02_eda_pakistan_news

February 22, 2026

1 02 — EDA Pakistan News Headlines (Kaggle)

Exploratory Data Analysis of the general Pakistani news corpus. **Goal**: understand the dataset structure to use it for Word2Vec training.

[1]:
```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns

df = pd.read_csv('../data/raw/pakistan_news.csv')

print('Shape:', df.shape)
print('Columns:', df.columns.tolist())
```

```
Shape: (26706, 4)
Columns: ['Story Heading', 'Story Excerpt', 'Timestamp', 'Section']
```

[2]:
```
# Overview
print(df.head(10))
print(df.dtypes)
```

```
                                       Story Heading  \
0  Federation of Pakistan v Gen Pervez Musharraf:…
1  Chinese national held for beating traffic poli…
2  Iraqi paramilitaries call for withdrawal from …
3  Sarmad Khoosat reveals why Zindagi Tamasha's t…
4               PSL 2020 set to begin on February 20
5  Despite extreme differences, Centre willing to…
6  'Is NAB law only there for politicians?' asks …
7  UAE Crown Prince to visit Pakistan tomorrow 't…
8  ‘New-year euphoria’ pushes stocks in the green…
9  An Islamabad Police parody account is trolling…

                                       Story Excerpt             Timestamp  \
0  After the special court's verdict in the high …  01 Jan, 2020 09:55pm
1  The suspect assaulted the constable after he p…  01 Jan, 2020 08:35pm
2  Overnight, demonstrators pitched tents and cam…  01 Jan, 2020 07:26pm
3                         We also have a release date.  02 Jan, 2020 01:17pm
4  Of the total 34 matches, 14 will take place in…  02 Jan, 2020 10:56am
```

```
5  Says meeting on Centre's projects in Karachi f…  01 Jan, 2020 03:27pm
6  Opposition criticises government for hastily s…  02 Jan, 2020 08:01am
7  The Emirati crown prince had also visited Paki…  02 Jan, 2020 12:53pm
8  Analysts attribute rise to new year’s "euphori…  01 Jan, 2020 06:13pm
9  Not going to lie, we're more invested than eve…  01 Jan, 2020 03:17pm

    Section
0       NaN
1  Pakistan
2     World
3  Pakistan
4     Sport
5  Pakistan
6       NaN
7     World
8  Business
9  Pakistan
Story Heading    object
Story Excerpt    object
Timestamp        object
Section          object
dtype: object
```

[3]:

```
# Missing values
print('Nulls:\n', df.isnull().sum())
```

```
Nulls:
 Story Heading    230
Story Excerpt      0
Timestamp         11
Section           54
dtype: int64
```

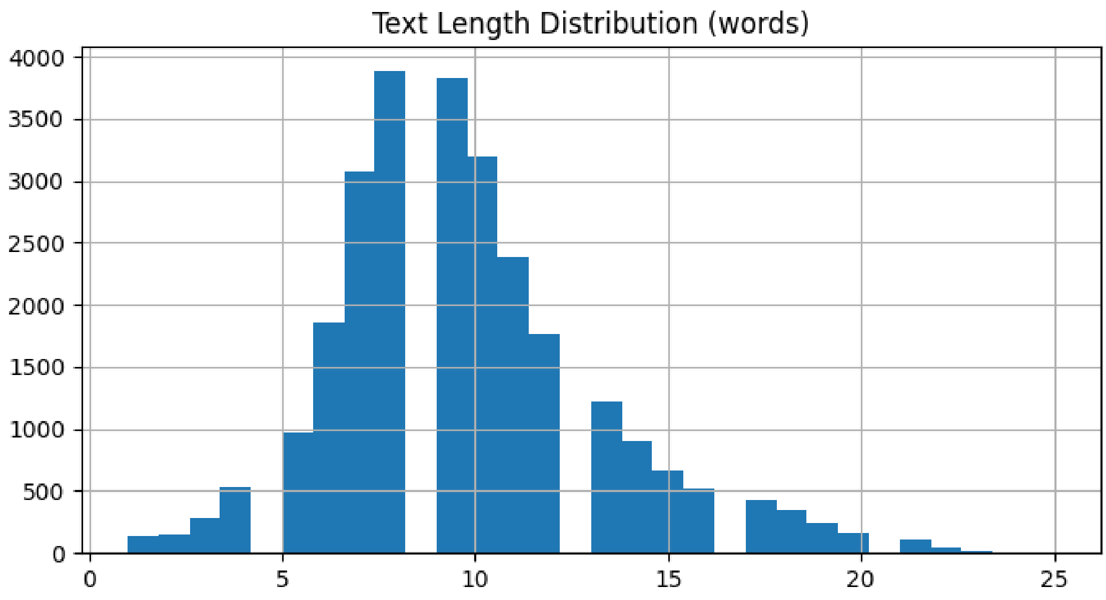
[8]:

```
text_col = 'Story Excerpt'
dupes = df[text_col].duplicated().sum()
print(f'Duplicate rows: {dupes} / {len(df)}')
```

```
Duplicate rows: 336 / 26706
```

