Student_Feedback_Analysis_—_Task_3

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1 Student Feedback Analysis — Task 3

Author: siddhi kinnera
Dataset: student_feedback.csv **1001 responses**

---

[66]:
```
import pandas as pd

# Read uploaded file (replace filename if different)
df = pd.read_csv("student_feedback.csv")
# Show first 5 rows
df.head()
```

[66]:

	Unnamed:0	StudentID	Well versedwith thesubject	\
0	0	340	5	
1	1	253	6	
2	2	680	7	
3	3	806	9	
4	4	632	8	

	Explains concepts in an understandable way	Use of presentations	\
0	2	7	
1	5	8	
2	7	6	
3	6	7	
4	10	8	

	Degree of difficulty of assignments	Solves doubts willingly	\
0	6	9	
1	6	2	
2	5	4	
3	1	5	
4	4	6	

	Structuring of the course	\
0	2	

1	1
2	2
3	9
4	6

Provides support for students going above and beyond

0	1
1	2
2	3
3	4
4	9

Course recommendation based on relevance

0	8
1	9
2	1
3	6
4	9

[67]:
```
# Run once in Colab
%pip -q install pandas matplotlib seaborn nltk vaderSentiment wordcloud textblobopenpyxl
import nltk
nltk.download('vader_lexicon')
nltk.download('punkt')     #for TextBlob
```

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

[67]: True

[68]:
```
import pandas as pd
from google.colab import files, drive
import os

# ---------- A) Upload local file ----------
# Uncomment if you want to upload manually
# uploaded = files.upload()
# fname = next(iter(uploaded))  # picks the first uploaded file
# df = pd.read_csv(fname) if fname.lower().endswith('.csv') else pd.read_excel(fname)

# ---------- B) From Google Drive ----------
# Uncomment if using Google Drive
# drive.mount('/content/drive')
# path = "/content/drive/MyDrive/student_feedback.csv"  # update path if needed
```

```
# df = pd.read_csv(path) if path.lower().endswith('.csv') else pd.
  read_excel(path)

# ---------- C) Default: Load dataset from working directory ----------
df = pd.read_csv("student_feedback.csv")
# Drop redundant index column if present
if "Unnamed: 0" in df.columns:
    df = df.drop(columns=["Unnamed: 0"])

print("Loaded rows:", len(df))
df.head()
```

```
Loaded rows: 1001
```

[68]:

	StudentID	Well versed with the subject	Explains concepts in an understandable way	Use of presentations	Degree of difficulty of assignments	Solves doubts willingly	Structuring of the course	Provides support for students going above and beyond
0	340	5	2	7	6	9	2	1
1	253	6	5	8	6	2	1	2
2	680	7	7	6	5	4	2	3
3	806	9	6	7	1	5	9	
4	632	8	10	8	4	6	6	

3	4
4	9

	Course recommendation based on relevance
0	8
1	9
2	1
3	6
4	9

[69]:
```
# Quick inspections
print("Columns:", df.columns.tolist())
print("\nSample rows:")
display(df.head(8))
print("\nInfo:")
df.info()
print("\nMissing values per column:")
print(df.isna().sum())
print("\nBasic statistics:")
display(df.describe())
```

Columns: ['Student ID', 'Well versed with the subject', 'Explains concepts in an understandable way', 'Use of presentations', 'Degree of difficulty of assignments', 'Solves doubts willingly', 'Structuring of the course', 'Provides support for students going above and beyond', 'Course recommendation based on relevance']

Sample rows:

	Student ID	Well versed with the subject	\
0	340	5	
1	253	6	
2	680	7	
3	806	9	
4	632	8	
5	832	7	
6	772	9	
7	961	9	

	Explains concepts in an understandable way	Use of presentations	\
0	2	7	
1	5	8	
2	7	6	
3	6	7	

4	10	8
5	2	7
6	3	5
7	8	7

	Degree of difficulty of assignments	Solves doubts willingly	\
0	6	9	
1	6	2	
2	5	4	
3	1	5	
4	4	6	
5	8	3	
6	2	10	
7	4	4	

	Structuring of the course	\
0	2	
1	1	
2	2	
3	9	
4	6	
5	5	
6	3	
7	3	

	Provides support for students going above and beyond
0	1
1	2
2	3
3	4
4	9
5	1
6	8
7	3

	Course recommendation based on relevance
0	8
1	9
2	1
3	6
4	9
5	4
6	1
7	10

Info:
<class 'pandas.core.frame.DataFrame'>

RangeIndex: 1001 entries, 0 to 1000
Data columns (total 9 columns):

