'],
      dtype='object')
```

In [ ]:
```

```

In [12]:
```
#it is used to give the no of rows
india_colleges.index#display the no of rows
```

Out[12]:
```
RangeIndex(start=0, stop=5446, step=1)
```

In [14]:
```
india_colleges['College Name'].value_counts().head(20)#display the  no. of colle
```

Out[14]:
```
College Name
Government Polytechnic                                          154
Government Polytechnic College                                   62
Government Engineering College                                   35
College of Engineering                                           22
Government College of Engineering                                15
Indian Institute of Information Technology                       15
Central Institute of Plastics Engineering and Technology         14
University College of Engineering                                11
Institute of Engineering and Technology                           9
Government Girls Polytechnic                                      9
College of Engineering and Technology                             6
Guru Nanak Institute of Technology                                6
Amity University                                                  6
Institute of Technology and Management                            6
Rajkiya Engineering College                                       6
ICFAI University                                                  6
College Name                                                      6
National Institute of Electronics and Information Technology      5
Government Women's Polytechnic College                            5
Vindhya Institute of Technology and Science                       5
Name: count, dtype: int64
```

In [16]:
```
# Filter the DataFrame for colleges with 'Indian Institute of Information Techno
iiit_colleges = india_colleges[india_colleges['College Name'].str.contains('Indi
# Get the names of these colleges
iiit_names = iiit_colleges['College Name']
# Display the names
print(iiit_names.head(20))
```

```
30     Indian Institute of Information Technology All...
57     Atal Bihari Vajpayee Indian Institute of Infor...
99     Indian Institute of Information Technology Des...
106    Indian Institute of Information Technology Des...
212           Indian Institute of Information Technology
259    Indian Institute of Information Technology Tir...
278           Indian Institute of Information Technology
325           Indian Institute of Information Technology
346    Indian Institute of Information Technology Dha...
349           Indian Institute of Information Technology
353    Indian Institute of Information Technology Kal...
376           Indian Institute of Information Technology
396    Indian Institute of Information Technology Des...
417           Indian Institute of Information Technology
421           Indian Institute of Information Technology
432           Indian Institute of Information Technology
504           Indian Institute of Information Technology
557           Indian Institute of Information Technology
567           Indian Institute of Information Technology
606           Indian Institute of Information Technology
Name: College Name, dtype: object
```

In [62]:
```
amity_University = india_colleges[india_colleges['College Name'].str.contains('A
# Get the names of these colleges
amity_names = amity_University['College Name']
# Display the names
print(amity_names)
```

```
516     Amity University
517     Amity University
738     Amity University
788     Amity University
1086    Amity University
1526    Amity University
Name: College Name, dtype: object
```

In [64]:
```
# Filter for colleges that contain 'College of Engineering'
engineering_colleges = india_colleges[india_colleges['College Name'].str.contain
# Get the names of these colleges
engineering_names = engineering_colleges['College Name']
# Display the names
print(engineering_names.head(20))
```

```
5                              BMS College of Engineering
26                             MIT College of Engineering
27                                 College of Engineering
32                     Thiagarajar College of Engineering
34                           JNTUH College of Engineering
41               Andhra University College of Engineering
42      Sri Sivasubramaniya Nadar College of Engineering
55                 Dayananda Sagar College of Engineering
73                         Sinhgad College of Engineering
74                     University College of Engineering
76                     Government College of Engineering
77     Bharati Vidyapeeth Deemed University College o...
89     Jawaharlal Nehru Technological University Coll...
90     Sri Venkateswara University College of Enginee...
94                               LD College of Engineering
95                     KJ Somaiya College of Engineering
104                                College of Engineering
115                       Vasavi College of Engineering
118      Galgotias College of Engineering and Technology
127       University Visvesvaraya College of Engineering
Name: College Name, dtype: object
```

In [45]:
```
size=india_colleges['Campus Size'].value_counts().max#
size
```

Out[45]:
```
<bound method Series.max of Campus Size
10 Acres     237
5 Acres      144
25 Acres     140
20 Acres     116
11 Acres      99
            ...
190 Acres      1
215 Acres      1
170 Acres      1
185 Acres      1
74 Acres       1
Name: count, Length: 255, dtype: int64>
```

In [49]:
```
# Filter the dataset for Amity University
amity_university = india_colleges[india_colleges['College Name'].str.contains('A
# Get the campus size for Amity University
amity_campus_size = amity_university[['College Name', 'Campus Size','State']]
# Display the result
print(amity_campus_size)
```

```
          College Name Campus Size           State
516   Amity University    40 Acres   Uttar Pradesh
517   Amity University   150 Acres       Rajasthan
738   Amity University   110 Acres         Haryana
788   Amity University   100 Acres  Madhya Pradesh
1086  Amity University  1000 Acres     West Bengal
1526  Amity University         NaN       Jharkhand
```

In [80]:
```
state_count = india_colleges['State'].value_counts()
print(state_count)#display the no of colleges  in each state
```

```
State
Tamil Nadu                    834
Maharashtra                   712
Uttar Pradesh                 502
Andhra Pradesh                386
Karnataka                     339
Telangana                     312
Haryana                       263
Madhya Pradesh                261
Gujarat                       241
Rajasthan                     239
Kerala                        233
Punjab                        227
Odisha                        190
West Bengal                   173
Uttarakhand                    98
Chhattisgarh                   79
Himachal Pradesh               65
Bihar                          52
Jharkhand                      47
Delhi                          39
Assam                          35
Puducherry                     24
Jammu and Kashmir              21
Goa                            13
Tripura                         9
Manipur                         8
Chandigarh                      8
Meghalaya                       8
Arunachal Pradesh               6
State                           6
Nagaland                        5
Mizoram                         5
Sikkim                          4
Andaman and Nicobar Islands     1
Dadra and Nagar Haveli          1
Name: count, dtype: int64
```

In [51]:
```
# Filter the dataset for colleges in Madhya Pradesh
mp_colleges = india_colleges[india_colleges['State'] == 'Madhya Pradesh']
# Display the names of the colleges
print(mp_colleges['College Name'].head(50))
```

