College Event Feedback Analysis — Internship Project

This notebook walks you **step-by-step** through the full workflow:

1. Setup & installations
2. Load the CSV (from Google Form or the sample file)
3. Clean & transform data
4. Exploratory analysis (ratings, top events, trends)
5. Sentiment analysis on comments (TextBlob + VADER)
6. Insights & recommendations export

In [3]:
```
!pip -q install pandas numpy matplotlib seaborn textblob vaderSentiment wordcl

import textblob
textblob.download_corpora.download_all()
```

```
[nltk_data] Downloading package brown to /root/nltk_data...
[nltk_data]   Unzipping corpora/brown.zip.
[nltk_data] Downloading package punkt_tab to /root/nltk_data...
[nltk_data]   Unzipping tokenizers/punkt_tab.zip.
[nltk_data] Downloading package wordnet to /root/nltk_data...
[nltk_data] Downloading package averaged_perceptron_tagger_eng to
[nltk_data]     /root/nltk_data...
[nltk_data]   Unzipping taggers/averaged_perceptron_tagger_eng.zip.
[nltk_data] Downloading package conll2000 to /root/nltk_data...
[nltk_data]   Unzipping corpora/conll2000.zip.
[nltk_data] Downloading package movie_reviews to /root/nltk_data...
[nltk_data]   Unzipping corpora/movie_reviews.zip.
```

1) Load your data

In [5]:
```
import pandas as pd
from io import StringIO
from google.colab import files

uploaded = files.upload()  # Choose your CSV
csv_name = next(iter(uploaded))  # first uploaded file
data = pd.read_csv(StringIO(uploaded[csv_name].decode('utf-8')))
data.head()
```

```
Browse...
```

Upload widget is only available when the cell has been executed in the current browser session. Please rerun this cell to enable.

```
Saving sample_student_feedback.csv to sample_student_feedback.csv
```

Out[5]:

	Timestamp	Event Name	Department	Event Type	Rating	Would Recommend	Commer
0	2025-07-04 13:00:00	Alumni Talk Series	Mechanical	expo	4	Yes	Gre organizatic and helpf volunteer
1	2025-02-04 15:00:00	Workshop: Python for Data	MBA	workshop	5	Yes	Loved th speaker ar the Q& sessio
2	2025-03-18 12:00:00	Tech Fest 2025	ECE	expo	4	Yes	Loved th speaker ar the Q& sessio
3	2025-06-10 16:00:00	Workshop: Python for Data	Biotech	workshop	4	Yes	Gre organizatic and helpf volunteer
4	2025-04-12 18:00:00	Cultural Night	CSE	expo	2	Yes	Sessic started lat neec better tim manage

In [6]:
```
# OPTIONAL: Load from Google Drive
# from google.colab import drive
# drive.mount('/content/drive')
# csv_path = "/content/drive/MyDrive/path/to/your/student_feedback.csv"
# import pandas as pd
# data = pd.read_csv(csv_path)
# data.head()
```

2) Clean & normalize columns

This will:

- Standardize column names
- Parse dates
- Trim whitespace and unify categories
- Handle missing values

In [7]:
```
import numpy as np

df = data.copy()

# Normalize column names
```

```
df.columns = df.columns.str.strip().str.lower().str.replace('[^a-z0-9]+','_',

# Friendly renames to a common schema
rename_map = {
    'timestamp': 'timestamp',
    'event_name': 'event_name',
    'department': 'department',
    'event_type': 'event_type',
    'rating': 'rating',
    'would_recommend': 'would_recommend',
    'comment': 'comment',
    'duration_hours': 'duration_hours',
    'duration_(hours)': 'duration_hours',
    'attendance': 'attendance',
}
df = df.rename(columns={k:v for k,v in rename_map.items() if k in df.columns})

# Parse timestamp if present
if 'timestamp' in df.columns:
    df['timestamp'] = pd.to_datetime(df['timestamp'], errors='coerce')

# Coerce numeric
for col in ['rating','duration_hours','attendance']:
    if col in df.columns:
        df[col] = pd.to_numeric(df[col], errors='coerce')

# Trim strings
for col in ['event_name','department','event_type','would_recommend','comment'
    if col in df.columns:
        df[col] = df[col].astype('string').str.strip()

# Unify categories
if 'would_recommend' in df.columns:
    df['would_recommend'] = df['would_recommend'].str.lower().map({'yes':'Yes'

if 'event_type' in df.columns:
    df['event_type'] = df['event_type'].str.lower()

# Handle missing ratings/comments
if 'rating' in df.columns:
    df = df[df['rating'].between(1,5)]

df = df.drop_duplicates()

print(df.shape)
df.head()
```

```
(220, 9)
```

Out[7]:

	timestamp	event_name	department	event_type	rating	would_recommend
0	2025-07-04 13:00:00	Alumni Talk Series	Mechanical	expo	4	Yes
1	2025-02-04 15:00:00	Workshop: Python for Data	MBA	workshop	5	Yes
2	2025-03-18 12:00:00	Tech Fest 2025	ECE	expo	4	Yes
3	2025-06-10 16:00:00	Workshop: Python for Data	Biotech	workshop	4	Yes
4	2025-04-12 18:00:00	Cultural Night	CSE	expo	2	Yes

3) Exploratory data analysis (EDA)

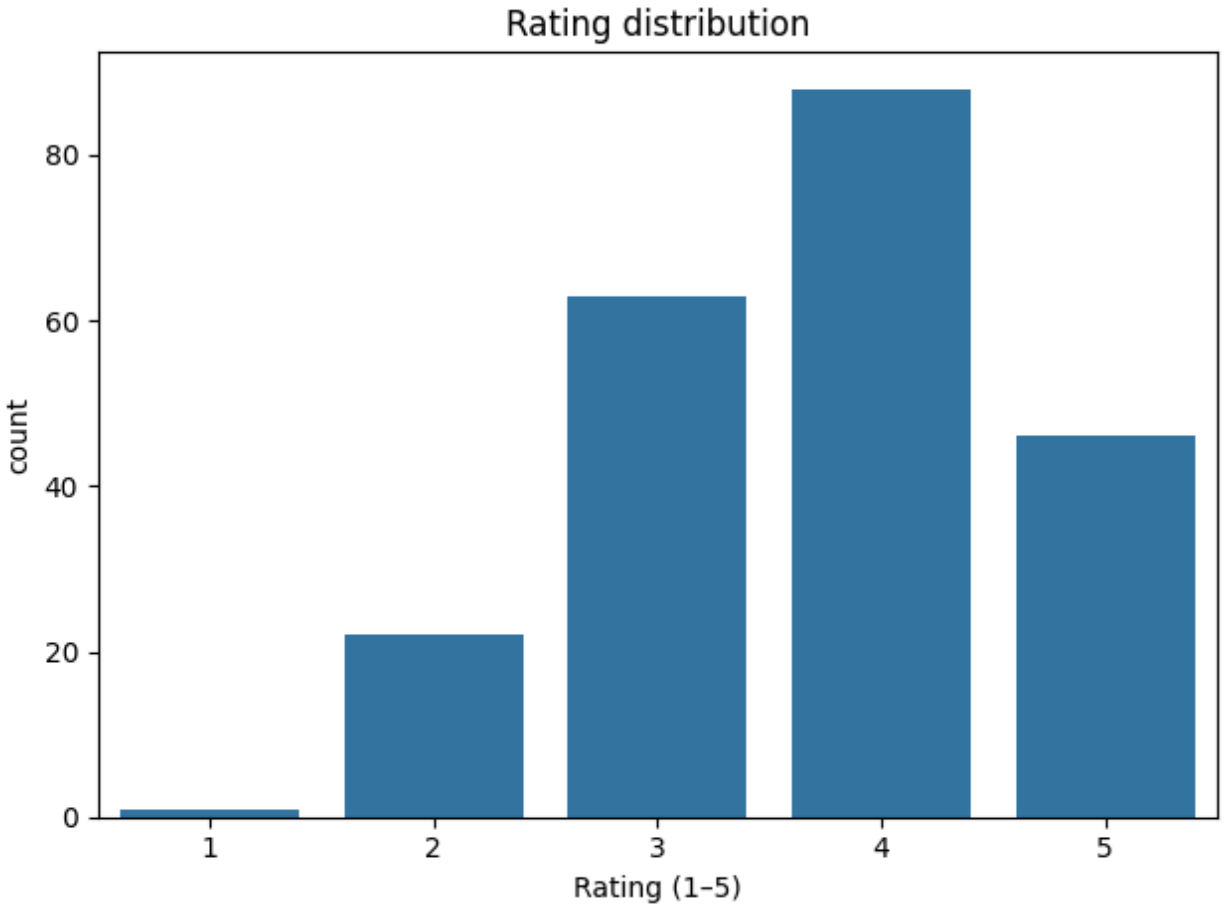
Let's answer:

- Rating distribution
- Average rating by **event**, **event type**, **department**
- Recommendation rate (Yes %)

In [8]:

```
import matplotlib.pyplot as plt
import seaborn as sns

# Rating distribution
plt.figure()
sns.countplot(x='rating', data=df)
plt.title('Rating distribution')
plt.xlabel('Rating (1–5)')
plt.tight_layout()
plt.show()

# Average rating by event
top_events = (df.groupby('event_name')['rating']
                .mean()
                .sort_values(ascending=False)
                .head(10))
print("Top 10 events by average rating:")
```

```
print(top_events)

# Average by event type and department
if 'event_type' in df.columns:
    print("\nAverage rating by event type:")
    print(df.groupby('event_type')['rating'].mean().sort_values(ascending=Fals

if 'department' in df.columns:
    print("\nAverage rating by department:")
    print(df.groupby('department')['rating'].mean().sort_values(ascending=Fals

# Recommend rate
if 'would_recommend' in df.columns:
    rec_rate = (df['would_recommend'] == 'Yes').mean() * 100
    print(f"\nOverall 'Would Recommend' rate: {rec_rate:.1f}%")
```



```
Top 10 events by average rating:
event_name
Hackathon Sprint             3.869565
Cultural Night               3.837838
Tech Fest 2025               3.800000
Career Fair                  3.777778
Alumni Talk Series           3.678571
Workshop: Python for Data    3.611111
Robotics Expo                3.550000
Seminar: AI Ethics           3.500000
Name: rating, dtype: float64

Average rating by event type:
event_type
tech_fest      4.285714
cultural       4.090909
workshop       3.937500
talk           3.750000
competition    3.633333
seminar        3.441176
expo           3.433333
fair           3.370370
Name: rating, dtype: float64

Average rating by department:
department
IT            3.851852
ECE           3.800000
MBA           3.791667
EEE           3.766667
Biotech       3.736842
Civil         3.640000
Mechanical    3.600000
CSE           3.461538
Name: rating, dtype: float64

Overall 'Would Recommend' rate: 66.8%
```

4) Sentiment analysis on comments

In [9]:

```python
import re
from textblob import TextBlob
from vaderSentiment.vaderSentiment import SentimentIntensityAnalyzer

def clean_text(s):
    if pd.isna(s): return s
    s = re.sub(r"http\S+|www\S+"," ", s)  # URLs
    s = re.sub(r"@[\w_]+"," ", s)         # mentions
    s = re.sub(r"#[\w_]+"," ", s)         # hashtags
    s = re.sub(r"[^\w\s']", " ", s)      # punctuation
    s = re.sub(r"\s+"," ", s).strip()
    return s
```

```
if 'comment' in df.columns:
    df['comment_clean'] = df['comment'].apply(clean_text)

    # TextBlob
    df['tb_polarity'] = df['comment_clean'].apply(lambda x: TextBlob(str(x)).s
    df['tb_subjectivity'] = df['comment_clean'].apply(lambda x: TextBlob(str(x

    # VADER
    analyzer = SentimentIntensityAnalyzer()
    df['vader'] = df['comment_clean'].apply(lambda x: analyzer.polarity_scores

    def label_from_vader(v):
        if pd.isna(v): return np.nan
        if v >= 0.05: return 'positive'
        if v <= -0.05: return 'negative'
        return 'neutral'

    df['sentiment'] = df['vader'].apply(label_from_vader)

    print(df[['comment','tb_polarity','vader','sentiment']].head())
else:
    print("No 'comment' column found.")
```

```
                                        comment  tb_polarity   vader  \
0         Great organization and helpful volunteers.     0.800000  0.7845
1             Loved the speaker and the Q&A session.     0.700000  0.5994
2             Loved the speaker and the Q&A session.     0.700000  0.5994
3         Great organization and helpful volunteers.     0.800000  0.7845
4  Session started late; needs better time manage...     0.122222  0.6705

  sentiment
0  positive
1  positive
2  positive
3  positive
4  positive
```

5) Compare sentiment vs. ratings

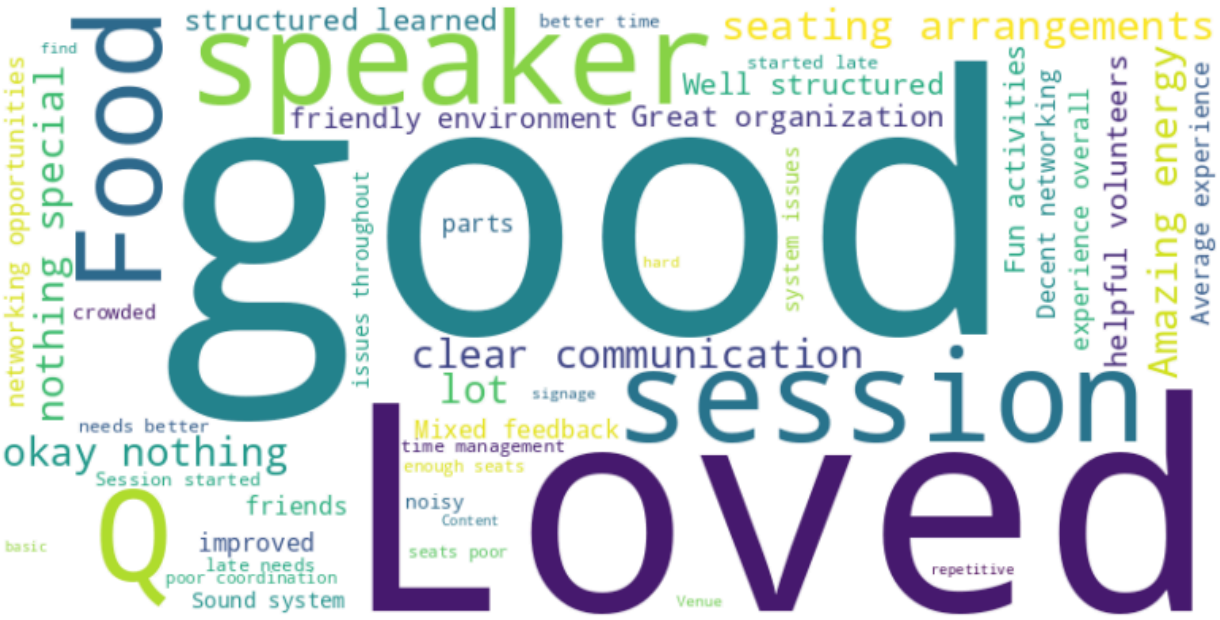
In [10]:
```
if 'rating' in df.columns and 'vader' in df.columns:
    corr = df[['rating','tb_polarity','vader']].corr(numeric_only=True)
    print("Correlation matrix (rating vs sentiment):\n", corr)

    if 'event_type' in df.columns:
        print("\nAverage VADER by event type:")
        print(df.groupby('event_type')['vader'].mean().sort_values(ascending=F

    if 'sentiment' in df.columns:
        print("\nRating by sentiment label:")
        print(df.groupby('sentiment')['rating'].mean().sort_values(ascending=F
```

```
Correlation matrix (rating vs sentiment):
                rating  tb_polarity     vader
rating        1.000000     0.372060  0.467221
tb_polarity   0.372060     1.000000  0.418727
vader         0.467221     0.418727  1.000000

Average VADER by event type:
event_type
tech_fest      0.653695
talk           0.592054
cultural       0.563514
expo           0.525280
workshop       0.513081
seminar        0.485426
fair           0.395033
competition    0.366583
Name: vader, dtype: float64

Rating by sentiment label:
sentiment
positive    3.912088
negative    2.750000
neutral     2.714286
Name: rating, dtype: float64
```

6) Frequent themes (n-grams) & word cloud (optional)

In [12]:

```python
from collections import Counter
from wordcloud import WordCloud, STOPWORDS
import matplotlib.pyplot as plt

if 'comment_clean' in df.columns:
    text = " ".join(df['comment_clean'].dropna().astype(str))
    wordcloud = WordCloud(width=800, height=400, background_color="white",
                          stopwords=STOPWORDS).generate(text)

    plt.figure(figsize=(10,5))
    plt.imshow(wordcloud, interpolation="bilinear")
    plt.axis("off")
    plt.show()
else:
    print("Column 'comment_clean' not found in dataframe.")
```



7) Auto-insights & recommendations

In [13]:

```
lines = []

if 'event_name' in df.columns and 'rating' in df.columns:
    top3 = (df.groupby('event_name')['rating'].mean().sort_values(ascending=Fa
    worst3 = (df.groupby('event_name')['rating'].mean().sort_values().head(3))

    lines.append("Top 3 events by average rating:")
    for k,v in top3.items():
        lines.append(f" - {k}: {v:.2f}")

    lines.append("\nBottom 3 events by average rating:")
    for k,v in worst3.items():
        lines.append(f" - {k}: {v:.2f}")

if 'event_type' in df.columns:
    et = df.groupby('event_type')['rating'].mean().sort_values(ascending=False
    lines.append("\nBest-rated event types: " + ", ".join([f"{k} ({v:.2f})" fo

if 'sentiment' in df.columns:
    sent_counts = df['sentiment'].value_counts(dropna=True, normalize=True) *
    lines.append("\nSentiment split: " + ", ".join([f"{k}: {v:.1f}%" for k,v i

# Simple recommendations from common negatives
recs = []
if 'comment_clean' in df.columns and 'sentiment' in df.columns:
    neg = df.loc[df['sentiment']=='negative','comment_clean'].str.lower().fill
    key_flags = {
        "crowd": "Plan larger venues or cap registrations to avoid overcrowdir
        "noisy": "Improve sound checks and acoustics; designate quiet zones.",
        "late": "Enforce stricter schedules and buffer times for setup.",
```

```
        "sound": "Test audio equipment earlier; keep backup microphones.",
        "seat": "Increase seating capacity or stagger sessions.",
        "basic": "Adjust difficulty level and share pre-event prerequisites.",
        "venue": "Share clearer directions and signage beforehand."
    }
    for k,msg in key_flags.items():
        if neg.str.contains(k).mean() > 0.02:  # appears in >2% of negative co
            recs.append("• " + msg)

if recs:
    lines.append("\nRecommendations:")
    lines.extend(recs)

summary = "\n".join(lines)
print(summary if lines else "Not enough fields to compute insights.")
```

```
Top 3 events by average rating:
 - Hackathon Sprint: 3.87
 - Cultural Night: 3.84
 - Tech Fest 2025: 3.80

Bottom 3 events by average rating:
 - Seminar: AI Ethics: 3.50
 - Robotics Expo: 3.55
 - Workshop: Python for Data: 3.61

Best-rated event types: tech_fest (4.29), cultural (4.09), workshop (3.94)

Sentiment split: positive: 82.7%, negative: 10.9%, neutral: 6.4%

Recommendations:
• Plan larger venues or cap registrations to avoid overcrowding.
• Improve sound checks and acoustics; designate quiet zones.
• Test audio equipment earlier; keep backup microphones.
• Increase seating capacity or stagger sessions.
• Adjust difficulty level and share pre-event prerequisites.
• Share clearer directions and signage beforehand.
```

8) Export cleaned data and features

In [14]:

```
out_csv = "cleaned_feedback_with_sentiment.csv"
df.to_csv(out_csv, index=False)
print(f"Saved: {out_csv}")
```

```
Saved: cleaned_feedback_with_sentiment.csv
```