#	Column	Non-Null Count	Dtype
0	StudentID	1001 non-null	int64
1	Wellversed with the subject	1001 non-null	int64
2	Explains concepts in a understandable way	1001 non-null	int64
3	Use of presentations	1001 non-null	int64
4	Degree of difficulty of assignments	1001 non-null	int64
5	Solves doubts willingly	1001 non-null	int64
6	Structuring of the course	1001 non-null	int64
7	Provides support for students going above and beyond	1001 non-null	int64
8	Course recommendation based on relevance	1001 non-null	int64

dtypes: int64(9)
memory usage: 70.5 KB

Missing values per column:

StudentID	0
Wellversed with the subject	0
Explains concepts in an understandable way	0
Use of presentations	0
Degree of difficulty of assignments	0
Solves doubts willingly	0
Structuring of the course	0
Provides support for students going above and beyond	0
Course recommendation based on relevance	0

dtype: int64

Basic statistics:

	StudentID	Well versed with the subject \
count	1001.000000	1001.000000
mean	500.000000	7.497502
std	289.108111	[illegible]
min	0.000000	5.000000
25%	250.000000	6.000000
50%	500.000000	8.000000
75%	750.000000	9.000000
max	1000.000000	10.000000

	Explains concepts in an understandable way	Use of presentations \
count	1001.000000	1001.000000
mean	6.081918	5.942058
std	2.597168	1.415853
min	2.000000	4.000000
25%	4.000000	5.000000
50%	6.000000	6.000000
75%	8.000000	7.000000

```
max                                    10.000000                8.000000

       Degree of difficulty of assignments  Solves doubts willingly  \
count                          1001.000000              1001.000000
mean                              5.430569                 5.474525
std                               2.869046                 2.874648
min                               1.000000                 1.000000
25%                               3.000000                 3.000000
50%                               5.000000                 6.000000
75%                               8.000000                 8.000000
max                              10.000000                10.000000

       Structuring of the course  \
count                1001.000000
mean                    5.636364
std                     2.920212
min                     1.000000
25%                     3.000000
50%                     6.000000
75%                     8.000000
max                    10.000000

       Provides support for students going above and beyond  \
count                                        1001.000000
mean                                            5.662338
std                                             2.891690
min                                             1.000000
25%                                             3.000000
50%                                             6.000000
75%                                             8.000000
max                                            10.000000

       Course recommendation based on relevance
count                               1001.000000
mean                                   5.598402
std                                    2.886617
min                                    1.000000
25%                                    3.000000
50%                                    6.000000
75%                                    8.000000
max                                   10.000000
```

[70]:
```python
# Standardize column names (strip spaces)
df = df.rename(columns=lambda c: str(c).strip())
# Drop extra index column if it still exists
if "Unnamed: 0" in df.columns:
```

```
    df = df.drop(columns=["Unnamed: 0"])

# Verify required structure
print("Columns after cleaning:", df.columns.tolist())
# Ensure all columns are numeric
numeric_cols = df.columns.drop("Student ID") if "Student ID" in df.columns else
  df.columns
for col in numeric_cols:
    df[col] = pd.to_numeric(df[col], errors="coerce")

# Drop rows with any missing numeric values
df = df.dropna(subset=numeric_cols).reset_index(drop=True)
print("After cleaning rows:", len(df))
df.head()
```

```
Columns after cleaning: ['Student ID', 'Well versed with the subject', 'Explains
concepts in an understandable way', 'Use of presentations', 'Degree of
difficulty of assignments', 'Solves doubts willingly', 'Structuring of the
course', 'Provides support for students going above and beyond', 'Course
recommendation based on relevance']
After cleaning rows: 1001
```

[70]:

	StudentID	Well versed with the subject	\
0	340	5	
1	253	6	
2	680	7	
3	806	9	
4	632	8	

	Explains concepts in an understandable way	Use of presentations	\
0	2	7	
1	5	8	
2	7	6	
3	6	7	
4	10	8	

	Degree of difficulty of assignments	Solves doubts willingly	\
0	6	9	
1	6	2	
2	5	4	
3	1	5	
4	4	6	

	Structuring of the course	\
0	2	

```
1                                1
2                                2
3                                9
4                                6

    Provides support for students going above and beyond \
0                                                       1
1                                                       2
2                                                       3
3                                                       4
4                                                       9

    Course recommendation based on relevance
0                                                       8
1                                                       9
2                                                       1
3                                                       6
4                                                       9
```

[71]:
```
print("Total responses:", len(df))

print("\nRatings summary (all questions):")
display(df.describe().round(2))
print("\nAverage rating per question:")
display(df.mean().round(2).sort_values(ascending=False))
```

```
Total responses: 1001

Ratings summary (all questions):
       Student ID  Well versed with the subject \
cou       1001.00                       1001.00
nt         500.00                          7.50
mea        289.11                          1.69
n            0.00                          5.00
std        250.00                          6.00
min        500.00                          8.00
25%        750.00                          9.00
50%       1000.00                         10.00
75%
max    Explains concepts in an understandable way  Use of presentations \
count                                     1001.00                1001.00
mean                                         6.08                   5.94
std                                          2.60                   1.42
min                                          2.00                   4.00
25%                                          4.00                   5.00
50%                                          6.00                   6.00
```

75%		8.00	10.00	Solves doubts willingly 7.00
max	Degree of difficulty of assignments			8.00 \
count		1001.00		1001.00
mean		5.43		5.47
std		2.87		2.87
min		1.00		1.00
25%		3.00		3.00
50%		5.00		6.00
75%		8.00		8.00
max		10.00		10.00
	Structuring of the course \			
count		1001.00		
mean		5.64		
std		2.92		
min		1.00		
25%		3.00		
50%		6.00		
75%		8.00		
max		10.00		
	Provides support for students going above and beyond \			
count			1001.00	
mean			5.66	
std			2.89	
min			1.00	
25%			3.00	
50%			6.00	
75%			8.00	
max			10.00	
	Course recommendation based on relevance			
count		1001.00		
mean		5.60		
std		2.89		
min		1.00		
25%		3.00		
50%		6.00		
75%		8.00		
max		10.00		

Average rating per question:

Student ID	500.00
Well versed with the subject	7.50
Explains concepts in an understandable way	6.08

```
Useofpresentations                                          5.9
Provides support for students going above and beyond        4
Structuring of the course                                   5.6
Courserecommendationbasedon relevance                       6
Solvesdoubts willingly                                      5.6
Degreeof difficulty ofassignments                           4
dtype: float64                                              5.6
                                                            0
                                                            5.4
                                                            7
                                                            5.4
                                                            3
```

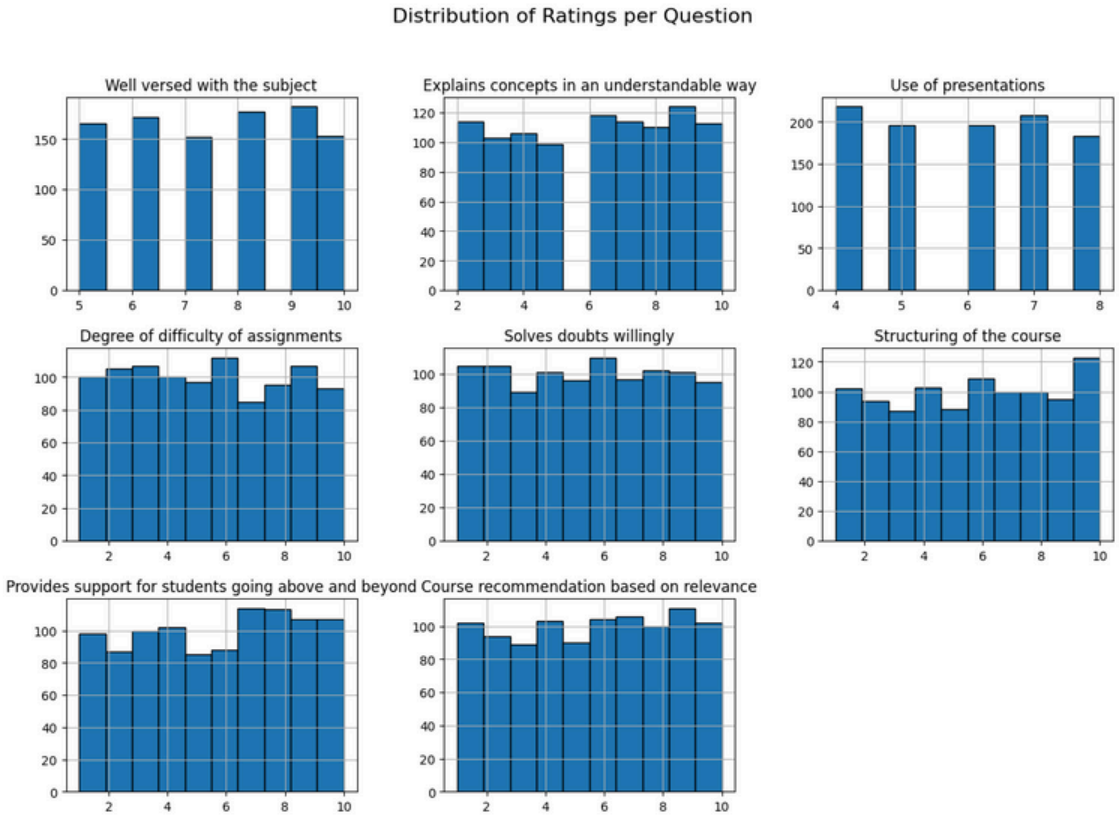
[72]:
```
# Calculate average score per question
avg_scores = df.mean().round(2).sort_values(ascending=False)
print("Average scores per question:")
display(avg_scores)
# Highlight strongest and weakest aspects
print("\nHighest rated aspect:", avg_scores.idxmax(), "→", avg_scores.max())
print("Lowest rated aspect:", avg_scores.idxmin(), "→", avg_scores.min())
```

```
Average scores per question:

StudentID                                                   500.00
Wellversed with the subject                                 7.50
Explainsconceptsin anunderstandableway                      6.08
Useofpresentations                                          5.94
Provides support for students going above and beyond        5.66
Structuring of the course                                   5.64
Courserecommendationbasedon relevance                       5.60
Solvesdoubts willingly                                      5.47
Degreeof difficulty ofassignments                           5.43
dtype: float64


Highest rated aspect: Student ID → 500.0
Lowest rated aspect: Degree of difficulty of assignments → 5.43
```

[73]:
```
import seaborn as sns
import matplotlib.pyplot as plt

# Plot distribution for each question
plt.figure(figsize=(12, 6))
df.drop(columns=["Student ID"], errors="ignore").hist(bins=10, figsize=(15,␣
↪10),edgecolor="black")
plt.suptitle("DistributionofRatingsperQuestion",fontsize=16)
plt.show()
# Or: average rating barplot per question
avg_scores = df.drop(columns=["Student ID"], errors="ignore").mean().round(2).
↪sort_values()
```

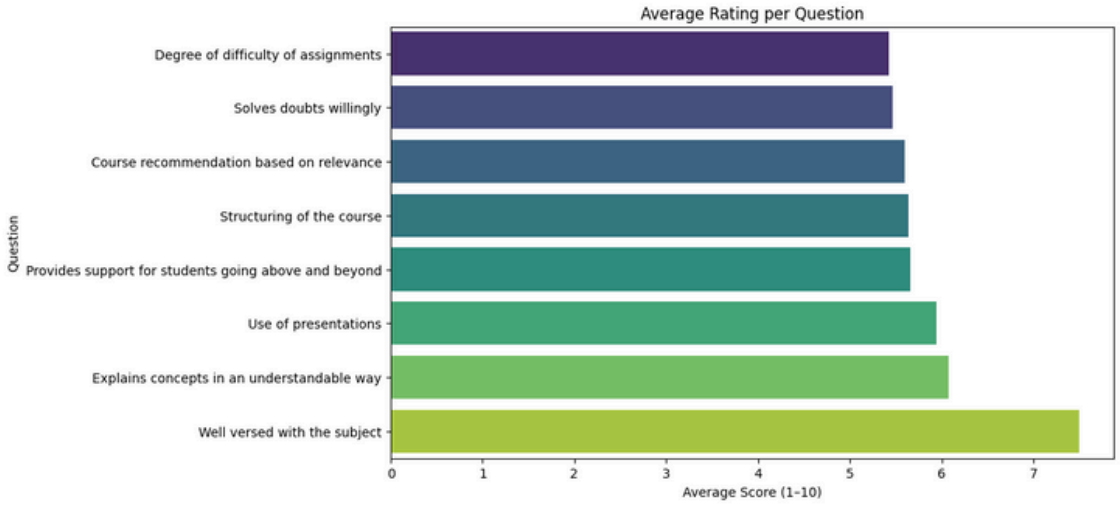
```
plt.figure(figsize=(10,6))
sns.barplot(x=avg_scores.values, y=avg_scores.index, palette="viridis")
plt.title("Average Rating per Question")
plt.xlabel("Average Score (1–10)")
plt.ylabel("Question")
plt.show()
```

<Figure size 1200x600 with 0 Axes>

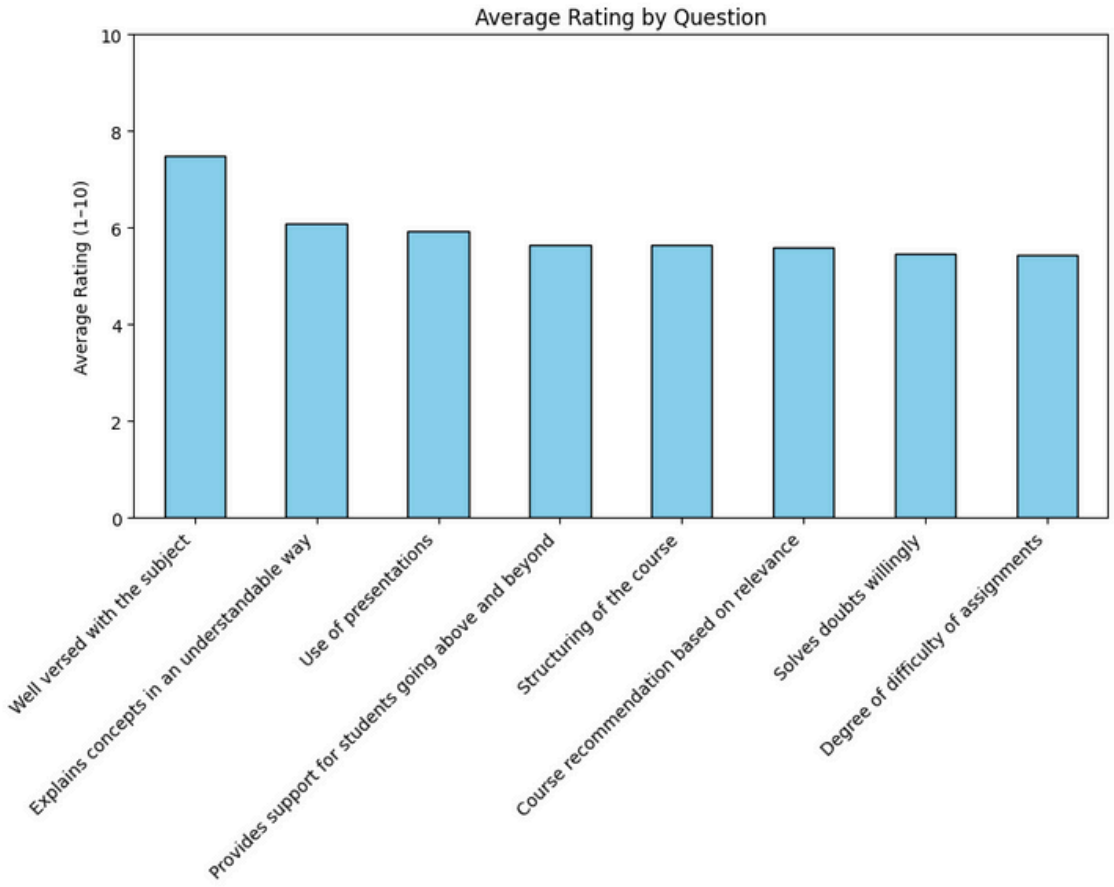


/tmp/ipython-input-2793561493.py:14: FutureWarning:
Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `y` variable to `hue` and set `legend=False` for the same effect.

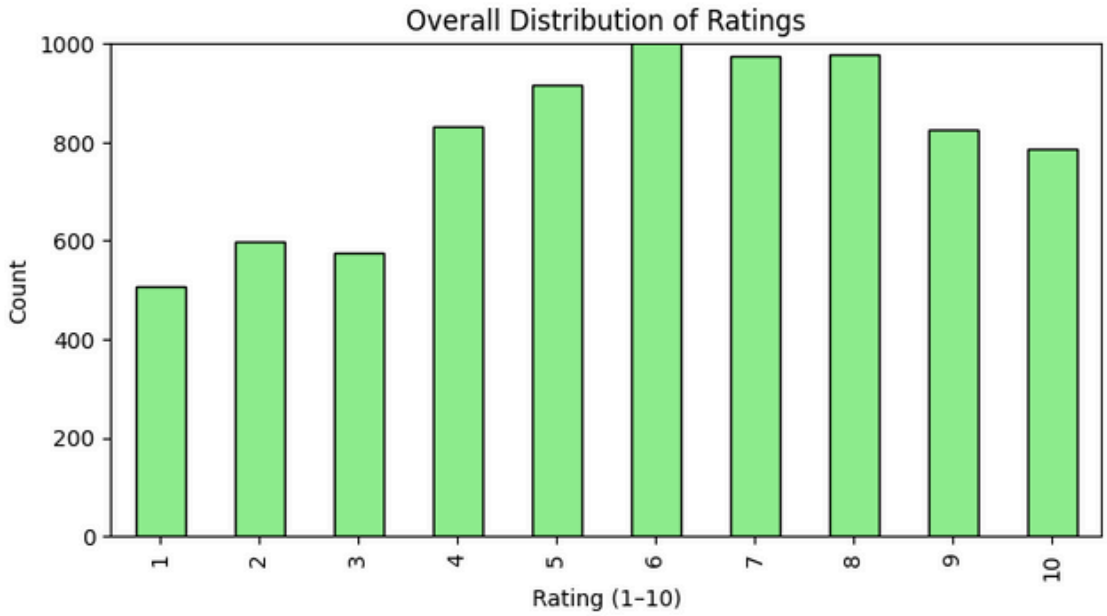
```
  sns.barplot(x=avg_scores.values, y=avg_scores.index, palette="viridis")
```



[74]:
```
import matplotlib.pyplot as plt

# Calculate average per question
avg_scores = df.drop(columns=["Student ID"], errors="ignore").mean().round(2).
  sort_values(ascending=False)

plt.figure(figsize=(10,5))
avg_scores.plot(kind="bar", color="skyblue", edgecolor="black")
plt.ylim(0, 10)
plt.ylabel("Average Rating (1–10)")
plt.title("Average Rating by Question")
plt.xticks(rotation=45, ha="right")
plt.show()
```



[75]:
```
import matplotlib.pyplot as plt

# Flatten all ratings (excluding Student ID if present)
all_ratings = df.drop(columns=["Student ID"], errors="ignore").values.flatten()
plt.figure(figsize=(8,4))
pd.Series(all_ratings).value_counts().sort_index().plot(kind="bar",␣
  ↪color="lightgreen",edgecolor="black")
plt.ylim(0,len(df))
plt.ylabel("Count")
plt.xlabel("Rating (1–10)")
plt.title("Overall Distribution of Ratings")
plt.show()
```

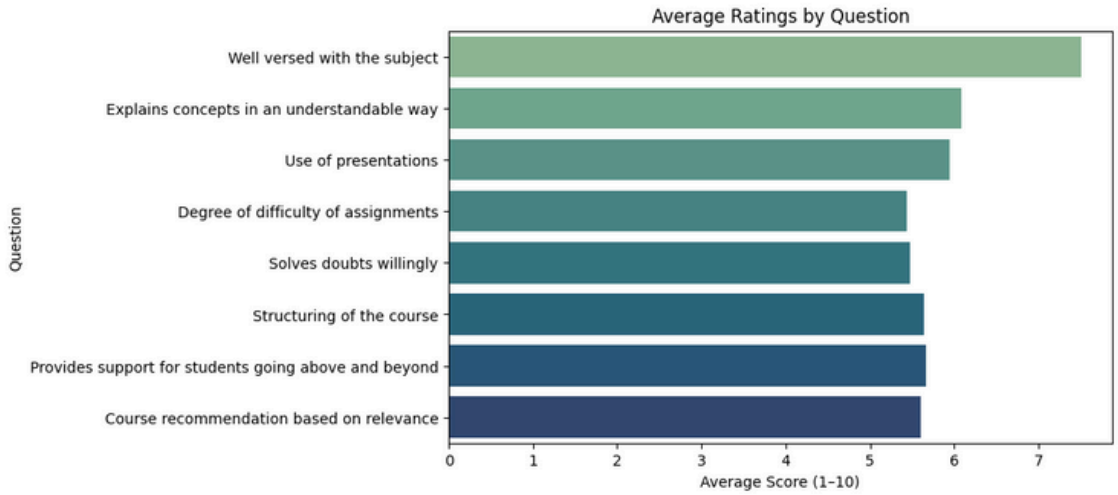


[76]:
```
import seaborn as sns
import matplotlib.pyplot as plt

# Average score per question
avg_scores = df.drop(columns=["Student ID"], errors="ignore").mean().round(2)

plt.figure(figsize=(8,5))
sns.barplot(x=avg_scores.values, y=avg_scores.index, palette="crest")
plt.title("Average Ratings by Question")
plt.xlabel("Average Score (1–10)")
plt.ylabel("Question")
plt.show()
```

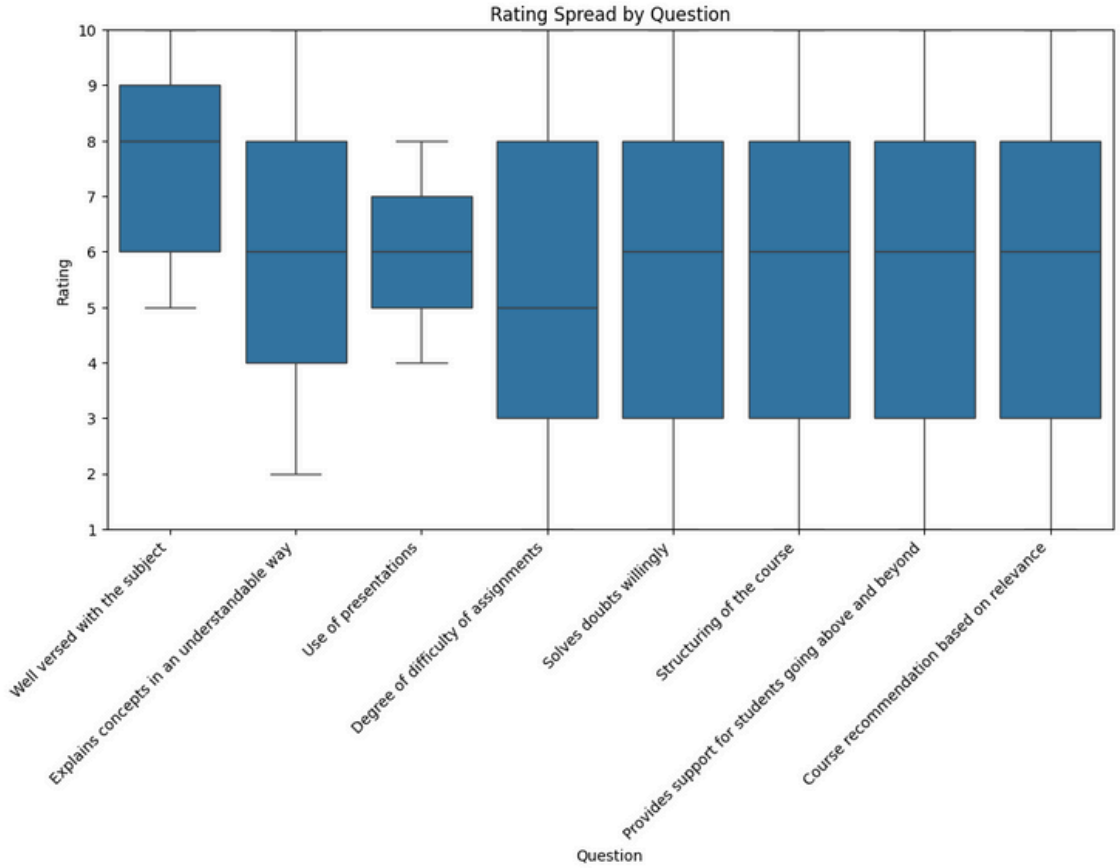
/tmp/ipython-input-965084220.py:8: FutureWarning:

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.

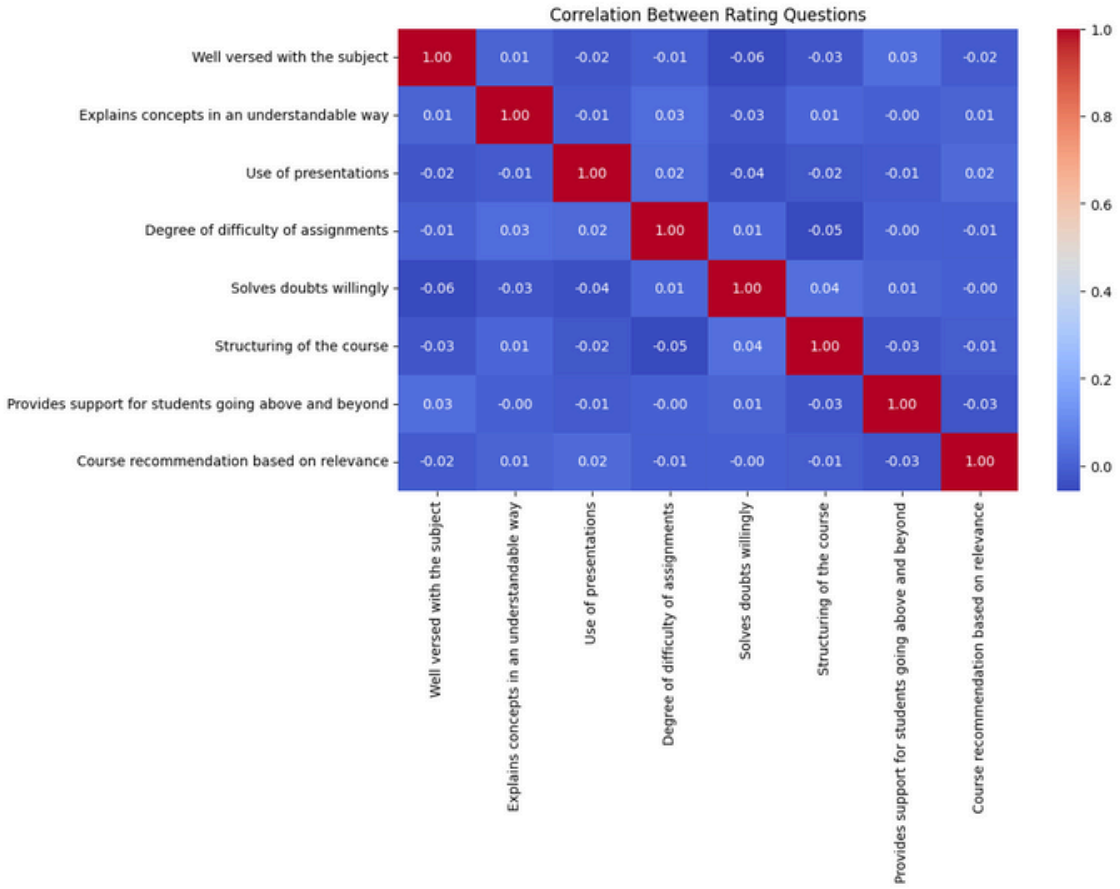
sns.barplot(x=avg_scores.values, y=avg_scores.index, palette="crest")



[77]:
```
import seaborn as sns
import matplotlib.pyplot as plt

# Melt the dataframe into long format (for boxplot per question)
df_melted = df.drop(columns=["Student ID"], errors="ignore").
  melt(var_name="Question", value_name="Rating")

plt.figure(figsize=(12,6))
sns.boxplot(x="Question", y="Rating", data=df_melted)
plt.title("Rating Spread by Question")
plt.ylim(1, 10)
plt.xticks(rotation=45, ha="right")
plt.show()
```



[78]:
```
import seaborn as sns
import matplotlib.pyplot as plt

# Correlation matrix (excluding Student ID if present)
corr = df.drop(columns=["Student ID"], errors="ignore").corr()
plt.figure(figsize=(10,6))
sns.heatmap(corr, annot=True, cmap="coolwarm", fmt=".2f")
plt.title("Correlation Between Rating Questions")
plt.show()
```



[79]:
```
# --- Summary: Average & response count per question ---
summary = df.drop(columns=["Student ID"], errors="ignore").
  agg(["mean","count"]).T
summary=summary.rename(columns={"mean":"avg_rating","count":"responses"})
display(summary.round(2))
# --- Simple rules for recommendations ---
recs = []
low_questions = summary[summary["avg_rating"] < 6].index.tolist()
high_questions = summary[summary["avg_rating"] > 8].index.tolist()
if low_questions:


    recs.append(f"Focus improvement efforts on the following low-rated areas
  (<6average):{','.join(low_questions)}.")
ifhigh_questions:
    recs.append(f"Maintain and highlight strengths in these high-rated areas
  (>8average):{','.join(high_questions)}.")
ifnotrecs:
```

```
    recs.append("Overall satisfaction appears stable — continue current␣
 ↪practices.")

print("\nRecommendations:")
for i, r in enumerate(recs, 1):
    print(f"{i}. {r}")
```

	avg_rating	responses
Well versed with the subject	7.50	1001.0
Explains concepts in an understandable way	6.08	1001.0
Use of presentations	5.94	1001.0
Degree of difficulty of assignments	5.43	1001.0
Solves doubts willingly	5.47	1001.0
Structuring of the course	5.64	1001.0
Provides support for students going above and b...	5.66	1001.0
Course recommendation based on relevance	5.60	1001.0

Recommendations:

1. Focus improvement efforts on the following low-rated areas (<6 average): Use of presentations, Degree of difficulty of assignments, Solves doubts willingly, Structuring of the course, Provides support for students going above and beyond, Course recommendation based on relevance.

[80]:
```
# --- Save cleaned dataset ---
df.to_csv("cleaned_feedback.csv", index=False)
df.to_excel("cleaned_feedback.xlsx", index=False)

print("✅ Cleaned data saved as 'cleaned_feedback.csv' and 'cleaned_feedback.
 ↪xlsx' in the working directory.")

# --- Optional: in Colab, enable direct download ---
# from google.colab import files
# files.download("cleaned_feedback.xlsx")
```

✅ Cleaned data saved as 'cleaned_feedback.csv' and 'cleaned_feedback.xlsx' in the working directory.

2 Project: Student Feedback Analysis — Task 3

Dataset: student_feedback.csv **1001 responses**

2.1 Keyfindings

1. **Overall average rating (across all questions): 5.92**
2. **Top 3 highest-rated questions:**
   - *Well versed with the subject* — **7.50**

- *Explains concepts in an understandable way* — **6.08**
- *Use of presentations* — **5.94**

3. **Bottom 3 questions (improvement areas):**
   - *Course recommendation based on relevance* — **5.60**
   - *Solves doubts willingly* — **5.47**
   - *Degree of difficulty of assignments* — **5.43**

4. **Strongest drivers of recommendation** (by correlation with **"Course recommendation based on relevance"**):
   - *Use of presentations* — r = 0.023
   - *Explains concepts in an understandable way* — r = 0.009
   - *Solves doubts willingly* — r = -0.001

5. **Rating distribution snapshot (all questions combined):**
   - **8–10:** 32.4%
   - **5–7:** 36.2% •
   1–4: 31.4%

2.2 Toprecommendations

1. **Improve low-rated aspects** (*recommendation relevance, doubt-solving, assignment difficulty*) with targeted actions (clearer rubrics, examples, support sessions).

2. **Double-down on strengths** (*subject knowledge, concept clarity, presentations*) and share best practices across faculty.

3. Since correlation is weak, **focus on holistic improvements** (communication, mentoring, interactive teaching) to lift overall recommendation.

4. **Monitor progress**: re-measure after adjustments; track month-over-month shifts in average and distribution.

2.3 Deliverables

- cleaned_feedback.csv/cleaned_feedback.xlsx
- question_averages.csv (mean rating per question)
- overall_rating_distribution.csv (count of each score 1–10 across all questions)

- correlation_matrix.csv (Pearson r between questions)

- PNG charts:
  - hist_per_question.png (distributions per question)
  - avg_by_question.png (bar chart of averages)
  - boxplots_by_question.png (spread by question)
  - correlation_heatmap.png (relationship between questions)