[9]:

```
text_col = 'Story Excerpt'
df['text_len'] = df[text_col].astype(str).str.split().str.len()
df['text_len'].hist(bins=30, figsize=(8, 4))
plt.title('Text Length Distribution (words)')
plt.show()
print(df['text_len'].describe())
```



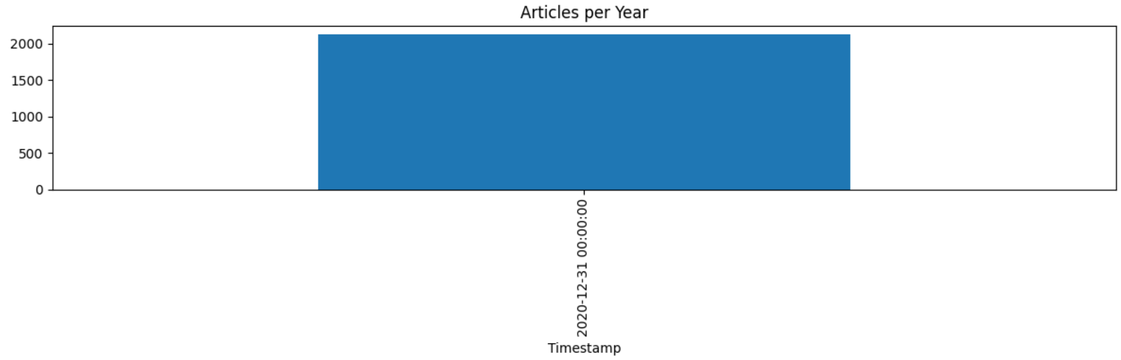
```
count    26706.000000
mean         9.649629
std          3.483981
min          1.000000
25%          7.000000
50%          9.000000
75%         11.000000
max         25.000000
Name: text_len, dtype: float64
```

[11]:

```
if date_candidates:
    date_col = date_candidates[0]

    # Try multiple formats
    for fmt in ['%d %b, %Y %I:%M%p', '%d %b %Y', '%Y-%m-%d', '%d/%m/%Y']:
        parsed = pd.to_datetime(df[date_col], format=fmt, errors='coerce')
        success = parsed.notna().sum()
        print(f'Format {fmt}: {success} parsed')

    # Use the best one or let pandas infer
    df[date_col] = pd.to_datetime(df[date_col], infer_datetime_format=True,␣
 ↪errors='coerce')
    print(f'\nWith infer: {df[date_col].notna().sum()} parsed')
    print(f'Date range: {df[date_col].min()} → {df[date_col].max()}')
    print(f'NaT remaining: {df[date_col].isna().sum()}')
    df.set_index(date_col).resample('YE').size().plot(kind='bar', figsize=(12, 4), title='Articles per Year')
    plt.tight_layout()
    plt.show()
```

```
Format %d %b, %Y %I:%M%p: 2134 parsed
Format %d %b %Y: 2134 parsed
Format %Y-%m-%d: 2134 parsed
Format %d/%m/%Y: 2134 parsed

With infer: 2134 parsed
Date range: 2020-01-01 07:35:00 → 2020-08-14 17:46:00
NaT remaining: 24572
```

```
/tmp/ipykernel_37196/2924954883.py:11: UserWarning: The argument
'infer_datetime_format' is deprecated and will be removed in a future version. A
strict version of it is now the default, see
https://pandas.pydata.org/pdeps/0004-consistent-to-datetime-parsing.html. You
can safely remove this argument.
  df[date_col] = pd.to_datetime(df[date_col], infer_datetime_format=True,
errors='coerce')
```



1.1 EDA Conclusions

- □ Available columns: ...
- □ Total articles: ...
- □ Date range: ...
- □ Duplicates to clean: ...
- □ Average text length: ...
- □ Useful for Word2Vec training: yes/no
- □ Key points to address in preprocessing: ...