

## ▼ Import necessary libraries

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns

# importing the dependencies
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import StandardScaler
from sklearn.decomposition import PCA
from sklearn.cluster import KMeans
import numpy as np
import warnings
warnings.filterwarnings("ignore")
```

## ▼ Load the dataset

```
dataset_path = '/content/Online_Courses (1).csv'
data = pd.read_csv(dataset_path)
```

## ▼ Displaying the first few rows of the dataset

```
print("First 5 rows of the dataset:")
print(data.head())
```

```
First 5 rows of the dataset:
   Unnamed: 0  Title \
0           0  Machine Learning Specialization
1           1  Introduction to Data Science Specialization
2           2  Data Science Fundamentals with Python and SQL ...
3           3  Key Technologies for Business Specialization
4           4  Deep Learning Specialization

   URL \
0  https://www.coursera.org/specializations/machi...
1  https://www.coursera.org/specializations/intro...
2  https://www.coursera.org/specializations/data-...
3  https://www.coursera.org/specializations/key-t...
4  https://www.coursera.org/specializations/deep-...
```

	Short Intro	Category \
0	#BreakIntoAI with Machine Learning Specializat...	Data Science
1	Launch your career in data science. Gain found...	Data Science
2	Build the Foundation for your Data Science car...	Data Science
3	Get Ahead with Key Business Technologies. Gain...	Business
4	Become a Machine Learning expert. Master the f...	Data Science

	Sub-Category	Course Type	Language \
0	Machine Learning	Specialization	English
1	Data Analysis	Specialization	English
2	Data Analysis	Specialization	English
3	Business Essentials	Specialization	English
4	Machine Learning	Specialization	English

	Subtitle Languages \
0	Subtitles: English
1	Subtitles: English, Arabic, French, Portuguese...
2	Subtitles: English, Arabic, French, Portuguese...
3	Subtitles: English, Arabic, French, Portuguese...
4	Subtitles: English, Chinese (Traditional), Ara...

	Skills ...	Course Short Intro \
0	Decision Trees, Artificial Neural Network, Log...	NaN
1	Data Science, Relational Database Management S...	NaN
2	Data Science, Github, Python Programming, Jupy...	NaN
3	Data Science, Artificial Intelligence (AI), Bu...	NaN
4	Artificial Neural Network, Convolutional Neura...	NaN

	Weekly study	Premium course	What's include	Rank	Created by	Program \
0	NaN	NaN	NaN	NaN	NaN	NaN
1	NaN	NaN	NaN	NaN	NaN	NaN
2	NaN	NaN	NaN	NaN	NaN	NaN
3	NaN	NaN	NaN	NaN	NaN	NaN
4	NaN	NaN	NaN	NaN	NaN	NaN

	Number of ratings	Price	COURSE CATEGORIES
0	NaN	NaN	NaN
1	NaN	NaN	NaN
2	NaN	NaN	NaN
3	NaN	NaN	NaN
4	NaN	NaN	NaN

[5 rows x 45 columns]

## ▼ data type information and missing values

```
print("\nData type information:")
print(data.info())
```

Data type information:

```

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 8092 entries, 0 to 8091
Data columns (total 45 columns):
#   Column                                Non-Null Count  Dtype
---  -
0   Unnamed: 0                            8092 non-null   int64
1   Title                                8092 non-null   object
2   URL                                  8092 non-null   object
3   Short Intro                          8040 non-null   object
4   Category                             2819 non-null   object
5   Sub-Category                         2819 non-null   object
6   Course Type                          2819 non-null   object
7   Language                             2819 non-null   object
8   Subtitle Languages                   2802 non-null   object
9   Skills                               2099 non-null   object
10  Instructors                          2808 non-null   object
11  Rating                               2742 non-null   object
12  Number of viewers                     2695 non-null   object
13  Duration                             7944 non-null   object
14  Site                                 8092 non-null   object
15  Program Type                         282 non-null    object
16  Courses                             4944 non-null   object
17  Level                               181 non-null    object
18  Number of Reviews                    47 non-null     object
19  Unique Projects                      0 non-null      float64
20  Prerequisites                        281 non-null    object
21  What you learn                       278 non-null    object
22  Related Programs                     85 non-null     object
23  Monthly access                       98 non-null     object
24  6-Month access                       2 non-null      object
25  4-Month access                       38 non-null     object
26  3-Month access                       26 non-null     object
27  5-Month access                       2 non-null      object
28  2-Month access                       10 non-null     object
29  School                               271 non-null    object
30  Topics related to CRM                 4666 non-null   object
31  ExpertTracks                         4843 non-null   object
32  FAQs                                 1083 non-null   object
33  Course Title                         4843 non-null   object
34  Course URL                           4843 non-null   object
35  Course Short Intro                   4843 non-null   object
36  Weekly study                         4843 non-null   object
37  Premium course                       1622 non-null   object
38  What's include                       419 non-null    object
39  Rank                                 37 non-null     object
40  Created by                           37 non-null     object
41  Program                              148 non-null    object
42  Number of ratings                    126 non-null    object
43  Price                                65 non-null     float64
44  COURSE CATEGORIES                    148 non-null    object
dtypes: float64(2), int64(1), object(42)
memory usage: 2.8+ MB
None

```

```
# Display summary statistics for numerical columns
```

```
# Display summary statistics for numerical columns
print("\nSummary statistics:")
print(data.describe())
```

```
Summary statistics:
      Unnamed: 0  Unique Projects      Price
count  8092.00000      0.0      65.000000
mean   1946.04214      NaN     903.830769
std    1346.92197      NaN     665.949617
min      0.00000      NaN     129.000000
25%    796.00000      NaN     534.000000
50%   1807.50000      NaN     855.000000
75%   2819.25000      NaN    1099.000000
max   4842.00000      NaN   4600.000000
```

```
for col in data.columns:
    print(col)
```

```
Unnamed: 0
Title
URL
Short Intro
Category
Sub-Category
Course Type
Language
Subtitle Languages
Skills
Instructors
Rating
Number of viewers
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Program Type
Courses
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3-Month access
5-Month access
2-Month access
School
Topics related to CRM
ExpertTracks
FAQs
Course Title
Course URL
Course Short Intro
Weekly study
```

.....  
Premium course  
What's include  
Rank  
Created by  
Program  
Number of ratings  
Price  
COURSE CATEGORIES

## ▼ Exploratory Data Analysis (EDA)

data

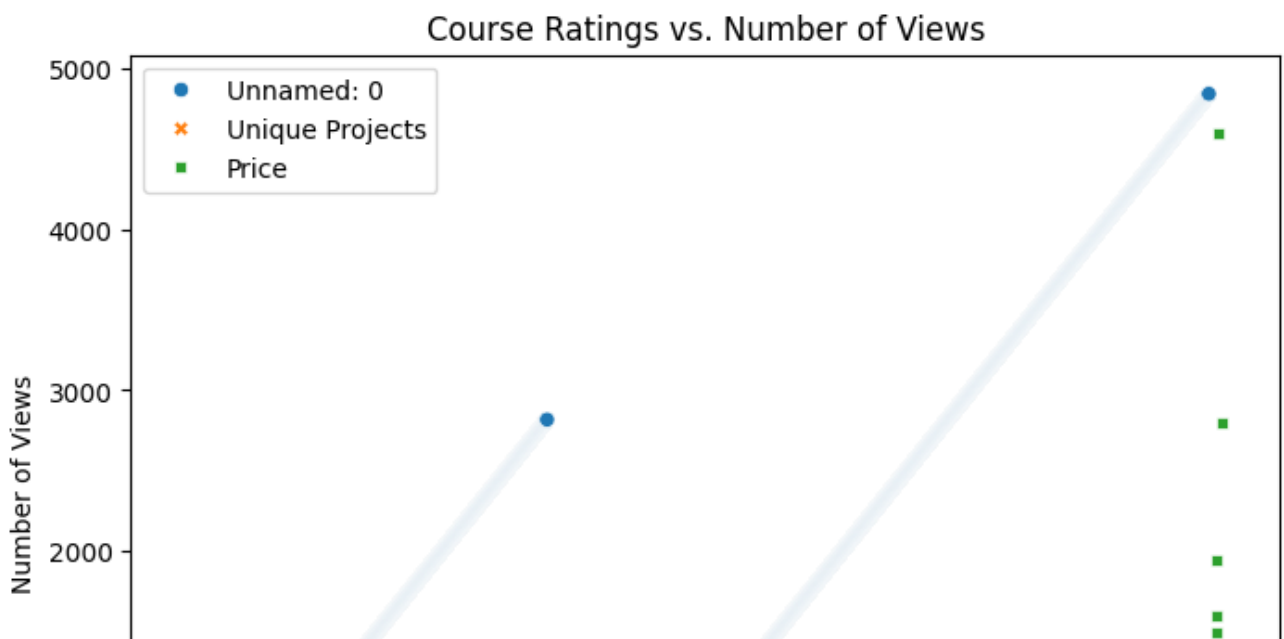
	Unnamed: 0	Title	URL	Short Intro	Category	Sub-Category	Co
0	0	Machine Learning Specialization	<a href="https://www.coursera.org/specializations/machi...">https://www.coursera.org/specializations/machi...</a>	#BreakIntoAI with Machine Learning Specializat...	Data Science	Machine Learning	St
1	1	Introduction to Data Science Specialization	<a href="https://www.coursera.org/specializations/intro...">https://www.coursera.org/specializations/intro...</a>	Launch your career in data science. Gain found...	Data Science	Data Analysis	St
2	2	Data Science Fundamentals with Python and SQL ...	<a href="https://www.coursera.org/specializations/data-...">https://www.coursera.org/specializations/data-...</a>	Build the Foundation for your Data Science car...	Data Science	Data Analysis	St
3	3	Key Technologies for Business Specialization	<a href="https://www.coursera.org/specializations/key-t...">https://www.coursera.org/specializations/key-t...</a>	Get Ahead with Key Business Technologies. Gain...	Business	Business Essentials	St
4	4	Deep Learning Specialization	<a href="https://www.coursera.org/specializations/deep-...">https://www.coursera.org/specializations/deep-...</a>	Become a Machine Learning expert. Master the f...	Data Science	Machine Learning	St
...	...	...	...	...	...	...	...
8087	143	Certified Scrum Master	<a href="https://www.simplilearn.com/certified-scrum-ma">https://www.simplilearn.com/certified-scrum-ma</a>	This Certified ScrumMaster® (CSM)	NaN	NaN	

			certificatio...			
8088	144	Salesforce Basics Course for Beginners	<a href="https://www.simplilearn.com/salesforce-course?...">https://www.simplilearn.com/salesforce-course?...</a>	NaN	NaN	NaN
8089	145	ICP-ACC (ICAgile Certified Agile Coaching) Cer...	<a href="https://www.simplilearn.com/certified-agile-co...">https://www.simplilearn.com/certified-agile-co...</a>	This ICP-ACC Certification Training Course aim...	NaN	NaN
8090	146	/ irisprodflip456	<a href="https://www.simplilearn.com/irisprodflip456?tag=...">https://www.simplilearn.com/irisprodflip456?tag=...</a>	Iris Production check 456	NaN	NaN
8091	147	Introduction to Industry 4.0	<a href="https://www.simplilearn.com/introduction-indus...">https://www.simplilearn.com/introduction-indus...</a>	Introduction to Industry 4.0	NaN	NaN

8092 rows × 45 columns

## ✓ Analyzing Popular Courses

```
# Scatter plot of course ratings vs. number of views
plt.figure(figsize=(8, 6))
sns.scatterplot( data=data)
plt.title("Course Ratings vs. Number of Views")
plt.xlabel("Rating")
plt.ylabel("Number of Views")
plt.show()
```



## ✓ Segmenting Data by Language

```
# Bar plot showing course categories by language
plt.figure(figsize=(12, 6))
sns.countplot( data=data)
plt.title("Course Categories by Language")
plt.xlabel("Category")
plt.ylabel("Count")
plt.legend(title='Language')
plt.show()
```

```
# Analyze further based on the data
print()
print(data)
```

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4	4	Deep Learning Specialization
...	...	...
8087	143	Certified Scrum Master
8088	144	Salesforce Basics Course for Beginners
8089	145	ICP-ACC (ICAgile Certified Agile Coaching) Cer...
8090	146	/irisprodflip456
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	URL \
0	<a href="https://www.coursera.org/specializations/machi...">https://www.coursera.org/specializations/machi...</a>
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3	<a href="https://www.coursera.org/specializations/key-t...">https://www.coursera.org/specializations/key-t...</a>
4	<a href="https://www.coursera.org/specializations/deep-...">https://www.coursera.org/specializations/deep-...</a>
...	...
8087	<a href="https://www.simplilearn.com/certified-scrum-ma...">https://www.simplilearn.com/certified-scrum-ma...</a>
8088	<a href="https://www.simplilearn.com/salesforce-course?...">https://www.simplilearn.com/salesforce-course?...</a>
8089	<a href="https://www.simplilearn.com/certified-agile-co...">https://www.simplilearn.com/certified-agile-co...</a>
8090	<a href="https://www.simplilearn.com/irisprodflip456?tag=...">https://www.simplilearn.com/irisprodflip456?tag=...</a>
8091	<a href="https://www.simplilearn.com/introduction-indus...">https://www.simplilearn.com/introduction-indus...</a>

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4	Become a Machine Learning expert. Master the f...	Data Science
...	...	...
8087	This Certified ScrumMaster® (CSM) certificatio...	NaN
8088	NaN	NaN
8089	This ICP-ACC Certification Training Course aim...	NaN
8090	Iris Production check 456	NaN
8091	Introduction to Industry 4.0	NaN

	Sub-Category	Course Type	Language \
0	Machine Learning	Specialization	English
1	Data Analysis	Specialization	English
~	~ . . . . .	~ . . . . .	~ . . . . .



2	Data Analysis	Specialization	English
3	Business Essentials	Specialization	English
4	Machine Learning	Specialization	English
...	...	...	...
8087	NaN	NaN	NaN
8088	NaN	NaN	NaN
8089	NaN	NaN	NaN
8090	NaN	NaN	NaN
8091	NaN	NaN	NaN

	Subtitle Languages \
0	Subtitles: English
1	Subtitles: English, Arabic, French, Portuguese...
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3	Subtitles: English, Arabic, French, Portuguese...

```
# Distribution of course ratings
plt.figure(figsize=(8, 6))
sns.histplot(data, kde=True)
plt.title("Distribution of Course Ratings")
plt.xlabel("Rating")
plt.ylabel("Count")
plt.show()
```

## ✓ Analyzing Course Categories

```
# Count plot of course categories
plt.figure(figsize=(18, 12))
sns.countplot( data=data)
plt.title("Count of Course Categories")
plt.xlabel("Category")
plt.ylabel("Count")
plt.show()
```

## ✓ Short Course Introduction

```
# Display the first few rows of short course introductions
print("Short Course Introductions:")
print(data[[]].head(5))
```

```
Short Course Introductions:
Empty DataFrame
Columns: []
Index: [0, 1, 2, 3, 4]
```

## ✓ Popular Skills

```
# Split 'skills' by comma and create a count plot of the most common skills
```

```
plt.figure(figsize=(12, 6))
sns.histplot(data, kde=True)
plt.title("Top 10 Skills in Courses")
plt.xlabel("Count")
plt.ylabel("Skill")
plt.show()
```

```
# If there's a 'date_added' or similar field, analyze trends over time
if 'date_added' in data.columns:
    data['date_added'] = pd.to_datetime(data['date_added'])
    data['year'] = data['date_added'].dt.year
    plt.figure(figsize=(12, 6))
    sns.countplot(x='year', data=data)
    plt.title("Courses Added Over Time")
    plt.xlabel("Year")
    plt.ylabel("Number of Courses")
    plt.show()

# If multiple sites host courses, analyze them by site
if 'site' in data.columns:
    plt.figure(figsize=(12, 6))
    sns.countplot(x='site', data=data)
    plt.title("Course Distribution by Site")
    plt.xlabel("Site")
    plt.ylabel("Count")
    plt.show()
```

## ✓ Conclusion of E-Learning Platform

### Conclusion of E-Learning Platform Based on Market Segmentation and Analysis

Market segmentation and analysis are crucial in understanding the dynamics of the e-learning platform market. Here is a conclusion derived from a comprehensive study that considers several segmentation factors and market trends:

E-learning platforms offer vast opportunities in a rapidly growing market. Effective market

segmentation and analysis provide a pathway to success by addressing the unique needs of different user groups. Platforms that combine tailored content, technology innovation, and strong partnerships are well-positioned to thrive in this competitive landscape. By continuously adapting to market trends and user feedback, e-learning platforms can create lasting value and impact in the education sector

## Strategic Focus

To succeed in this dynamic environment, e-learning platforms should focus on:

- **Tailored Content:** Create content that meets the specific needs of each segment, including industry-specific courses, professional development, and academic programs.
- **Localized Content:** Invest in localization to reach global audiences, ensuring content is accessible and relevant across different regions.
- **Technology-Driven Solutions:** Embrace technology to enhance user experiences, utilizing AI, VR/AR, and data analytics to create personalized and engaging learning pathways.
- **Collaborative Partnerships:** Build relationships with educational institutions, industry leaders, and corporate clients to expand the platform's reach and credibility.
- **Strong Compliance and Security:** Maintain strict compliance with regulations and ensure data security to foster user trust.

By embracing these strategic focus areas, e-learning platforms can achieve sustainable growth and make a significant impact on the education landscape. As the market continues to evolve, platforms that remain adaptable and innovative will be best positioned for long-term success.

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