```
29      Maulana Azad National Institute of Technology ...
40                Indian Institute of Technology Indore
57      Atal Bihari Vajpayee Indian Institute of Infor...
106     Indian Institute of Information Technology Des...
112     Shri Govindram Seksaria Institute of Technolog...
164                                       ITM University
187     Indian Institute of Science Education and Rese...
203                 Lakshmi Narain College of Technology
205     Institute of Engineering and Technology Devi A...
207                          Jabalpur Engineering College
262     University Institute of Technology Rajiv Gandh...
344                                    Jiwaji University
351             Rajiv Gandhi Proudyogiki Vishwavidyalaya
352           Madhav Institute of Technology and Science
465      Acropolis Institute of Technology and Research
473            Sagar Institute of Science and Technology
479           Sagar Institute of Research and Technology
481      Barkatullah University Institute of Technology
490                           Ujjain Engineering College
491        Oriental Institute of Science and Technology
500                 Institute of Engineering and Science
522                    Dr Harisingh Gour Vishwavidyalaya
534     Lakshmi Narain College of Technology and Science
543                  Sarvepalli Radhakrishnan University
555          School of Planning and Architecture Bhopal
579                  Technocrats Institute of Technology
589              Institute of Engineering and Technology
660     Shri Vaishnav Institute of Technology and Science
718           Indian Institute of Information Technology
757                                  Avantika University
777             Symbiosis University of Applied Sciences
788                                    Amity University
843                           Sagar Institute of Science
856                 Samrat Ashok Technological Institute
875     Sagar Institute of Science Technology and Engi...
877           Indore Institute of Science and Technology
893                           Swami Vivekanand University
907                              Rewa Engineering College
918                                      Vikram University
926                           Engineering College Nowgong
946                     Indira Gandhi Engineering College
949       Jaypee University of Engineering and Technology
1002                                     RKDF University
1125      Hitkarini College of Engineering and Technology
1174                    Rustamji Institute of Technology
1189                       Patel Institute of Technology
1194                          Acropolis Technical Campus
1214                                  Peoples University
1227    Mahatma Gandhi Chitrakoot Gramodaya Vishwavidy...
1230                                 Medi-Caps University
Name: College Name, dtype: object
```

In [53]:
```
# Filter the dataset for colleges in Maharashtra
maharashtra_colleges = india_colleges[india_colleges['State'] == 'Maharashtra']
# Display the relevant columns (like College Name, or other details you want)
print(maharashtra_colleges[['College Name']].head(50))  # Adjust column name as
```

	College Name
1	Visvesvaraya National Institute of Technology ...
6	Institute of Chemical Technology
21	Maharashtra Institute of Technology
23	Veermata Jijabai Technological Institute
26	MIT College of Engineering
45	Vishwakarma Institute of Technology
47	Savitribai Phule Pune University
51	Symbiosis International University
65	National Institute of Industrial Engineering
71	Dr DY Patil University
73	Sinhgad College of Engineering
76	Government College of Engineering
77	Bharati Vidyapeeth Deemed University College o...
85	University of Mumbai
91	Army Institute of Technology
95	KJ Somaiya College of Engineering
128	SCTR's Pune Institute of Computer Technology
133	Sardar Patel College of Engineering
137	Dr Vishwanath Karad MIT World Peace University
138	Sardar Patel Institute of Technology
140	Walchand College of Engineering
155	Shri Ramdeobaba College of Engineering and Man...
157	Shivaji University
179	MIT Academy of Engineering
209	Government College of Engineering
210	Vidyalankar Institute of Technology
213	Vishwakarma Institute of Information Technology
214	Dr DY Patil Institute of Technology
215	Rashtrasant Tukadoji Maharaj Nagpur University
221	Mukesh Patel School of Technology Management a...
236	GH Raisoni College of Engineering
237	AISSMS College of Engineering
258	Fr Conceicao Rodrigues College of Engineering
282	Government College of Engineering
285	Fr C Rodrigues Institute of Technology
287	Symbiosis Institute of Technology
297	Dr DY Patil Institute of Engineering and Techn...
299	Pune Vidyarthi Griha's College of Engineering ...
328	Dwarkadas J Sanghvi College of Engineering
333	Government College of Engineering and Research
335	DY Patil College of Engineering
339	Thakur College of Engineering and Technology
361	Pimpri Chinchwad College of Engineering
376	Indian Institute of Information Technology
379	Shri Sant Gajanan Maharaj College of Engineering
384	International Institute of Information Technology
387	MIT School of Engineering
403	Yeshwantrao Chavan College of Engineering
405	Dr Babasaheb Ambedkar Technological University
406	Don Bosco Institute of Technology

In [104…

```
# Filter the dataset for IITs
iit_colleges = india_colleges[india_colleges['College Name'].str.contains('IIT',
# Display the number of IITs and their locations
print("Number of IITs: {iit_colleges.shape[0]}")
print("IIT Locations:\n", iit_colleges[['College Name', 'State']].head(20))  # A
```

```
Number of IITs: {iit_colleges.shape[0]}
IIT Locations:
                                College Name            State
431                          NIIT University        Rajasthan
1297                        KIIT Polytechnic           Odisha
1936              KIIT College of Engineering          Haryana
3037              IITT College of Engineering  Himachal Pradesh
4005  VIIT College of Technology and Management    Uttar Pradesh
4193                   VIIT Polytechnic College    Uttar Pradesh
```

In [120…

```
courses=india_colleges['Courses'].value_counts().head(20)
courses
```

Out[120… Courses
B.Arch
53
Diploma in Civil Engineering, Diploma in Electrical Engineering, Diploma in Mechanical Engineering
33
BE Civil Engineering, BE Computer Science and Engineering, BE Electrical and Electronics Engineering, BE Electronics and Communication Engineering, BE Mechanical Engineering
28
B.Tech Civil Engineering, B.Tech Computer Science and Engineering, B.Tech Electrical and Electronics Engineering, B.Tech Electronics and Communication Engineering, B.Tech Mechanical Engineering
26
B.Tech Civil Engineering, B.Tech Computer Science and Engineering, B.Tech Electrical Engineering, B.Tech Electronics and Communication Engineering, B.Tech Mechanical Engineering
25
Diploma in Civil Engineering, Diploma in Computer Engineering, Diploma in Electrical Engineering, Diploma in Electronics and Communication Engineering, Diploma in Mechanical Engineering
14
Diploma in Mechanical Engineering, Diploma in Automobile Engineering, Diploma in Civil Engineering, Diploma in Electrical and Electronics Engineering, Diploma in Electronics and Communication Engineering
13
Diploma in Civil Engineering, Diploma in Computer Science and Engineering, Diploma in Electronics and Communication Engineering, Diploma in Mechanical Engineering
12
BE Mechanical Engineering, BE Civil Engineering, BE Computer Science and Engineering, BE Electrical and Electronics Engineering, BE Electronics and Communication Engineering
11
Diploma in Mechanical Engineering, Diploma in Civil Engineering, Diploma in Computer Engineering, Diploma in Electrical and Electronics Engineering, Diploma in Electronics and Communication Engineering
11
BE Civil Engineering, BE Computer Science and Engineering, BE Electronics and Communication Engineering, BE Mechanical Engineering
11
Diploma in Civil Engineering, Diploma in Computer Engineering, Diploma in Electrical and Electronics Engineering, Diploma in Electronics and Communication Engineering, Diploma in Mechanical Engineering
11
B.Arch, M.Arch
10
Diploma in Mechanical Engineering, Diploma in Automobile Engineering, Diploma in Civil Engineering, Diploma in Computer Engineering, Diploma in Electrical and Electronics Engineering, Diploma in Electronics and Communication Engineering
10
Diploma in Civil Engineering, Diploma in Electrical Engineering, Diploma in Electronics and Telecommunication Engineering, Diploma in Mechanical Engineering
9
Diploma in Mechanical Engineering, Diploma in Civil Engineering, Diploma in Electrical and Electronics Engineering, Diploma in Electronics and Communication Engineering
9
Diploma in Civil Engineering, Diploma in Computer Engineering, Diploma in Electrical Engineering, Diploma in Electronics and Telecommunication Engineering, Di

```
ploma in Mechanical Engineering
9
Diploma in Civil Engineering, Diploma in Computer Science and Engineering, Dipl
oma in Electrical Engineering, Diploma in Mechanical Engineering
8
Diploma in Mechanical Engineering, Diploma in Civil Engineering, Diploma in Com
puter Engineering, Diploma in Electronics and Telecommunication Engineering
8
B.Tech Civil Engineering, B.Tech Computer Science and Engineering, B.Tech Mecha
nical Engineering, B.Tech Electrical and Electronics Engineering, B.Tech Electr
onics and Communication Engineering
8
Name: count, dtype: int64
```

In [128…

```python
# Get the top 20 most common courses
courses = india_colleges['Courses'].value_counts().head(20)
# Display the top 20 courses
print("Top 20 Most Common Courses:\n")
for course, count in courses.items():
    print(f"{course}: {count} colleges")
```

```
Top 20 Most Common Courses:

B.Arch: 53 colleges
Diploma in Civil Engineering, Diploma in Electrical Engineering, Diploma in Mecha
nical Engineering: 33 colleges
BE Civil Engineering, BE Computer Science and Engineering, BE Electrical and Elec
tronics Engineering, BE Electronics and Communication Engineering, BE Mechanical
Engineering: 28 colleges
B.Tech Civil Engineering, B.Tech Computer Science and Engineering, B.Tech Electri
cal and Electronics Engineering, B.Tech Electronics and Communication Engineerin
g, B.Tech Mechanical Engineering: 26 colleges
B.Tech Civil Engineering, B.Tech Computer Science and Engineering, B.Tech Electri
cal Engineering, B.Tech Electronics and Communication Engineering, B.Tech Mechani
cal Engineering: 25 colleges
Diploma in Civil Engineering, Diploma in Computer Engineering, Diploma in Electri
cal Engineering, Diploma in Electronics and Communication Engineering, Diploma in
Mechanical Engineering: 14 colleges
Diploma in Mechanical Engineering, Diploma in Automobile Engineering, Diploma in
Civil Engineering, Diploma in Electrical and Electronics Engineering, Diploma in
Electronics and Communication Engineering: 13 colleges
Diploma in Civil Engineering, Diploma in Computer Science and Engineering, Diplom
a in Electronics and Communication Engineering, Diploma in Mechanical Engineerin
g: 12 colleges
BE Mechanical Engineering, BE Civil Engineering, BE Computer Science and Engineer
ing, BE Electrical and Electronics Engineering, BE Electronics and Communication
Engineering: 11 colleges
Diploma in Mechanical Engineering, Diploma in Civil Engineering, Diploma in Compu
ter Engineering, Diploma in Electrical and Electronics Engineering, Diploma in El
ectronics and Communication Engineering: 11 colleges
BE Civil Engineering, BE Computer Science and Engineering, BE Electronics and Com
munication Engineering, BE Mechanical Engineering: 11 colleges
Diploma in Civil Engineering, Diploma in Computer Engineering, Diploma in Electri
cal and Electronics Engineering, Diploma in Electronics and Communication Enginee
ring, Diploma in Mechanical Engineering: 11 colleges
B.Arch, M.Arch: 10 colleges
Diploma in Mechanical Engineering, Diploma in Automobile Engineering, Diploma in
Civil Engineering, Diploma in Computer Engineering, Diploma in Electrical and Ele
ctronics Engineering, Diploma in Electronics and Communication Engineering: 10 co
lleges
Diploma in Civil Engineering, Diploma in Electrical Engineering, Diploma in Elect
ronics and Telecommunication Engineering, Diploma in Mechanical Engineering: 9 co
lleges
Diploma in Mechanical Engineering, Diploma in Civil Engineering, Diploma in Elect
rical and Electronics Engineering, Diploma in Electronics and Communication Engin
eering: 9 colleges
Diploma in Civil Engineering, Diploma in Computer Engineering, Diploma in Electri
cal Engineering, Diploma in Electronics and Telecommunication Engineering, Diplom
a in Mechanical Engineering: 9 colleges
Diploma in Civil Engineering, Diploma in Computer Science and Engineering, Diplom
a in Electrical Engineering, Diploma in Mechanical Engineering: 8 colleges
Diploma in Mechanical Engineering, Diploma in Civil Engineering, Diploma in Compu
ter Engineering, Diploma in Electronics and Telecommunication Engineering: 8 coll
eges
B.Tech Civil Engineering, B.Tech Computer Science and Engineering, B.Tech Mechani
cal Engineering, B.Tech Electrical and Electronics Engineering, B.Tech Electronic
s and Communication Engineering: 8 colleges
```

In [136…

```
# Filter for colleges offering B.Tech courses
btech_courses = india_colleges['Courses'].str.contains('B.Tech', case=False, na=
# Count the number of colleges offering B.Tech
```

```
num_btech_courses = btech_courses.sum()
# Display the result
print("Number of colleges offering B.Tech courses:", num_btech_courses)
```

```
Number of colleges offering B.Tech courses: 2649
```

In [55]:
```
# Count unique courses and sum their occurrences
courses_sum = india_colleges['Courses'].value_counts().sum()
print("Total number of different courses offered across all colleges:", courses_
```

```
Total number of different courses offered across all colleges: 5446
```

In [140…
```
# Split the 'Courses' column if it contains multiple courses in a single entry
# Assuming courses are separated by a delimiter like ',' (adjust if necessary)
india_colleges['Course Count'] = india_colleges['Courses'].str.split(',').apply(
# Find the maximum number of courses offered by a single college
max_courses = india_colleges['Course Count'].max()
# Find the colleges offering the maximum number of courses
colleges_with_max_courses = india_colleges[india_colleges['Course Count'] == max
print(f"Maximum number of courses offered by a single college: {max_courses}")
print("Colleges offering the maximum number of courses:")
print(colleges_with_max_courses[['College Name', 'Courses']])  # Adjust column n
```

```
Maximum number of courses offered by a single college: 1230
Colleges offering the maximum number of courses:
          College Name                                              Courses
2870  Ansal University  B.Arch, B.Com Hons Collaboration with Universi...
```

In [ ]:
```
```

In [150…
```
india_colleges.columns
```

Out[150…
```
Index(['College Name', 'Genders Accepted', 'Campus Size',
       'Total Student Enrollments', 'Total Faculty', 'Established Year',
       'Rating', 'University', 'Courses', 'Facilities', 'City', 'State',
       'Country', 'College Type', 'Average Fees', 'Course Count'],
      dtype='object')
```

In [152…
```
india_colleges['Total Faculty'].value_counts()
```

Out[152…
```
Total Faculty
60     63
36     58
61     57
45     54
52     54
       ..
453     1
598     1
431     1
359     1
219     1
Name: count, Length: 420, dtype: int64
```

In [60]:
```
# Filter the dataset for Amity University
amity_faculty = india_colleges[india_colleges['College Name'].str.contains('Amit
# Display the faculty count for Amity University
if 'Total Faculty' in india_colleges.columns:
    print("Faculty information for Amity University:")
    print(amity_faculty[['College Name', 'Total Faculty']])
```

```
else:
    print("The dataset does not have a column for faculty count.")
```

```
Faculty information for Amity University:
         College Name Total Faculty
516   Amity University           289
517   Amity University           210
738   Amity University           355
788   Amity University           143
1086  Amity University           142
1526  Amity University           NaN
```

In [158…
```
# Filter the dataset for Amity University colleges
amity_colleges = india_colleges[india_colleges['College Name'].str.contains('Ami
# Display the college names and state names
print("Amity Colleges with State Names:")
print(amity_colleges[['College Name', 'State']])  # Adjust column names if neces
```

```
Amity Colleges with State Names:
                                  College Name           State
141                  Amity School of Engineering   Uttar Pradesh
220   Amity School of Engineering and Technology           Delhi
516                             Amity University   Uttar Pradesh
517                             Amity University       Rajasthan
636   Amity School of Engineering and Technology   Uttar Pradesh
738                             Amity University         Haryana
788                             Amity University  Madhya Pradesh
1086                            Amity University     West Bengal
1526                            Amity University       Jharkhand
1628           Amity School of Distance Learning   Uttar Pradesh
1857            Amity Institute of Biotechnology   Uttar Pradesh
3995          Amity Institute of Food Technology   Uttar Pradesh
4161   Amity School of Architecture and Planning   Uttar Pradesh
4772  Amity School of Engineering and Technology  Madhya Pradesh
```

In [62]:
```
india_colleges['Rating'].value_counts()
```

Out[62]:
```
Rating
3.08    13
3.09    12
3.11    11
3.02    11
3.1     10
        ..
3.38     1
2.93     1
2.64     1
3.28     1
2.8      1
Name: count, Length: 110, dtype: int64
```

In [168…
```
# Ensure 'Rating' column exists
if 'Rating' in india_colleges.columns:
    # Convert 'Rating' to numeric, if necessary
    india_colleges['Rating'] = pd.to_numeric(india_colleges['Rating'], errors='c

    # Drop rows with missing values in 'Rating'
    india_colleges = india_colleges.dropna(subset=['Rating'])

    # Find the maximum rating
    max_rating = india_colleges['Rating'].max()
```

```
    # Filter colleges with the maximum rating
    top_rated_colleges = india_colleges[india_colleges['Rating'] == max_rating]

    # Display results
    print("Maximum rating: {max_rating}")
    print("College(s) with the maximum rating:")
    print(top_rated_colleges[['College Name', 'Rating', 'State']])  # Adjust col
else:
    print("The dataset does not have a 'Rating' column.")
```

```
Maximum rating: {max_rating}
College(s) with the maximum rating:
                College Name  Rating      State
5  BMS College of Engineering    3.83  Karnataka
```

```
C:\Users\Lenovo\AppData\Local\Temp\ipykernel_1632\448274618.py:4: SettingWithCopy
Warning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy
  india_colleges['Rating'] = pd.to_numeric(india_colleges['Rating'], errors='coer
ce')
```

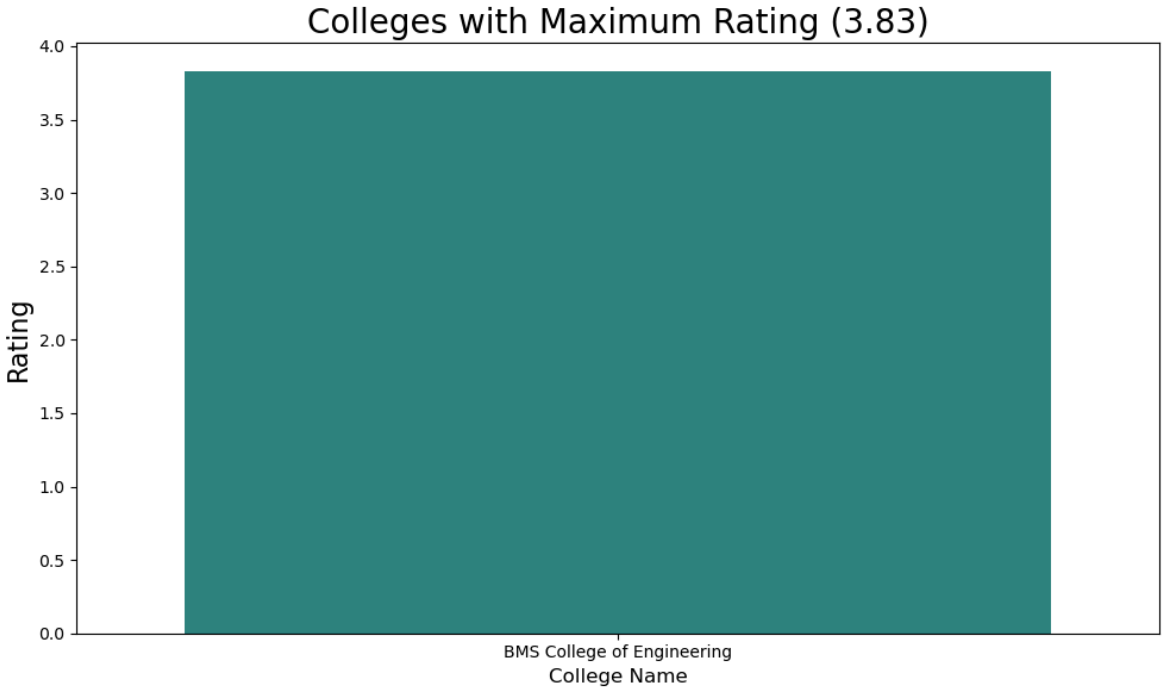
In [66]:
```
india_colleges['University'].value_counts().head(20)
```

Out[66]:
```
University
Anna University, Chennai                                    511
Dr APJ Abdul Kalam Technical University, Lucknow            282
Jawaharlal Nehru Technological University, Hyderabad        245
Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal            208
Jawaharlal Nehru Technological University, Kakinada         193
Gujarat Technological University, Ahmedabad                 189
Visvesvaraya Technological University, Belagavi             178
APJ Abdul Kalam Technological University, Thiruvananthapuram    149
Savitribai Phule Pune University, Pune                      128
Jawaharlal Nehru Technological University, Anantapur        117
Rajasthan Technical University, Kota                        113
Biju Patnaik University of Technology, Rourkela              90
Maulana Abul Kalam Azad University of Technology, Kolkata    86
IK Gujral Punjab Technical University, Jalandhar             84
University of Mumbai, Mumbai                                 78
Chhattisgarh Swami Vivekanand Technical University, Bhilai   65
Kurukshetra University, Kurukshetra                          58
Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur       52
Maharshi Dayanand University, Rohtak                         49
Dr Babasaheb Ambedkar Technological University, Lonere       47
Name: count, dtype: int64
```

In [68]:
```
# Ensure 'Rating' is numeric and drop missing values
india_colleges['Rating'] = pd.to_numeric(india_colleges['Rating'], errors='coerc
india_colleges = india_colleges.dropna(subset=['Rating'])
# Find the maximum rating and filter colleges with this rating
max_rating = india_colleges['Rating'].max()
top_rated_colleges = india_colleges[india_colleges['Rating'] == max_rating]
# Create a bar plot to visualize the colleges with the maximum rating
plt.figure(figsize=(10, 6))
sns.barplot(x='College Name', y='Rating', data=top_rated_colleges, palette='viri
```

```
# Rotate x-axis labels for better readability
#plt.xticks(rotation=180)

# Add titles and labels
plt.title(f"Colleges with Maximum Rating ({max_rating})", fontsize=20)
plt.xlabel("College Name", fontsize=12)
plt.ylabel("Rating", fontsize=16)

# Show the plot
plt.tight_layout()
plt.show()
```

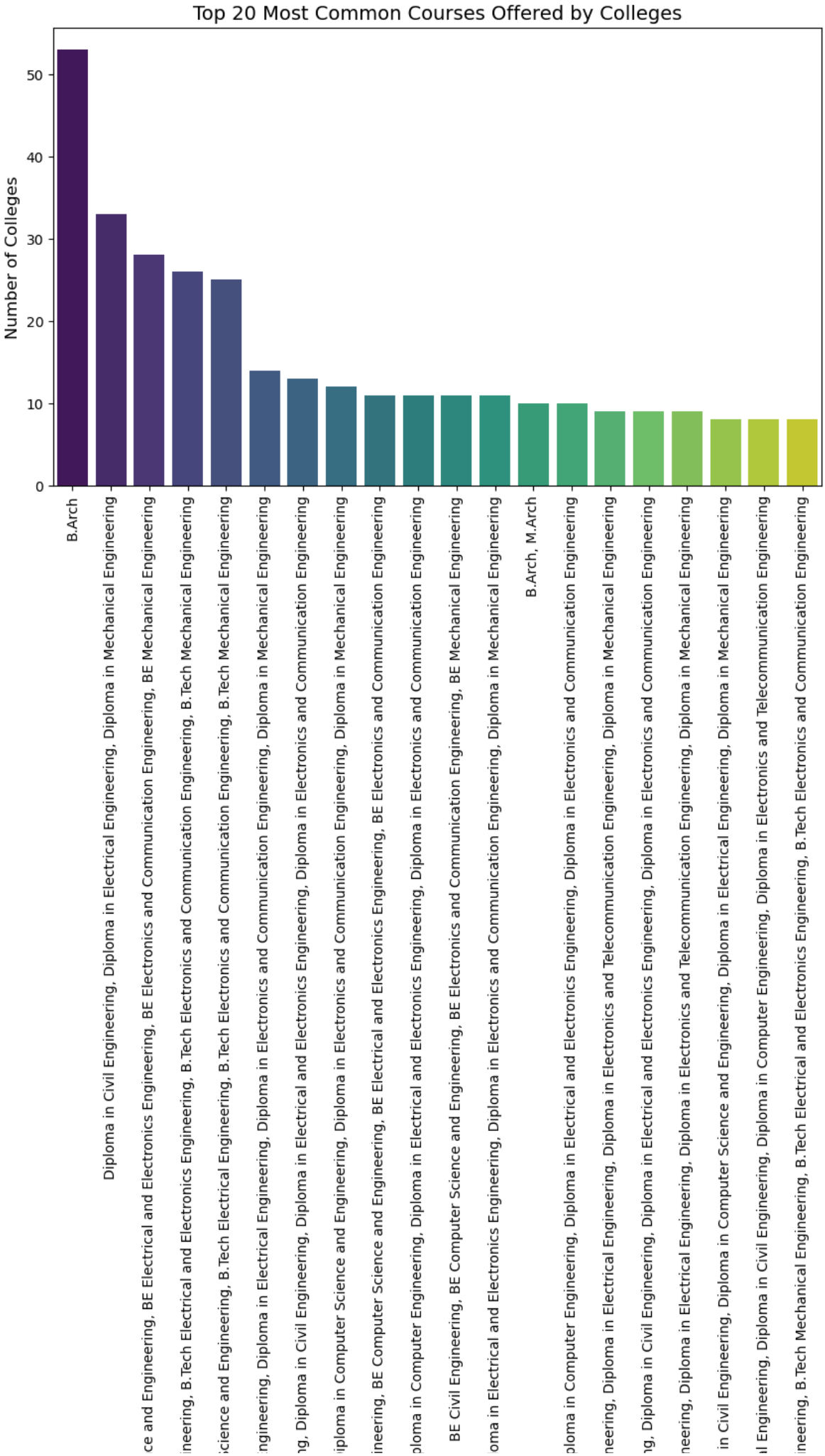
```
C:\Users\Lenovo\AppData\Local\Temp\ipykernel_2904\4245288375.py:9: FutureWarning:


Passing `palette` without assigning `hue` is deprecated and will be removed in v
0.14.0. Assign the `x` variable to `hue` and set `legend=False` for the same effe
ct.
```



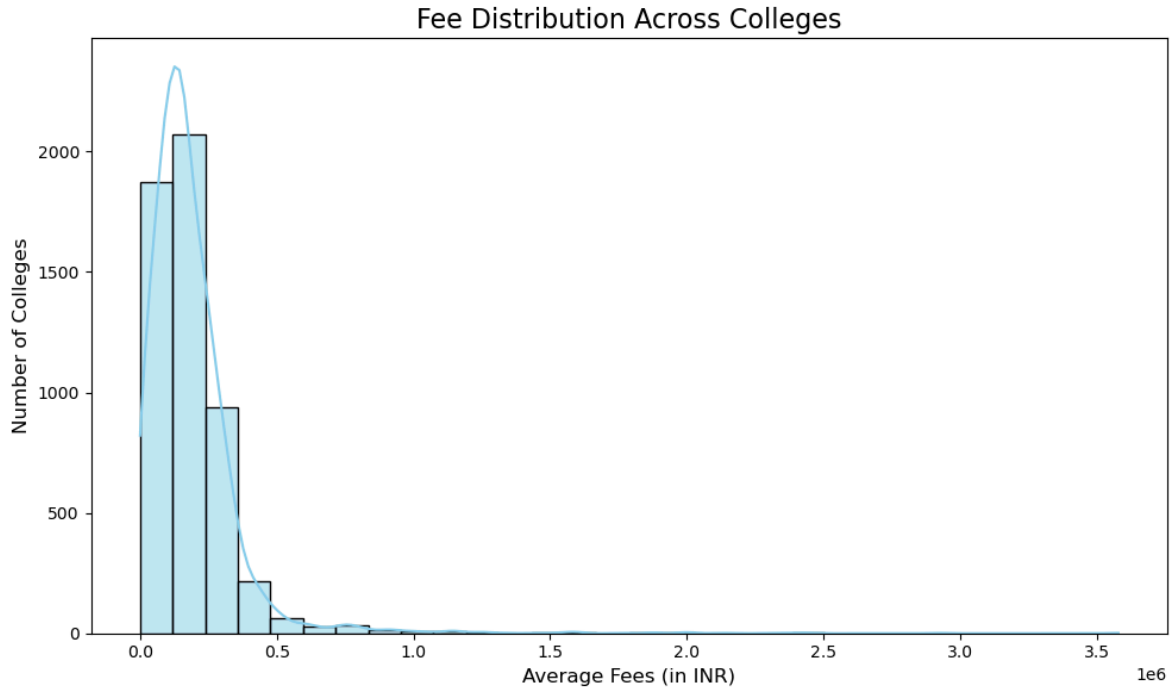
In [8]:
```
import matplotlib.pyplot as plt
import seaborn as sns

# Count the top 20 most common courses
courses = india_colleges['Courses'].value_counts().head(20)

# Create a bar plot to visualize the most common courses
plt.figure(figsize=(10, 6), dpi=100)  # Adjusted DPI

sns.barplot(x=courses.index, y=courses.values, palette='viridis')

# Rotate x-axis labels for better readability
plt.xticks(rotation=90, fontsize=10)  # Reduced font size for x-axis labels

# Add titles and labels
plt.title("Top 20 Most Common Courses Offered by Colleges", fontsize=14)  # Redu
plt.xlabel("Courses", fontsize=12)
```

```
plt.ylabel("Number of Colleges", fontsize=12)

# Use tight_layout to ensure the plot fits properly
plt.tight_layout()

# Show the plot
plt.show()
```

```
C:\Users\Lenovo\AppData\Local\Temp\ipykernel_10172\2173248967.py:10: FutureWarnin
g:

Passing `palette` without assigning `hue` is deprecated and will be removed in v
0.14.0. Assign the `x` variable to `hue` and set `legend=False` for the same effe
ct.

  sns.barplot(x=courses.index, y=courses.values, palette='viridis')
C:\Users\Lenovo\AppData\Local\Temp\ipykernel_10172\2173248967.py:21: UserWarning:
Tight layout not applied. The bottom and top margins cannot be made large enough
to accommodate all Axes decorations.
  plt.tight_layout()
```


Top 20 Most Common Courses Offered by Colleges
Number of Colleges
0
10
20
30
40
50
B.Arch
Diploma in Civil Engineering, Diploma in Electrical Engineering, Diploma in Mechanical Engineering
ce and Engineering, BE Electrical and Electronics Engineering, BE Electronics and Communication Engineering, BE Mechanical Engineering
ineering, B.Tech Electrical and Electronics Engineering, B.Tech Electronics and Communication Engineering, B.Tech Mechanical Engineering
cience and Engineering, B.Tech Electrical Engineering, B.Tech Electronics and Communication Engineering, B.Tech Mechanical Engineering
ngineering, Diploma in Electrical Engineering, Diploma in Electronics and Communication Engineering, Diploma in Mechanical Engineering
g, Diploma in Civil Engineering, Diploma in Electrical and Electronics Engineering, Diploma in Electronics and Communication Engineering
iploma in Computer Science and Engineering, Diploma in Electronics and Communication Engineering, Diploma in Mechanical Engineering
ineering, BE Computer Science and Engineering, BE Electrical and Electronics Engineering, BE Electronics and Communication Engineering
ploma in Computer Engineering, Diploma in Electrical and Electronics Engineering, Diploma in Electronics and Communication Engineering
BE Civil Engineering, BE Computer Science and Engineering, BE Electronics and Communication Engineering, BE Mechanical Engineering
oma in Electrical and Electronics Engineering, Diploma in Electronics and Communication Engineering, Diploma in Mechanical Engineering
B.Arch, M.Arch
ploma in Computer Engineering, Diploma in Electrical and Electronics Engineering, Diploma in Electronics and Communication Engineering
neering, Diploma in Electrical Engineering, Diploma in Electronics and Telecommunication Engineering, Diploma in Mechanical Engineering
g, Diploma in Civil Engineering, Diploma in Electrical and Electronics Engineering, Diploma in Electronics and Communication Engineering
neering, Diploma in Electrical Engineering, Diploma in Electronics and Telecommunication Engineering, Diploma in Mechanical Engineering
in Civil Engineering, Diploma in Computer Science and Engineering, Diploma in Electrical Engineering, Diploma in Mechanical Engineering
l Engineering, Diploma in Civil Engineering, Diploma in Computer Engineering, Diploma in Electronics and Telecommunication Engineering
ineering, B.Tech Mechanical Engineering, B.Tech Electrical and Electronics Engineering, B.Tech Electronics and Communication Engineering

In [37]:
```
# Create a histogram to visualize the fee distribution
plt.figure(figsize=(10, 6))
sns.histplot(india_colleges['Average Fees'], bins=30, kde=True, color='skyblue')

# Add titles and labels
plt.title("Fee Distribution Across Colleges", fontsize=16)
plt.xlabel("Average Fees (in INR)", fontsize=12)
plt.ylabel("Number of Colleges", fontsize=12)

# Show the plot
plt.tight_layout()
plt.show()
```



In [2]:
```
pip install dash plotly pandas
```

```
Requirement already satisfied: dash in c:\users\lenovo\anaconda3\lib\site-package
s (2.18.2)
Requirement already satisfied: plotly in c:\users\lenovo\anaconda3\lib\site-packa
ges (5.24.1)
Requirement already satisfied: pandas in c:\users\lenovo\anaconda3\lib\site-packa
ges (2.2.2)
Requirement already satisfied: Flask<3.1,>=1.0.4 in c:\users\lenovo\anaconda3\lib
\site-packages (from dash) (3.0.3)
Requirement already satisfied: Werkzeug<3.1 in c:\users\lenovo\anaconda3\lib\site
-packages (from dash) (3.0.3)
Requirement already satisfied: dash-html-components==2.0.0 in c:\users\lenovo\ana
conda3\lib\site-packages (from dash) (2.0.0)
Requirement already satisfied: dash-core-components==2.0.0 in c:\users\lenovo\ana
conda3\lib\site-packages (from dash) (2.0.0)
Requirement already satisfied: dash-table==5.0.0 in c:\users\lenovo\anaconda3\lib
\site-packages (from dash) (5.0.0)
Requirement already satisfied: importlib-metadata in c:\users\lenovo\anaconda3\li
b\site-packages (from dash) (7.0.1)
Requirement already satisfied: typing-extensions>=4.1.1 in c:\users\lenovo\anacon
da3\lib\site-packages (from dash) (4.11.0)
Requirement already satisfied: requests in c:\users\lenovo\anaconda3\lib\site-pac
kages (from dash) (2.32.3)
Requirement already satisfied: retrying in c:\users\lenovo\anaconda3\lib\site-pac
kages (from dash) (1.3.4)
Requirement already satisfied: nest-asyncio in c:\users\lenovo\anaconda3\lib\site
-packages (from dash) (1.6.0)
Requirement already satisfied: setuptools in c:\users\lenovo\anaconda3\lib\site-p
ackages (from dash) (75.1.0)
Requirement already satisfied: tenacity>=6.2.0 in c:\users\lenovo\anaconda3\lib\s
ite-packages (from plotly) (8.2.3)
Requirement already satisfied: packaging in c:\users\lenovo\anaconda3\lib\site-pa
ckages (from plotly) (24.1)
Requirement already satisfied: numpy>=1.26.0 in c:\users\lenovo\anaconda3\lib\sit
e-packages (from pandas) (1.26.4)
Requirement already satisfied: python-dateutil>=2.8.2 in c:\users\lenovo\anaconda
3\lib\site-packages (from pandas) (2.9.0.post0)
Requirement already satisfied: pytz>=2020.1 in c:\users\lenovo\anaconda3\lib\site
-packages (from pandas) (2024.1)
Requirement already satisfied: tzdata>=2022.7 in c:\users\lenovo\anaconda3\lib\si
te-packages (from pandas) (2023.3)
Requirement already satisfied: Jinja2>=3.1.2 in c:\users\lenovo\anaconda3\lib\sit
e-packages (from Flask<3.1,>=1.0.4->dash) (3.1.4)
Requirement already satisfied: itsdangerous>=2.1.2 in c:\users\lenovo\anaconda3\l
ib\site-packages (from Flask<3.1,>=1.0.4->dash) (2.2.0)
Requirement already satisfied: click>=8.1.3 in c:\users\lenovo\anaconda3\lib\site
-packages (from Flask<3.1,>=1.0.4->dash) (8.1.7)
Requirement already satisfied: blinker>=1.6.2 in c:\users\lenovo\anaconda3\lib\si
te-packages (from Flask<3.1,>=1.0.4->dash) (1.6.2)
Requirement already satisfied: six>=1.5 in c:\users\lenovo\anaconda3\lib\site-pac
kages (from python-dateutil>=2.8.2->pandas) (1.16.0)
Requirement already satisfied: MarkupSafe>=2.1.1 in c:\users\lenovo\anaconda3\lib
\site-packages (from Werkzeug<3.1->dash) (2.1.3)
Requirement already satisfied: zipp>=0.5 in c:\users\lenovo\anaconda3\lib\site-pa
ckages (from importlib-metadata->dash) (3.17.0)
Requirement already satisfied: charset-normalizer<4,>=2 in c:\users\lenovo\anacon
da3\lib\site-packages (from requests->dash) (3.3.2)
Requirement already satisfied: idna<4,>=2.5 in c:\users\lenovo\anaconda3\lib\site
-packages (from requests->dash) (3.7)
Requirement already satisfied: urllib3<3,>=1.21.1 in c:\users\lenovo\anaconda3\li
b\site-packages (from requests->dash) (2.2.3)
```

```
Requirement already satisfied: certifi>=2017.4.17 in c:\users\lenovo\anaconda3\li
b\site-packages (from requests->dash) (2024.8.30)
Requirement already satisfied: colorama in c:\users\lenovo\anaconda3\lib\site-pac
kages (from click>=8.1.3->Flask<3.1,>=1.0.4->dash) (0.4.6)
Note: you may need to restart the kernel to use updated packages.
```

In [ ]:

In [8]:
```
import dash
import dash_core_components as dcc
import dash_html_components as html
import pandas as pd
import plotly.express as px

# Load your data
india_colleges = pd.read_csv(r'C:\Users\Lenovo\Downloads\engineering colleges in

# Clean column names by stripping extra spaces
india_colleges.columns = india_colleges.columns.str.strip()

# Check if 'Average Fees' column exists
if 'Average Fees' in india_colleges.columns:
    # Convert 'Average Fees' to numeric and drop rows with missing values
    india_colleges['Average Fees'] = pd.to_numeric(india_colleges['Average Fees'
    india_colleges = india_colleges.dropna(subset=['Average Fees'])
else:
    print("The 'Average Fees' column does not exist in the dataset. Please check

# Check if 'Total Faculty' column exists
if 'Total Faculty' in india_colleges.columns:
    # Convert 'Total Faculty' to numeric and drop rows with missing values
    india_colleges['Total Faculty'] = pd.to_numeric(india_colleges['Total Facult
    india_colleges = india_colleges.dropna(subset=['Total Faculty'])
else:
    print("The 'Total Faculty' column does not exist in the dataset. Please chec

# Count colleges per state
state_college_counts = india_colleges['State'].value_counts().reset_index()
state_college_counts.columns = ['State', 'Number of Colleges']

# Count most common courses
courses = india_colleges['Courses'].value_counts().head(20).reset_index()
courses.columns = ['Course', 'Number of Colleges']

# Create a Dash app
app = dash.Dash(__name__)

# Layout of the dashboard
app.layout = html.Div(
    style={'backgroundColor': '#ffcccc', 'padding': '20px'},  # Light red backgr
    children=[
        html.H1("Indian Colleges Dashboard", style={'text-align': 'center', 'col

    # Dropdown for State Selection
    html.Div([
        html.Label("Select State:"),
        dcc.Dropdown(
            id='state-dropdown',
            options=[{'label': state, 'value': state} for state in india_college
            value='Maharashtra',  # Default value
```

```
            style={'width': '50%'}
        ),
    ], style={'padding': 20}),

    # Bar plot for Number of Colleges per State
    html.Div([
        dcc.Graph(
            id='state-colleges-barplot',
            figure={
                'data': [{
                    'x': state_college_counts['State'],
                    'y': state_college_counts['Number of Colleges'],
                    'type': 'bar',
                    'name': 'Colleges by State'
                }],
                'layout': {
                    'title': 'Number of Colleges per State'
                }
            }
        ),
    ], style={'padding': 20}),

    # Bar plot for Most Common Courses
    html.Div([
        dcc.Graph(
            id='courses-barplot',
            figure={
                'data': [{
                    'x': courses['Course'],
                    'y': courses['Number of Colleges'],
                    'type': 'bar',
                    'name': 'Common Courses'
                }],
                'layout': {
                    'title': 'Top 20 Most Common Courses'
                }
            }
        ),
    ], style={'padding': 20}),

    # Fee Distribution Box Plot (now using 'Average Fees')
    html.Div([
        dcc.Graph(
            id='fee-distribution',
            figure=px.box(india_colleges, y='Average Fees', title="Fee Distribut
        ),
    ], style={'padding': 20}),

    # Faculty Distribution Box Plot (now using 'Total Faculty')
    html.Div([
        dcc.Graph(
            id='faculty-distribution',
            figure=px.box(india_colleges, y='Total Faculty', title="Faculty Dist
        ),
    ], style={'padding': 20}),
])

# Run the server
if __name__ == '__main__':
    app.run_server(debug=True)
```

Loading...

In [ ]: