



Task

Analyze student event feedback from "/content/Student_Satisfaction_Survey.csv" to uncover satisfaction trends and suggest improvements using survey data.

Load data

```
In [ ]: import pandas as pd
df = pd.read_csv('/content/Student_Satisfaction_Survey.csv', encoding='latin1')
display(df.head())
display(df.info())
```

	SN	Total Feedback Given	Total Configured	Questions	Weightage 1	Weightage 2	Weightage 3	\
0	1	1	12	How much of the syllabus was covered in the cl...	0	0	1	
1	2	1	12	How well did the teachers prepare for the clas...	0	0	0	
2	3	1	12	How well were the teachers able to communicate?	0	0	0	
3	4	1	12	The teacher's approach to teaching can best be...	0	0	1	
4	5	1	12	Fairness of the internal evaluation process by...	0	0	0	

```

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 580 entries, 0 to 579
Data columns (total 12 columns):
#   Column                                Non-Null Count  Dtype
---  -
0   SN                                    580 non-null    int64
1   Total Feedback Given                 580 non-null    int64
2   Total Configured                    580 non-null    int64
3   Questions                           580 non-null    object
4   Weightage 1                         580 non-null    int64
5   Weightage 2                         580 non-null    int64
6   Weightage 3                         580 non-null    int64
7   Weightage 4                         580 non-null    int64
8   Weightage 5                         580 non-null    int64
9   Average/ Percentage                 580 non-null    object
10  Course Name                         580 non-null    object
11  Basic Course                        580 non-null    object
dtypes: int64(8), object(4)
memory usage: 54.5+ KB
None

```

Data cleaning

```

In [ ]: print("Missing values before cleaning:")
        print(df.isnull().sum())
        print("\nData types before cleaning:")
        print(df.dtypes)

df['Average/ Percentage'] = df['Average/ Percentage'].astype(str).str.split('/')
df['Average/ Percentage'] = pd.to_numeric(df['Average/ Percentage'], errors='c

df_cleaned = df.drop(columns=['SN', 'Total Feedback Given', 'Total Configured'

display(df_cleaned.head())
display(df_cleaned.info())

```

Missing values before cleaning:

```
SN 0
Total Feedback Given 0
Total Configured 0
Questions 0
Weightage 1 0
Weightage 2 0
Weightage 3 0
Weightage 4 0
Weightage 5 0
Average/ Percentage 0
Course Name 0
Basic Course 0
dtype: int64
```

Data types before cleaning:

```
SN int64
Total Feedback Given int64
Total Configured int64
Questions object
Weightage 1 int64
Weightage 2 int64
Weightage 3 int64
Weightage 4 int64
Weightage 5 int64
Average/ Percentage object
Course Name object
Basic Course object
dtype: object
```

	Questions	Weightage 1	Weightage 2	Weightage 3	Weightage 4	Weightage 5	Average/ Percentage
0	How much of the syllabus was covered in the class?	0	0	1	0	0	
1	How well did the teachers prepare for the class?	0	0	0	0	1	
2	How well were the teachers able to communicate?	0	0	0	0	1	
3	The teacher's approach to teaching can best be described as...	0	0	1	0	0	
4	Fairness of the internal evaluation process by...	0	0	0	1	0	

```

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 580 entries, 0 to 579
Data columns (total 9 columns):
#   Column                Non-Null Count  Dtype
---  -
0   Questions              580 non-null   object
1   Weightage 1            580 non-null   int64
2   Weightage 2            580 non-null   int64
3   Weightage 3            580 non-null   int64
4   Weightage 4            580 non-null   int64
5   Weightage 5            580 non-null   int64
6   Average/ Percentage    580 non-null   float64
7   Course Name            580 non-null   object
8   Basic Course           580 non-null   object
dtypes: float64(1), int64(5), object(3)
memory usage: 40.9+ KB
None

```

Sentiment analysis

```

In [ ]: import nltk
        from nltk.sentiment.vader import SentimentIntensityAnalyzer

        nltk.download('vader_lexicon')

        analyzer = SentimentIntensityAnalyzer()

        df_cleaned['sentiment_score'] = df_cleaned['Questions'].apply(lambda x: analyzer
        display(df_cleaned.head())

```

```

[nltk_data] Downloading package vader_lexicon to /root/nltk_data...
[nltk_data]   Package vader_lexicon is already up-to-date!

```

	Questions	Weightage 1	Weightage 2	Weightage 3	Weightage 4	Weightage 5	A' Perc
0	How much of the syllabus was covered in the cl...	0	0	1	0	0	
1	How well did the teachers prepare for the clas...	0	0	0	0	1	
2	How well were the teachers able to communicate?	0	0	0	0	1	
3	The teacher's approach to teaching can best be...	0	0	1	0	0	
4	Fairness of the internal evaluation process by...	0	0	0	1	0	

```
In [ ]: from nltk.sentiment.vader import SentimentIntensityAnalyzer
import nltk

try:
    nltk.data.find('sentiment/vader_lexicon.zip')
except LookupError:
    nltk.download('vader_lexicon')

analyzer = SentimentIntensityAnalyzer()

df_cleaned['sentiment_score'] = df_cleaned['Questions'].apply(lambda x: analyzer
display(df_cleaned.head())
```

	Questions	Weightage 1	Weightage 2	Weightage 3	Weightage 4	Weightage 5	Average Percentage
0	How much of the syllabus was covered in the class?	0	0	1	0	0	
1	How well did the teachers prepare for the class?	0	0	0	0	1	
2	How well were the teachers able to communicate?	0	0	0	0	1	
3	The teacher's approach to teaching can be improved by...	0	0	1	0	0	
4	Fairness of the internal evaluation process by...	0	0	0	1	0	

Identify satisfaction trends

```
In [ ]: print(df_cleaned.columns)
```

```
Index(['Questions', 'Weightage 1', 'Weightage 2', 'Weightage 3', 'Weightage 4',
      'Weightage 5', 'Average/ Percentage', 'Course Name ', 'Basic Course',
      'sentiment_score'],
      dtype='object')
```

```
In [ ]: df_cleaned.rename(columns={'Course Name ': 'Course Name'}, inplace=True)

overall_average_sentiment = df_cleaned['sentiment_score'].mean()
print(f"Overall Average Sentiment Score: {overall_average_sentiment:.4f}")

course_sentiment = df_cleaned.groupby('Course Name')['sentiment_score'].mean()
print("\nAverage Sentiment Score by Course Name:")
display(course_sentiment)

basic_course_sentiment = df_cleaned.groupby('Basic Course')['sentiment_score']
print("\nAverage Sentiment Score by Basic Course:")
display(basic_course_sentiment)

print("\nSentiment Score Distribution (Descriptive Statistics):")
display(df_cleaned['sentiment_score'].describe())

plt.figure(figsize=(10, 6))
```

```
sns.histplot(df_cleaned['sentiment_score'], kde=True, bins=20)
plt.title('Distribution of Sentiment Scores')
plt.xlabel('Sentiment Score')
plt.ylabel('Frequency')
plt.grid(True)
plt.show()

question_sentiment = df_cleaned.groupby('Questions')['sentiment_score'].mean()

print("\nQuestions with Lowest Average Sentiment Scores:")
display(question_sentiment.head())

print("\nQuestions with Highest Average Sentiment Scores:")
display(question_sentiment.tail())
```

Overall Average Sentiment Score: 0.2873

Average Sentiment Score by Course Name:

	sentiment_score
Course Name	
FY B.VOC FOOD TECHNOLOGY	0.287335
FY BCOM (ACCOUNTING & FINANCE)	0.287335
FY BCOM (BANKING & INSURANCE)	0.287335
FYBA	0.287335
FYBMS	0.287335
FYBSC	0.287335
M.SC PART - 1 COMPUTER SCIENCE	0.287335
M.SC PART - 2 COMPUTER SCIENCE	0.287335
MA PSYCHOLOGY - 1	0.287335
MA PSYCHOLOGY - 3	0.287335
MSC ANALYTICAL CHEMISTRY SEM I	0.287335
MSC ANALYTICAL CHEMISTRY SEM III	0.287335
MSC DATA SCIENCE - 1	0.287335
MSC DATA SCIENCE - 3	0.287335
MSC INFORMATION TECHNOLOGY - 1	0.287335
MSC INFORMATION TECHNOLOGY - 3	0.287335
MSC MICROBIOLOGY - 1	0.287335
MSC MICROBIOLOGY - 3	0.287335
MSC ORGANIC CHEMISTRY - 3	0.287335
MSC PHYSICS - 3	0.287335
S.Y.B.A.F	0.287335
SY COMPUTER SCIENCE	0.287335
SYBCOM	0.287335
SYBMS	0.287335
SYBSC	0.287335
TYBA	0.287335
TYBCOM	0.287335
TYBMS	0.287335
TYBSC	0.287335

dtype: float64

Average Sentiment Score by Basic Course:

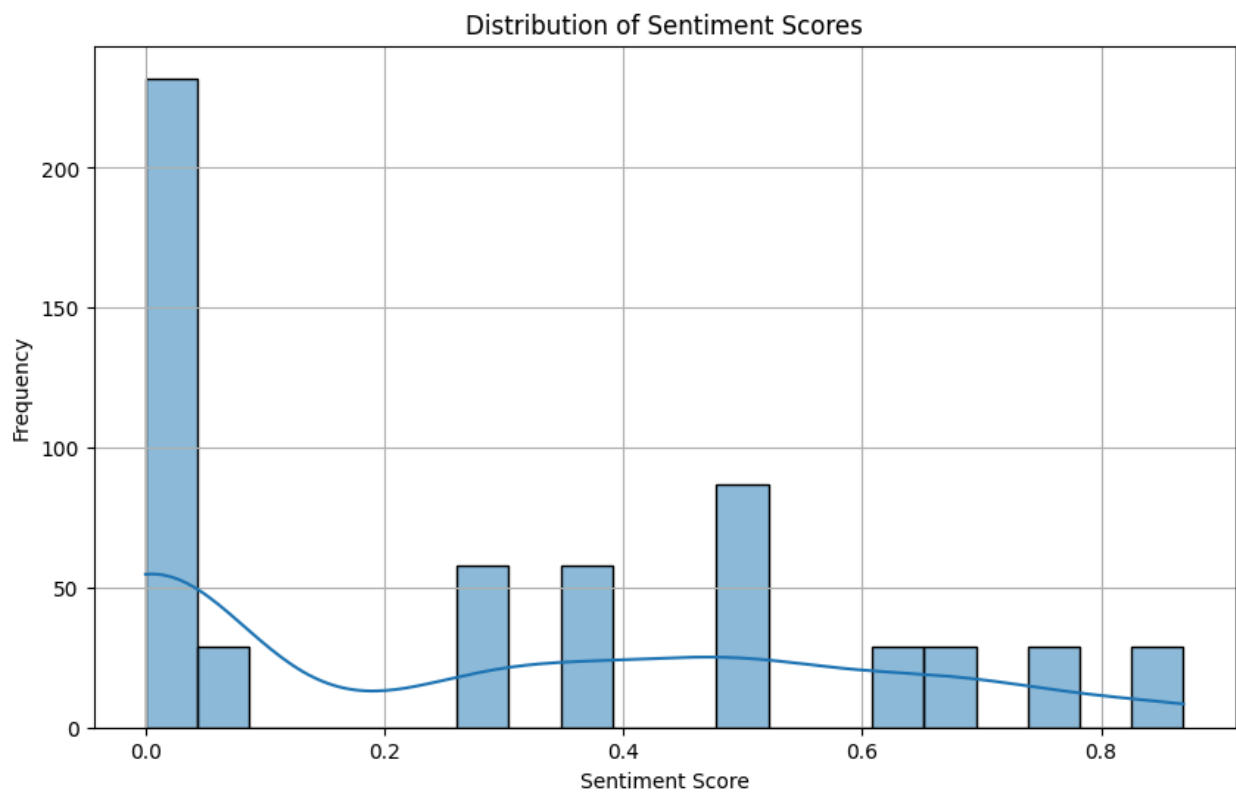
	sentiment_score
Basic Course	
B.SC. COMPUTER SCIENCE	0.287335
B.VOC FOOD TECHNOLOGY	0.287335
BACHELOR OF ARTS	0.287335
BACHELOR OF COMMERCE	0.287335
BACHELOR OF COMMERCE (ACCOUNTING AND FINANCE)	0.287335
BACHELOR OF COMMERCE (BANKING AND INSURANCE)	0.287335
BACHELOR OF MANAGEMENT STUDIES	0.287335
BACHELOR OF SCIENCE	0.287335
MA PSYCHOLOGY	0.287335
MSC ANALYTICAL CHEMISTRY	0.287335
MSC COMPUTER SCIENCE	0.287335
MSC DATA SCIENCE	0.287335
MSC INFORMATION TECHNOLOGY	0.287335
MSC MICROBIOLOGY	0.287335
MSC ORGANIC CHEMISTRY	0.287335
MSC PHYSICS	0.287335

dtype: float64

Sentiment Score Distribution (Descriptive Statistics):

sentiment_score	
count	580.000000
mean	0.287335
std	0.289406
min	0.000000
25%	0.000000
50%	0.273200
75%	0.498075
max	0.868900

dtype: float64



Questions with Lowest Average Sentiment Scores:

	sentiment_score
Questions	
Fairness of the internal evaluation process by the teachers.	0.0
How much of the syllabus was covered in the class?	0.0
Teachers inform you about your expected competencies, course outcomes and program\noutcomes.	0.0
The institute/ teachers use student-centric methods, such as experiential learning, participative learning and problem-solving methodologies for enhancing learning experiences.	0.0
The teachers illustrate the concepts through examples and applications.	0.0

dtype: float64

Questions with Highest Average Sentiment Scores:

	sentiment_score
Questions	
Teachers encourage you to participate in extracurricular activities.	0.5106
The teacher's approach to teaching can best be described as	0.6369
The institution makes effort to engage students in the monitoring, review and continuous quality improvement of the teaching-learning process.	0.6597
The teachers identify your strengths and encourage you to provide the proper level of challenges.	0.7430
The institute takes an active interest in promoting internships, student exchange, field visit opportunities for students.	0.8689

dtype: float64

Extract key themes and suggestions

```
In [ ]: import re
from nltk.corpus import stopwords
from nltk.tokenize import word_tokenize
from sklearn.feature_extraction.text import TfidfVectorizer
import nltk

try:
    nltk.data.find('tokenizers/punkt')
except LookupError:
```

```

nltk.download('punkt')
try:
    nltk.data.find('corpora/stopwords')
except LookupError:
    nltk.download('stopwords')
try:
    nltk.data.find('tokenizers/punkt_tab')
except LookupError:
    nltk.download('punkt_tab')

stop_words = set(stopwords.words('english'))

def preprocess_text(text):
    text = text.lower()
    text = re.sub(r'^\w\s', '', text)
    tokens = word_tokenize(text)
    tokens = [word for word in tokens if word not in stop_words]
    return ' '.join(tokens)

df_cleaned['cleaned_questions'] = df_cleaned['Questions'].apply(preprocess_text)

display(df_cleaned[['Questions', 'cleaned_questions']].head())

```

	Questions	cleaned_questions
0	How much of the syllabus was covered in the cl...	much syllabus covered class
1	How well did the teachers prepare for the clas...	well teachers prepare classes
2	How well were the teachers able to communicate?	well teachers able communicate
3	The teacher's approach to teaching can best be...	teachers approach teaching best described
4	Fairness of the internal evaluation process by...	fairness internal evaluation process teachers

```

In [ ]: tfidf_vectorizer = TfidfVectorizer(max_features=1000)
tfidf_matrix = tfidf_vectorizer.fit_transform(df_cleaned['cleaned_questions'])

print("Shape of TF-IDF matrix:", tfidf_matrix.shape)

```

Shape of TF-IDF matrix: (580, 111)

```

In [ ]: from sklearn.cluster import KMeans

num_clusters = 5
kmeans = KMeans(n_clusters=num_clusters, random_state=42, n_init=10)
clusters = kmeans.fit_predict(tfidf_matrix)

df_cleaned['cluster_label'] = clusters

```

```

print(f"\nTop terms per cluster (K={num_clusters}):")
order_centroids = kmeans.cluster_centers_.argsort()[:, :-1]
terms = tfidf_vectorizer.get_feature_names_out()

for i in range(num_clusters):
    print(f"Cluster {i}:")
    top_terms = [terms[ind] for ind in order_centroids[i, :10]]
    print(f"  Top terms: {' '.join(top_terms)}")

    print("  Sample Questions:")
    sample_questions = df_cleaned[df_cleaned['cluster_label'] == i]['Questions']
    for q in sample_questions:
        print(f"    - {q}")
    print("-" * 30)

cluster_sentiment = df_cleaned.groupby('cluster_label')['sentiment_score'].mean()
print("\nAverage Sentiment Score by Cluster:")
display(cluster_sentiment)

```

Top terms per cluster (K=5):

Cluster 0:

Top terms: identify, discussed, performance, assignments, class, much, syllabus, covered, weaknesses, help

Sample Questions:

- Teachers are able to identify your weaknesses and help you to overcome them.
- How much of the syllabus was covered in the class?
- Your mentor does a necessary follow-up with an assigned task to you.

Cluster 1:

Top terms: learning, skills, opportunities, institute, learn, provides, multiple, grow, institution, internships

Sample Questions:

- Efforts are made by the institute/ teachers to inculcate soft skills, life skills and employability skills to make you ready for the world of work.
- The institute takes an active interest in promoting internships, student exchange, field visit opportunities for students.
- The institute/ teachers use student-centric methods, such as experiential learning, participative learning and problem-solving methodologies for enhancing learning experiences.

Cluster 2:

Top terms: teaching, best, approach, described, mentoring, social, emotional, cognitive, facilitates, growth

Sample Questions:

- The teaching and mentoring process in your institution facilitates you in cognitive, social and emotional growth.
- The teacher's approach to teaching can best be described as
- What percentage of teachers use ICT tools such as LCD projectors, Multimedia, etc. while teaching?

Cluster 3:

Top terms: well, teachers, outcomes, communicate, prepare, classes, able, extracurricular, participate, activities

Sample Questions:

- Teachers encourage you to participate in extracurricular activities.
- How well did the teachers prepare for the classes?
- Teachers inform you about your expected competencies, course outcomes and program outcomes.

Cluster 4:

Top terms: process, quality, teachinglearning, fairness, evaluation, internal, overall, good, institute, makes

Sample Questions:

- The institution makes effort to engage students in the monitoring, review and continuous quality improvement of the teaching-learning process.
 - Fairness of the internal evaluation process by the teachers.
 - The overall quality of the teaching-learning process in your institute is very good.
-

Average Sentiment Score by Cluster:

cluster_label	sentiment_score
1	0.402975
4	0.384133
2	0.376933
3	0.211400
0	0.158920

dtype: float64

Visualize findings

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

plt.figure(figsize=(10, 6))
sns.barplot(x=cluster_sentiment.index, y=cluster_sentiment.values, palette='vivid')
plt.title('Average Sentiment Score by Cluster')
plt.xlabel('Cluster Label')
plt.ylabel('Average Sentiment Score')
plt.xticks(rotation=0)
plt.grid(axis='y')
plt.show()

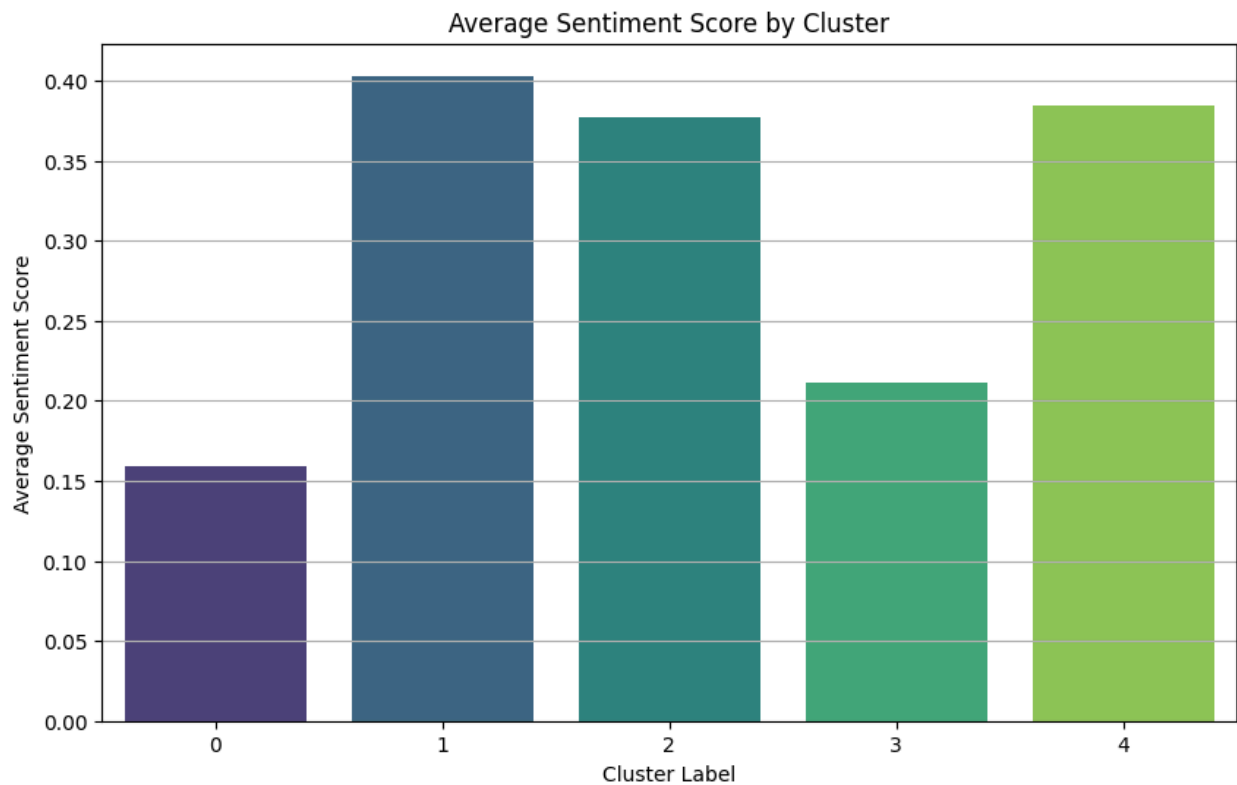
top_10_questions = question_sentiment.tail(10)
bottom_10_questions = question_sentiment.head(10)
combined_questions = pd.concat([bottom_10_questions, top_10_questions])

plt.figure(figsize=(12, 8))
sns.barplot(x=combined_questions.values, y=combined_questions.index, palette='vivid')
plt.title('Average Sentiment Score for Highest and Lowest Rated Questions')
plt.xlabel('Average Sentiment Score')
plt.ylabel('Question')
plt.grid(axis='x')
plt.show()
```

/tmp/ipython-input-42-2510660229.py:5: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `x` variable to `hue` and set `legend=False` for the same effect.

```
sns.barplot(x=cluster_sentiment.index, y=cluster_sentiment.values, palette='vivid', hue=cluster_sentiment.index, legend=False)
```



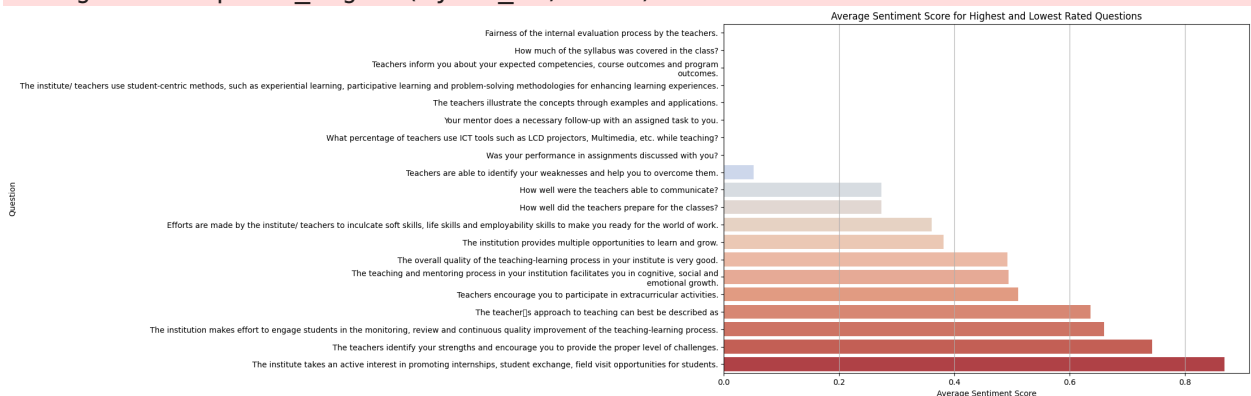
```
/tmp/ipython-input-42-2510660229.py:18: FutureWarning:
```

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `y` variable to `hue` and set `legend=False` for the same effect.

```
sns.barplot(x=combined_questions.values, y=combined_questions.index, palette='coolwarm')
```

```
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 146 (\x92) missing from font(s) DejaVu Sans.
```

```
fig.canvas.print_figure(bytes_io, **kw)
```



Summarize insights and recommendations

```
In [ ]: print("--- Overall Sentiment ---")
print(f"The overall average sentiment score is: {df_cleaned['sentiment_score']}
```



```

print("This indicates a generally positive, but not overwhelmingly enthusiastic sentiment overall.")

print("\n--- Sentiment by Course and Basic Course ---")
print("Average sentiment scores are relatively consistent across different Courses, indicating a balanced view of the institute's offerings.")
print("This suggests that satisfaction levels, based on these survey questions, are fairly uniform across the board.")

print("\n--- Sentiment Distribution ---")
print("The distribution of sentiment scores shows a range from negative/neutral to positive, with a slight skew towards the positive end.")
print("A notable number of responses are neutral or slightly positive, with fewer strongly negative responses.")

print("\n--- Sentiment by Cluster and Thematic Areas ---")
print("Analyzing sentiment by cluster, related to the identified themes:")
display(cluster_sentiment)
print("\nCluster 1 (highest sentiment) relates to the institute's efforts in providing quality education and resources.")
print("Cluster 4 and 2 also show relatively high sentiment, relating to overall satisfaction and teacher quality.")
print("Cluster 3 and 0 show lower sentiment, related to teacher communication, preparation, and student-centric methods.")

print("\n--- Sentiment for Highest and Lowest Rated Questions ---")
print("Questions with the highest sentiment highlight areas of strength:")
display(top_10_questions)
print("\nThese include the institute's active interest in internships, teacher engagement, and overall quality.")
print("Questions with the lowest sentiment highlight areas needing improvement:")
display(bottom_10_questions)
print("\nThese include fairness of internal evaluation, syllabus coverage, teacher communication, and student-centric methods.")

print("\n--- Actionable Insights and Recommendations ---")
print("Based on the analysis, here are some actionable insights and recommendations for improvement:")

print("\nAreas of Strength to Leverage:")
print("- Internships and Opportunities: The high sentiment around internships, indicating a strong focus on practical learning.")
print("- Teacher Engagement and Support (Identifying Strengths): Teachers identified as a key strength, suggesting a supportive environment for faculty.")
print("- Overall Quality and Teacher Approach: The generally positive sentiment towards the institute's overall quality and teacher approach.")

print("\nAreas for Improvement:")
print("- Fairness of Internal Evaluation and Syllabus Coverage: These questions received lower sentiment, suggesting a need for more transparent and relevant evaluation.")
print("- Teacher Communication and Preparation: Lower sentiment regarding communication and preparation, indicating a need for better support and resources for faculty.")
print("- Student-Centric Methods and Concept Illustration: Low sentiment suggests a need for more interactive and illustrative teaching methods.")
print("- Mentor Follow-up and Assignment Discussion: Low sentiment in these areas suggests a need for more structured follow-up and discussion.")
print("- Use of ICT Tools: Low sentiment regarding the percentage of teachers using ICT tools, suggesting a need for more digital integration.")
print("- Informing about Outcomes: Low sentiment regarding teachers informing students about outcomes, suggesting a need for better communication of results.")

print("\nGeneral Recommendations:")
print("- Gather More Detailed Feedback: The current 'Questions' column is limited, suggesting a need for more granular feedback collection.")
print("- Follow-up on Low-Sentiment Areas: Conduct targeted surveys or focus groups on areas with lower sentiment to understand the root causes and implement improvements.")

```

--- Overall Sentiment ---

The overall average sentiment score is: 0.2873

This indicates a generally positive, but not overwhelmingly enthusiastic, sentiment among students.

--- Sentiment by Course and Basic Course ---

Average sentiment scores are relatively consistent across different Course Names and Basic Courses.

This suggests that satisfaction levels, based on these survey questions, do not significantly vary by academic program.

--- Sentiment Distribution ---

The distribution of sentiment scores shows a range from negative/neutral (0.0) to highly positive (0.8689).

A notable number of responses are neutral or slightly positive, with fewer strongly positive responses.

--- Sentiment by Cluster and Thematic Areas ---

Analyzing sentiment by cluster, related to the identified themes:

sentiment_score	
cluster_label	
1	0.402975
4	0.384133
2	0.376933
3	0.211400
0	0.158920

dtype: float64

Cluster 1 (highest sentiment) relates to the institute's efforts in providing learning opportunities, skill development, internships, and student-centric methods. This appears to be a strong area.

Cluster 4 and 2 also show relatively high sentiment, relating to overall quality, evaluation fairness, teacher approach, and mentoring.

Cluster 3 and 0 show lower sentiment, related to teacher communication, preparation, informing about outcomes, teacher support, syllabus coverage, and assignment discussions. These are potential areas for improvement.

--- Sentiment for Highest and Lowest Rated Questions ---

Questions with the highest sentiment highlight areas of strength:

	sentiment_score
Questions	
How well did the teachers prepare for the classes?	0.2732
Efforts are made by the institute/ teachers to inculcate soft skills, life skills and employability skills to make you ready for the world of work.	0.3612
The institution provides multiple opportunities to learn and grow.	0.3818
The overall quality of the teaching-learning process in your institute is very good.	0.4927
The teaching and mentoring process in your institution facilitates you in cognitive, social and\nemotional growth.	0.4939
Teachers encourage you to participate in extracurricular activities.	0.5106
The teacher's approach to teaching can best be described as	0.6369
The institution makes effort to engage students in the monitoring, review and continuous quality improvement of the teaching-learning process.	0.6597
The teachers identify your strengths and encourage you to provide the proper level of challenges.	0.7430
The institute takes an active interest in promoting internships, student exchange, field visit opportunities for students.	0.8689

dtype: float64

These include the institute's active interest in internships, teachers identifying strengths, engaging students in quality improvement, and positive teacher approaches/encouragement.

Questions with the lowest sentiment highlight areas needing improvement:

	sentiment_score
Questions	
Fairness of the internal evaluation process by the teachers.	0.0000
How much of the syllabus was covered in the class?	0.0000
Teachers inform you about your expected competencies, course outcomes and program\noutcomes.	0.0000
The institute/ teachers use student-centric methods, such as experiential learning, participative learning and problem-solving methodologies for enhancing learning experiences.	0.0000
The teachers illustrate the concepts through examples and applications.	0.0000
Your mentor does a necessary follow-up with an assigned task to you.	0.0000
What percentage of teachers use ICT tools such as LCD projectors, Multimedia, etc. while teaching?	0.0000
Was your performance in assignments discussed with you?	0.0000
Teachers are able to identify your weaknesses and help you to overcome them.	0.0516
How well were the teachers able to communicate?	0.2732

dtype: float64

These include fairness of internal evaluation, syllabus coverage, teachers informing about outcomes, use of student-centric methods, teacher illustration of concepts, mentor follow-up, use of ICT tools, and discussion of assignment performance.

--- Actionable Insights and Recommendations ---

Based on the analysis, here are some actionable insights and recommendations:

Areas of Strength to Leverage:

- Internships and Opportunities: The high sentiment around internships, student exchange, and field visits suggests these are highly valued. Recommendation: Continue and expand programs promoting these opportunities.
- Teacher Engagement and Support (Identifying Strengths): Teachers identifying strengths is perceived positively. Recommendation: Encourage teachers to actively provide personalized feedback on student strengths and areas for growth.
- Overall Quality and Teacher Approach: The generally positive sentiment towards overall quality and teacher approach/mentoring is a good sign. Recommendation: Maintain current standards and share best practices among faculty.

Areas for Improvement:

- Fairness of Internal Evaluation and Syllabus Coverage: These questions received the lowest sentiment. Recommendation: Review and potentially revise internal evaluation processes for clarity and perceived fairness. Ensure syllabus is consistently covered across all classes and communicated effectively.
- Teacher Communication and Preparation: Lower sentiment regarding communication and preparation for classes. Recommendation: Provide training and support for teachers on effective communication strategies and methods for preparing engaging classes.
- Student-Centric Methods and Concept Illustration: Low sentiment suggests these teaching methods may not be consistently applied or effective. Recommendation: Offer professional development for teachers on incorporating more student-centric, experiential, and problem-solving methodologies, and on illustrating concepts with relevant examples.
- Mentor Follow-up and Assignment Discussion: Low sentiment in these areas. Recommendation: Implement guidelines or training for mentors on consistent follow-up. Ensure teachers regularly discuss assignment performance and feedback with students.
- Use of ICT Tools: Low sentiment regarding the percentage of teachers using ICT tools. Recommendation: Invest in and promote the use of relevant ICT tools in teaching. Provide training and support for teachers to effectively integrate technology into their classes.
- Informing about Outcomes: Low sentiment regarding teachers informing about expected competencies, course outcomes, and program outcomes. Recommendation: Develop clear guidelines for teachers to explicitly communicate learning objectives and outcomes at the beginning of courses and throughout the semester.

General Recommendations:

- Gather More Detailed Feedback: The current 'Questions' column is limited. Implement mechanisms for collecting more detailed, open-ended feedback on specific aspects of courses, teaching, and institute services.
- Follow-up on Low-Sentiment Areas: Conduct targeted surveys or focus groups in areas identified with low sentiment to understand the root causes of dissatisfaction in more detail.

In []: