CSC-696-001.2025F Final Project(2/2)

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Title: Measuring Ethical Risks in AI-Generated News Using NLP with the UNESCO Ethics of AI Framework

Research Question: How many problematic errors occur ethically in news articles generated by AI to some extent. Also, which category of the AI ethics principles proposed by UNESCO do these issues correspond closest to?

[107] ✓ 0s

```
import torch
import numpy as np
import pandas as pd
import re
from torch.utils.data import Dataset, DataLoader
import torch.nn.functional as F #for softmax
import matplotlib.pyplot as plt

from transformers import AutoTokenizer, AutoModelForSequenceClassification, AutoModel
```

[108] ✓ 0s

```
from google.colab import drive
drive.mount('/content/drive')

import os
```

```
Drive already mounted at /content/drive; to attempt to forcibly remount, call drive.mount("/content/drive", force_remount=True).
```

(why blocked codes) I saved model to local in the previous notebook. But it will take too much time to run and make outputs. I need to save it in drive to use again, so below codes are only for saving.

[109] ✓ 0s

```
# from datasets import Dataset, DatasetDict
# from transformers import (
#     TrainingArguments,
#     Trainer,
# )
# from sklearn.metrics import accuracy_score, f1_score, precision_score, recall_score


# justice_base = "https://huggingface.co/datasets/hendrycks/ethics/resolve/main/data/justice/"

# justice_train_df = pd.read_csv(justice_base + "train.csv")
# justice_val_df   = pd.read_csv(justice_base + "test.csv")
# justice_test_df  = pd.read_csv(justice_base + "test_hard.csv")


# justice_train_df = justice_train_df.rename(columns={"scenario": "text"})
# justice_val_df   = justice_val_df.rename(columns={"scenario": "text"})
# justice_test_df  = justice_test_df.rename(columns={"scenario": "text"})


# for df in [justice_train_df, justice_val_df, justice_test_df]:
#     df["label"] = df["label"].astype(int)
#     df["source"] = "justice"
#     df.drop(
#         columns=[c for c in df.columns if c not in ["text", "label", "source"]],
#         inplace=True
#     )

# print(justice_train_df.head(2))

# model_name = "distilbert-base-uncased"

# tokenizer = AutoTokenizer.from_pretrained(model_name, use_fast=True)

# def compute_metrics(eval_pred):
#     logits, labels = eval_pred
#     preds = np.argmax(logits, axis=-1)
#     acc  = accuracy_score(labels, preds)
#     f1   = f1_score(labels, preds)
#     prec = precision_score(labels, preds)
#     rec  = recall_score(labels, preds)
#     return {
#         "accuracy": acc,
#         "f1": f1,
#         "precision": prec,
#         "recall": rec,
#     }

# def tokenize_batch(batch):
#     return tokenizer(
#         batch["text"],
#         truncation=True,
#         padding="max_length",
#         max_length=128,
#     )

# justice_train_ds = Dataset.from_pandas(justice_train_df, preserve_index=False)
# justice_val_ds   = Dataset.from_pandas(justice_val_df,   preserve_index=False)
# justice_test_ds  = Dataset.from_pandas(justice_test_df,  preserve_index=False)

# data_1_3 = DatasetDict({
#     "train": justice_train_ds,
#     "validation": justice_val_ds,
#     "test": justice_test_ds,
# })

# model_justice = AutoModelForSequenceClassification.from_pretrained(
#     model_name,
#     num_labels=2,
# )

# tokenized_ds_3 = data_1_3.map(tokenize_batch, batched=True)
# print("tokenized_ds_3['train'][0]:", tokenized_ds_3['train'][0])

# tokenized_ds_3 = tokenized_ds_3.remove_columns(["text", "source"])
# tokenized_ds_3.set_format("torch")

# training_args3 = TrainingArguments(
#     output_dir="./ethics-distilbert-justice",
#     num_train_epochs=3,
#     per_device_train_batch_size=16,
#     per_device_eval_batch_size=32,
#     learning_rate=2e-5,
#     weight_decay=0.01,
#     report_to="none",
#     label_smoothing_factor=0.1,
# )

# trainer3 = Trainer(
#     model=model_justice,
#     args=training_args3,
#     train_dataset=tokenized_ds_3["train"],
#     eval_dataset=tokenized_ds_3["validation"],
#     tokenizer=tokenizer,
```

```
#     compute_metrics=compute_metrics,
# )

# trainer3.train()


# save_dir1 = "/content/drive/MyDrive/ethics_models/justice_v1"
# os.makedirs(save_dir1, exist_ok=True)

# trainer3.save_model(save_dir1)
# tokenizer.save_pretrained(save_dir1)

# print("justice_v2 Saved", save_dir1)

# print("Validation metrics:")
# print(trainer3.evaluate(tokenized_ds_3["validation"]))

# print("Test metrics:")
# print(trainer3.evaluate(tokenized_ds_3["test"]))
```

[109] ✓ 0s

```
Start coding or generate with AI.
```

Check the saved models

[110] ✓ 0s

```
save_dir1 = "/content/drive/MyDrive/ethics_models/justice_v1"  # v1

print(os.listdir(save_dir1))
```

```
['config.json', 'model.safetensors', 'tokenizer_config.json', 'special_tokens_map.json', 'vocab.txt', 'tokenizer.json', 'training_args.bin']
```

[111] ✓ 0s

```
tokenizer_v1 = AutoTokenizer.from_pretrained(save_dir1)
model_v1 = AutoModelForSequenceClassification.from_pretrained(save_dir1)

model_v1.eval()

print("justice_v1 id2label:", model_v1.config.id2label)
```

```
justice_v1 id2label: {0: 'LABEL_0', 1: 'LABEL_1'}
```

AI fake news data set

[112] ✓ 0s

```
from datasets import load_dataset
```

[113] ✓ 2s

```
ds = load_dataset("lvulpecula/ai_watermarked_fake_news-v2")

df_news = ds["train"].to_pandas()

print("AI news:", df_news.columns)
df_news.head()
```

```
AI news: Index(['title', 'text', 'model', 'label'], dtype='object')
```

	title	text	model	label
0	Vladimir Putin is friends with Bigfoot	In a shocking revelation that is sure to shake up the world of ...	ChatGPT	False
1	Twitter is shutting down	After years of dominating the social media landscape, Twitter...	ChatGPT	False
2	Scientist have invented a machine for teleportation	In a stunning breakthrough, scientists have announced the suc...	ChatGPT	False
3	Elon Musk has bought the moon	Sources close to Musk's space exploration company, SpaceX, s...	ChatGPT	False
4	Black Death returns to Europe	In a startling development that has sent shockwaves across ...	ChatGPT	False

Next steps: Generate code with df_news | New interactive sheet

[114] ✓ 0s

```
# I will split the articles to sentences and then evaluate
def split_into_sentences(text: str):

    text = str(text).strip()
    if not text:
        return []

    # . ? !
    sentences = re.split(r'(?<=[.!?])+', text)
    sentences = [s.strip() for s in sentences if s.strip()]
    return sentences

# From here using function
rows = []

for idx, row in df_news.iterrows():
    article_id = idx                        # #of articles
    text = row["text"]                      # main text
    title = row.get("title", None)          # title
    src_model = row.get("model", None)      # chatGPT 95.9%

    if isinstance(title, str) and title.strip():
        rows.append({
            "article_id": article_id,
            "sent_idx": -1,                 # titile index is -1 because title is almost important
            "is_title": True,
            "title": title,
            "source_model": src_model,
            "sentence": title.strip(),
        })

    sentences = split_into_sentences(text)
    for sent_idx, sent in enumerate(sentences):
        rows.append({
            "article_id": article_id,
            "sent_idx": sent_idx,
            "is_title": False,
            "title": title,
            "source_model": src_model,
            "sentence": sent,
        })

df_sent = pd.DataFrame(rows)
df_sent["len(sentence)"] = df_sent["sentence"].str.len()
print("How many santences:", len(df_sent))
df_sent.head(15)
```

```
How many santences: 22723
```

	article_id	sent_idx	is_title	title	source_model	sentence	len(sentence)
0	0	-1	True	Vladimir Putin is friends with Bigfoot	ChatGPT	Vladimir Putin is friends with Bigfoot	38
1	0	0	False	Vladimir Putin is friends with Bigfoot	ChatGPT	In a shocking revelation that is sure to shake up the world of ...	261
2	0	1	False	Vladimir Putin is friends with Bigfoot	ChatGPT	According to sources close to the Kremlin, the two unlikel...	200
3	0	2	False	Vladimir Putin is friends with Bigfoot	ChatGPT		1
4	1	-1	True	Twitter is shutting down	ChatGPT	Twitter is shutting down	24
5	1	0	False	Twitter is shutting down	ChatGPT	After years of dominating the social media landscape, Twitter...	168
6	1	1	False	Twitter is shutting down	ChatGPT	The decision comes as a surprise to many, as the micro-...	176
7	1	2	False	Twitter is shutting down	ChatGPT	In a statement released by the company, Twitter cited a lack of...	184
8	1	3	False	Twitter is shutting down	ChatGPT	Despite efforts to pivot the platform towards more profitable v...	249
9	1	4	False	Twitter is shutting down	ChatGPT	\n\nThe announcement has sent shockwaves throughout the tech indus...	225

10	1	5	False	Twitter is shutting down	ChatGPT	Many have taken to the platform to express their sadness and disappoi...	203
11	1	6	False	Twitter is shutting down	ChatGPT	\n\nThe shutdown of Twitter marks the end of an era for social med...	172
12	2	-1	True	Scientist have invented a machine for teleportation	ChatGPT	Scientist have invented a machine for teleportation	51
13	2	0	False	Scientist have invented a machine for teleportation	ChatGPT	In a stunning breakthrough, scientists have announced the suc...	149
14	2	1	False	Scientist have invented a machine for teleportation	ChatGPT	The invention, which has been the subject of science fictio...	164

Next steps: Generate code with df_sent | New interactive sheet

[115] ✓ 0s

```
#df_sent.drop(index=8125, inplace=True) # index 8125's length is more than 2000 and it's broken sentence. so I drop it.
df_sent.sort_values(by="len(sentence)", ascending=False, inplace=True)
df_sent.head(5)
```

	article_id	sent_idx	is_title	title	source_model	sentence	len(sentence)
8125	329	16	False	Famous Actor Found Living Secret Double Life as a Pizza Delivery Driver.	llama 3.1	com/famous-actor-found-living-secret-double-life-pizza-delivery...	2011
9618	375	8	False	Florida Bans HRT for Transgender Individuals Amid Growing Controversy	ChatGPT	The legislation specifically cites concerns over the long-te...	480
9265	367	0	False	Study Claims Watching Excessive Anime Could Cause 'Brain Rot' in Fans	ChatGPT	Tokyo, Japan Ð A controversial new study published in the Journ...	451
5486	236	20	False	Wall Street Stock Exchange Plummets: Global Markets Roiled by Historic Decline	ChatGPT	"\n\nLong-term Outlook\n\nWhile the immediate outlook for Wall St...	418
9610	375	0	False	Florida Bans HRT for Transgender Individuals Amid Growing Controversy	ChatGPT	January 16, 2025 Ð In a highly contentious move, the state of...	416

Next steps: Generate code with df_sent | New interactive sheet

[116] ✓ 0s

```
sentences = df_sent["sentence"].tolist()

print(type(sentences))
print(type(sentences[0]))
```

```
<class 'list'>
<class 'str'>
```

[117] ✓ 0s

```
model_v1.to("cuda")   # GPU
model_v1.eval()
```

```
DistilBertForSequenceClassification(
  (distilbert): DistilBertModel(
    (embeddings): Embeddings(
      (word_embeddings): Embedding(30522, 768, padding_idx=0)
      (position_embeddings): Embedding(512, 768)
      (LayerNorm): LayerNorm((768,), eps=1e-12, elementwise_affine=True)
      (dropout): Dropout(p=0.1, inplace=False)
    )
    (transformer): Transformer(
      (layer): ModuleList(
        (0-5): 6 x TransformerBlock(
          (attention): DistilBertSdpaAttention(
            (dropout): Dropout(p=0.1, inplace=False)
            (q_lin): Linear(in_features=768, out_features=768, bias=True)
            (k_lin): Linear(in_features=768, out_features=768, bias=True)
            (v_lin): Linear(in_features=768, out_features=768, bias=True)
            (out_lin): Linear(in_features=768, out_features=768, bias=True)
          )
          (sa_layer_norm): LayerNorm((768,), eps=1e-12, elementwise_affine=True)
          (ffn): FFN(
            (dropout): Dropout(p=0.1, inplace=False)
            (lin1): Linear(in_features=768, out_features=3072, bias=True)
            (lin2): Linear(in_features=3072, out_features=768, bias=True)
            (activation): GELUActivation()
          )
          (output_layer_norm): LayerNorm((768,), eps=1e-12, elementwise_affine=True)
        )
      )
    )
  )
  (pre_classifier): Linear(in_features=768, out_features=768, bias=True)
  (classifier): Linear(in_features=768, out_features=2, bias=True)
  (dropout): Dropout(p=0.2, inplace=False)
)
```

[118] ✓ 1m

```
# Justice
batch_size = 32
MAX_LEN = 256

all_probs = []
all_preds = []

with torch.no_grad():  # because I'm doing only inference
    for start in range(0, len(sentences), batch_size):
        batch_sents = sentences[start:start + batch_size]

        enc = tokenizer_v1(
            batch_sents,
            truncation=True,
            padding="max_length",
            max_length=MAX_LEN,
            return_tensors="pt",
        )

        enc = {k: v.to("cuda") for k, v in enc.items()}

        outputs = model_v1(**enc)
        logits = outputs.logits

        probs = F.softmax(logits, dim=-1).cpu().numpy()
        preds = np.argmax(probs, axis=-1)

        all_probs.append(probs)
        all_preds.append(preds)

all_probs = np.concatenate(all_probs, axis=0)
all_preds = np.concatenate(all_preds, axis=0)

len(all_probs), len(all_preds), len(df_sent)
```

```
(22723, 22723, 22723)
```

[119] ✓ 0s

```
unethical_id = 1

df_sent["pred_label_id"] = all_preds
df_sent["pred_label_name"] = df_sent["pred_label_id"].map(model_v1.config.id2label)
df_sent["prob_unethical"] = all_probs[:, unethical_id]
df_sent["is_unethical"] = df_sent["pred_label_id"] == unethical_id

df_sent[["article_id", "sent_idx", "is_title", "sentence",
         "pred_label_id", "prob_unethical", "is_unethical"]].head(20)
```

	article_id	sent_idx	is_title	sentence	pred_label_id	prob_unethical	is_unethical
8125	329	16	False	com/famous-actor-found-living-secret-double-life-pizza-delivery...	1	0.911118	True
9618	375	8	False	The legislation specifically cites concerns over the long-te...	1	0.922115	True
9265	367	0	False	Tokyo, Japan Ð A controversial new study published in the Journ...	1	0.863701	True
5486	236	20	False	"\n\nLong-term Outlook\n\nWhile the immediate outlook for Wall St...	1	0.915791	True
9610	375	0	False	January 16, 2025 Ð In a highly contentious move, the state of...	1	0.581937	True
1102	52	21	False	As Germany endures this unparalleled heatwave, the resilience an...	1	0.787497	True
4721	213	21	False	\nAs players gear up to embark on virtual missions and en...	1	0.912190	True
9268	367	3	False	According to the research, individuals who watched more t...	1	0.687070	True

13072	683	12	False	The administrationÕs moratorium on new oil and gas le...	0	0.436809	False
4744	214	20	False	With the support of policymakers, healthcare professionals,...	1	0.668840	True
5018	222	54	False	\n\n\n\n\n\n\n\nIn a deeply personal and unprecedented addres...	1	0.858344	True
7068	286	21	False	"\n\nConclusion\n\nAs speculation and debate continue to swirl,...	0	0.115281	False
9340	369	0	False	January 15, 2025 Ð In an unprecedented revelation from the Int...	1	0.587677	True
21465	1432	14	False	Ó\n\nBreaking News: Governments that seem unaffected by the ch...	1	0.552512	True
20899	1401	5	False	"\n\nDespite being touted as an alternative form of paymen...	0	0.418769	False
6948	281	6	False	"\n\nRationale for the Denunciations\n\nThe denunciations of non...	1	0.904626	True
21093	1411	0	False	Bitcoin, the worldÕs most famous cryptocurrency, has alway...	0	0.201217	False
4896	220	15	False	\n\n\n\n\n\nIn a stunning departure from its storied history and t...	0	0.391741	False
14660	820	3	False	Margaret Steele, a senior researcher involved in the study...	1	0.881924	True
14804	840	3	False	Emily Collins, a clinical psychologist specializing in ad...	0	0.439665	False

[120]
```
article_stats = (
    df_sent
    .groupby("article_id")
    .agg(
        total_sentences = ("sentence", "count"),
        unethical_sentences = ("is_unethical", "sum"),
        avg_prob_unethical = ("prob_unethical", "mean"),
        max_prob_unethical = ("prob_unethical", "max"),
    )
    .reset_index()
)

article_stats["ratio_unethical"] = (
    article_stats["unethical_sentences"] / article_stats["total_sentences"] * 100
)

article_stats.head()
```

	article_id	total_sentences	unethical_sentences	avg_prob_unethical	max_prob_unethical	ratio_unethical
0	0	4	1	0.325404	0.652287	25.000000
1	1	8	7	0.712413	0.863187	87.500000
2	2	11	8	0.649255	0.927047	72.727273
3	3	9	2	0.357526	0.717099	22.222222
4	4	15	12	0.709835	0.951332	80.000000

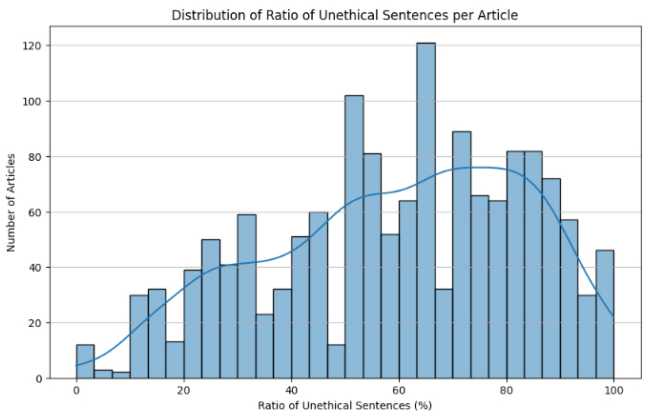
Next steps: Generate code with article_stats | New interactive sheet

[121]
```
THRESH_RATIO = 10.0  # 10%

article_stats["flag_ratio_10"] = (
    article_stats["ratio_unethical"] >= THRESH_RATIO
)
article_stats.head()
```

	article_id	total_sentences	unethical_sentences	avg_prob_unethical	max_prob_unethical	ratio_unethical	flag_ratio_10
0	0	4	1	0.325404	0.652287	25.000000	True
1	1	8	7	0.712413	0.863187	87.500000	True
2	2	11	8	0.649255	0.927047	72.727273	True
3	3	9	2	0.357526	0.717099	22.222222	True
4	4	15	12	0.709835	0.951332	80.000000	True

Next steps: Generate code with article_stats | New interactive sheet

[122]
```
import seaborn as sns

plt.figure(figsize=(10, 6))
sns.histplot(article_stats['ratio_unethical'], bins=30, kde=True)
plt.title('Distribution of Ratio of Unethical Sentences per Article')
plt.xlabel('Ratio of Unethical Sentences (%)')
plt.ylabel('Number of Articles')
plt.grid(axis='y', alpha=0.75)
plt.show()
```



[123]
```
article_stats.sort_values(by="ratio_unethical", ascending=True, inplace=True)
display(article_stats.head())
```

	article_id	total_sentences	unethical_sentences	avg_prob_unethical	max_prob_unethical	ratio_unethical	flag_ratio_10
1246	1246	14	0	0.257731	0.491252	0.0	False
1366	1366	10	0	0.206828	0.466543	0.0	False
1199	1199	8	0	0.343109	0.436087	0.0	False
589	589	7	0	0.283627	0.394374	0.0	False
595	595	10	0	0.309466	0.421485	0.0	False

[124]
```
article_stats.sort_values(by="ratio_unethical", ascending=False, inplace=True)
display(article_stats.head())
```

	article_id	total_sentences	unethical_sentences	avg_prob_unethical	max_prob_unethical	ratio_unethical	flag_ratio_10
23	23	22	22	0.830261	0.957999	100.0	True
929	929	7	7	0.702805	0.838058	100.0	True

1010	1010	6	6	0.704290	0.812520	100.0	True
983	983	13	13	0.890674	0.945678	100.0	True
918	918	7	7	0.788310	0.923399	100.0	True

Selected Articles based on `ratio_unethical` categories

[125] ✓ 0s

```
print('--- Articles representing different ratio_unethical percentages ---')
selected_article_ids = []

for target_ratio in range(0, 101, 10):
    # Find articles within a small range around the target_ratio
    # Use a small epsilon to create a range for matching
    epsilon = 0.5 # e.g., for 10%, look for 9.5% to 10.5%

    # Prioritize articles that haven't been selected yet for diversity
    potential_articles = article_stats[
        (article_stats['ratio_unethical'] >= target_ratio - epsilon) &
        (article_stats['ratio_unethical'] < target_ratio + epsilon) &
        (~article_stats['article_id'].isin(selected_article_ids))
    ]

    if potential_articles.empty:
        # If no new articles found, try without excluding already selected ones
        potential_articles = article_stats[
            (article_stats['ratio_unethical'] >= target_ratio - epsilon) &
            (article_stats['ratio_unethical'] < target_ratio + epsilon)
        ]

    if not potential_articles.empty:
        # Pick the first one found for simplicity
        selected_article = potential_articles.iloc[0]
        selected_article_ids.append(selected_article['article_id'])
        print(f"\nArticle with ratio_unethical around {target_ratio}%:")
        display(selected_article[['article_id', 'ratio_unethical', 'unethical_sentences', 'total_sentences']])
    else:
        print(f"\nNo article found for ratio_unethical around {target_ratio}%")
```

```
--- Articles representing different ratio_unethical percentages ---

Article with ratio_unethical around 0%:
```

	1098
article_id	1098
ratio_unethical	0.0
unethical_sentences	0
total_sentences	8

dtype: object

```
Article with ratio_unethical around 10%:
```

	1239
article_id	1239
ratio_unethical	10.0
unethical_sentences	1
total_sentences	10

dtype: object

```
Article with ratio_unethical around 20%:
```

	998
article_id	998
ratio_unethical	20.0
unethical_sentences	2
total_sentences	10

dtype: object

```
Article with ratio_unethical around 30%:
```

	477
article_id	477
ratio_unethical	30.0
unethical_sentences	3
total_sentences	10

dtype: object

```
Article with ratio_unethical around 40%:
```

	608

[126] ✓ 0s

```
selected_article_ids_simple = []
pd.set_option('display.max_colwidth', None) # Ensure full text is displayed

print('--- Articles with exact ratio_unethical percentages ---')
for target_ratio in range(0, 101, 10):
    exact_match_articles = article_stats[article_stats['ratio_unethical'] == float(target_ratio)]

    if not exact_match_articles.empty:
        # Pick the first one found for simplicity
        selected_article = exact_match_articles.iloc[0]
        selected_article_ids_simple.append(selected_article['article_id'])

        print(f"\nArticle with exact ratio_unethical = {target_ratio}%:")

        output_data = pd.Series({
            'article_id': selected_article['article_id'],
            'ratio_unethical': selected_article['ratio_unethical'],
            'title': df_news.loc[selected_article['article_id'], 'title'],
            'text': df_news.loc[selected_article['article_id'], 'text']
        })
        display(output_data)
        print("-" * 50)
    else:
        print(f"\nNo article found for exact ratio_unethical = {target_ratio}% (might be due to floating point precision).")
        print("-" * 50)

pd.set_option('display.max_colwidth', 50) # Reset to a default or desired width after displaying
```

text	the remarkable commitment made between two beings from different species. The ceremony, conducted with the utmost respect for the gorilla's well-being and legal considerations, aimed to honor the bond and affection shared by the couple.\n\nWhile the marriage has i gnited controversy, [Person's Name] has fervently defended their relationship, emphasizing the deep emotional connection and love they have developed with their gorilla partner. According to [Person's Name], their connection transcends societal expectations and demonstrates the power of empathy and understanding between different species.\n\nCritics argue that such a union raises significant ethical concerns, highlighting the inherent power dynamics and consent issues involved. Experts in the fields of animal behavior and et hics caution that animals, including gorillas, possess limited agency and ability to provide informed consent in human relationships.\n\nThe legal implications of the marriage are equally complex and vary depending on the jurisdiction. Marriage laws typically define mar riage as a union between two human beings, raising questions about the validity and recognition of a union involving a non-human partner.\n\nThe case has reignited discussions surrounding the definition and boundaries of marriage, prompting calls for legal reforms and ethical considerations. Advocacy groups for animal rights and welfare argue for stricter regulations to protect animals from exploitation and ensure their well-being in human relationships.\n\nAmidst the controversy, this unique marriage serves as a catalyst for a broader conversation about the complexities of love, relationships, and societal acceptance. It challenges preconceived notions about what constitutes a meaningful connection and forces us to confront our assumptions about the boundaries of human-animal interactions.\n\nWhil e public opinion remains divided, this unprecedented union raises significant questions about empathy, interspecies communication, and our responsibility towards the animal kingdom. The ongoing discourse surrounding this union will undoubtedly influence future discuss ions on the ethical treatment of animals and the boundaries of human relationships.\n\nAs society grapples with the implications of this extraordinary union, it is crucial to approach the discussion with compassion, respect, and a commitment to understanding diverse per spectives. Ethical considerations, legal frameworks, and the welfare of all parties involved should guide the dialogue as we navigate the uncharted territory of human-animal relationships.

dtype: object

```
--------------------------------------------------

Article with exact ratio_unethical = 90%:
```

	0

article_id	659
ratio_unethical	90.0
title	LGBTQ+ Rights and the Fight for Equal Marriage Worldwide
text	As the global fight for LGBTQ+ rights intensifies, one of the key battlegrounds remains the right to marry. While many countries have made strides in legalizing same-sex marriage, others remain resistant, creating a patchwork of legal recognition that leaves many LGBTQ+ individuals vulnerable to discrimination and inequality.\n\nIn countries like the United States and much of Europe, same-sex marriage is now legal, but in many other parts of the world, LGBTQ+ couples still face steep legal and social hurdles. In some nations, same-sex relationships are criminalized, and LGBTQ+ individuals are denied the fundamental right to marry the person they love.\n\nEven in countries where same-sex marriage is legal, activists are pushing for broader protections. "Marriage equality is an important victory, but itÕs only one piece of the puzzle," said Mark Andrews, an LGBTQ+ rights lawyer. "We need to ensure that LGBTQ+ people are treated equally in all areas of life, including employment, housing, and healthcare."\n\nIn regions like Eastern Europe and parts of Africa, LGBTQ+ activists continue to face uphill battles in their efforts to secure marriage equality. The situation is compounded by social stigma, misinformation, and homophobic violence, which make it difficult for LGBTQ+ individuals to live openly and without fear.

dtype: object

```
Article with exact ratio_unethical = 100%:
```

0

article_id	23
ratio_unethical	100.0
title	Ukrainian Conflict escalated - Ukraine's president Zelensky flees the country
text	In a surprising turn of events that has sent shockwaves throughout Ukraine and the international community, reports have emerged suggesting that President Volodymyr Zelensky has fled the country amidst mounting political and security challenges. While these reports are still unverified and subject to speculation, the implications of such a development are significant and have raised concerns about the stability and future of Ukraine.\n\nAccording to sources close to the situation, Zelensky allegedly made a hasty and secretive departure from Ukraine, leaving behind a power vacuum and a nation grappling with multiple crises. The reasons for his reported flight remain unclear, with various theories circulating regarding the motivations behind his decision.\n\nThe alleged departure of President Zelensky has sparked widespread debate and anxiety, both domestically and internationally. Supporters of the Ukrainian leader express disappointment and concern, highlighting the importance of stable leadership during challenging times. Critics, on the other hand, question his commitment and ability to effectively address the complex issues facing the country.\n\nWithin Ukraine, the reported flight of Zelensky has sparked political turmoil and raised questions about the continuity of government. The vacuum left by his departure has created a power struggle among various political factions, exacerbating an already volatile situation. The country finds itself at a critical crossroads, with urgent decisions needing to be made to ensure stability and the effective functioning of democratic institutions.\n\nThe international community has closely followed these developments, expressing concern for the future of Ukraine and its democratic progress. Calls for calm, dialogue, and the preservation of Ukraine's territorial integrity have been voiced by world leaders and international organizations. Assistance and support have been offered to help navigate the uncertain path ahead.\n\nIt is important to note that while reports of Zelensky's flight from Ukraine continue to circulate, the veracity of these claims remains unconfirmed. It is crucial to approach such reports with caution and await verified information from reliable sources. Speculation and misinformation can further complicate an already complex situation, making it essential to prioritize accurate reporting and responsible analysis.\n\nThe reported departure of President Zelensky underscores the challenges and uncertainties faced by Ukraine and its people. It serves as a reminder of the importance of strong leadership, effective governance, and unity in the face of adversity. The focus now turns to the resilience of Ukrainian institutions and the collective efforts required to navigate this critical juncture in the nation's history.\n\nAs the situation unfolds, both within Ukraine and on the international stage, there is an urgent need for diplomatic engagement, dialogue, and concerted efforts to support Ukraine's democratic processes. The hopes and aspirations of the Ukrainian people for a peaceful, prosperous, and sovereign nation must remain at the forefront of all endeavors as they strive to overcome the current challenges and shape their future.

dtype: object

I could find, justice ca't cover everything. So, add more labe data set

hatexplain

[127] ✓ 0s

```
# pd.set_option('display.max_colwidth', None)
# df_sent[df_sent["article_id"] == 1098]
# pd.set_option('display.max_colwidth', 50) # Reset to a default or desired width after displaying
```

[128] ✓ 0s

```
save_dir_hate = "/content/drive/MyDrive/models/hatexplain_distilbert"

tokenizer_hate = AutoTokenizer.from_pretrained(save_dir_hate)
model_hate = AutoModelForSequenceClassification.from_pretrained(save_dir_hate)
model_hate.eval()

print("hate model id2label:", model_hate.config.id2label)
```

```
hate model id2label: {0: 'hatespeech', 1: 'normal', 2: 'offensive'}
```

[129] ✓ 8m

```
batch_size = 32
MAX_LEN = 128

hate_probs = []
hate_preds = []

with torch.no_grad():
    for start in range(0, len(sentences), batch_size):
        batch_sents = sentences[start:start + batch_size]

        enc = tokenizer_hate(
            batch_sents,
            truncation=True,
            padding="max_length",
            max_length=MAX_LEN,
            return_tensors="pt",
        ).to(model_hate.device)

        outputs = model_hate(**enc)
        logits = outputs.logits

        probs = F.softmax(logits, dim=-1).cpu().numpy()
        preds = np.argmax(probs, axis=-1)

        hate_probs.append(probs)
        hate_preds.append(preds)

hate_probs = np.concatenate(hate_probs, axis=0)
hate_preds = np.concatenate(hate_preds, axis=0)

len(hate_probs), len(hate_preds), len(df_sent)
```

```
(22723, 22723, 22723)
```

[130] ✓ 0s

```
id2label_hate = {i: name.lower() for i, name in model_hate.config.id2label.items()}
print("id2label_hate:", id2label_hate)

hate_id = [i for i, name in id2label_hate.items() if "hate" in name][0]
offensive_id = [i for i, name in id2label_hate.items() if "offensive" in name][0]
normal_id = [i for i, name in id2label_hate.items() if "normal" in name][0]

print("hate_id:", hate_id, "offensive_id:", offensive_id, "normal_id:", normal_id)

df_sent["p_hate"] = hate_probs[:, hate_id]
df_sent["p_offensive"] = hate_probs[:, offensive_id]
df_sent["p_normal"] = hate_probs[:, normal_id]

#hatespeech + offensive
df_sent["prob_hate_offensive"] = df_sent["p_hate"] + df_sent["p_offensive"]

df_sent["is_hate_offensive"] = df_sent["prob_hate_offensive"] > 0.5

df_sent["hate_top_id"] = np.argmax(hate_probs, axis=1)
id2label_for_top = {int(k): v for k, v in id2label_hate.items()}
df_sent["hate_top_label"] = df_sent["hate_top_id"].map(id2label_for_top)

pd.set_option('display.max_colwidth', 80) # Reset to a default or desired width after displaying

df_sent[[
    "article_id", "sent_idx", "is_title", "sentence",
    "p_hate", "p_offensive", "p_normal",
    "prob_hate_offensive", "hate_top_label", "is_hate_offensive"
]].head(15)
```

```
id2label_hate: {0: 'hatespeech', 1: 'normal', 2: 'offensive'}
hate_id: 0 offensive_id: 2 normal_id: 1
```

	article_id	sent_idx	is_title	sentence	p_hate	p_offensive	p_normal	prob_hate_offensive	hate_top_label	is_hate_offensive
8125	329	16	False	com/famous-actor-found-living-secret-double-life-pizza-delivery...	0.024449	0.033690	0.941861	0.058139	normal	False
9618	375	8	False	The legislation specifically cites concerns over the long-te...	0.037834	0.111256	0.850910	0.149090	normal	False
9265	367	0	False	Tokyo, Japan Ð A controversial new study published in the Journ...	0.040626	0.080415	0.878959	0.121041	normal	False
5486	236	20	False	"\n\nLong-term Outlook\n\nWhile the immediate outlook for Wall St...	0.029635	0.061696	0.908670	0.091330	normal	False
9610	375	0	False	January 16, 2025 Ð In a highly contentious move, the state of...	0.032597	0.100989	0.866414	0.133586	normal	False
1102	52	21	False	As Germany endures this unparalleled heatwave, the resilience an...	0.090708	0.117464	0.791828	0.208172	normal	False

4721	213	21	False	\nAs players gear up to embark on virtual missions and en...	0.031822	0.056577	0.911601	0.088399	normal	False
9268	367	3	False	According to the research, individuals who watched more t...	0.032740	0.092377	0.874883	0.125117	normal	False
13072	683	12	False	The administrationÕs moratorium on new oil and gas le...	0.037442	0.084883	0.877675	0.122325	normal	False
4744	214	20	False	With the support of policymakers, healthcare professionals,...	0.068897	0.148724	0.782378	0.217622	normal	False
5018	222	54	False	\n\n\n\n\n\n\n\nIn a deeply personal and unprecedented addres...	0.029191	0.067106	0.903703	0.096297	normal	False
7068	286	21	False	"\n\nConclusion\n\nAs speculation and debate continue to swirl,...	0.023857	0.039105	0.937038	0.062962	normal	False
9340	369	0	False	January 15, 2025 Đ In an unprecedented revelation from the Int...	0.046976	0.048566	0.904458	0.095542	normal	False
21465	1432	14	False	Ó\n\nBreaking News: Governments that seem unaffected by the ch...	0.138561	0.153910	0.707529	0.292471	normal	False
20899	1401	5	False	"\n\nDespite being touted as an alternative form of paymen...	0.032333	0.112940	0.854728	0.145272	normal	False

[131] ✓ 0s

```
df_sent["hate_top_label"].value_counts()
```

hate_top_label	count
normal	22497
offensive	198
hatespeech	28

dtype: int64

[133] ✓ 0s

```
print(article_stats.columns)
article_stats.head()
```

```
Index(['article_id', 'total_sentences', 'unethical_sentences',
       'avg_prob_unethical', 'max_prob_unethical', 'ratio_unethical',
       'flag_ratio_10'],
      dtype='object')
```

	article_id	total_sentences	unethical_sentences	avg_prob_unethical	max_prob_unethical	ratio_unethical	flag_ratio_10
23	23	22	22	0.830261	0.957999	100.0	True
929	929	7	7	0.702805	0.838058	100.0	True
1010	1010	6	6	0.704290	0.812520	100.0	True
983	983	13	13	0.890674	0.945678	100.0	True
918	918	7	7	0.788310	0.923399	100.0	True

Next steps: Generate code with article_stats | New interactive sheet

[134] ✓ 0s

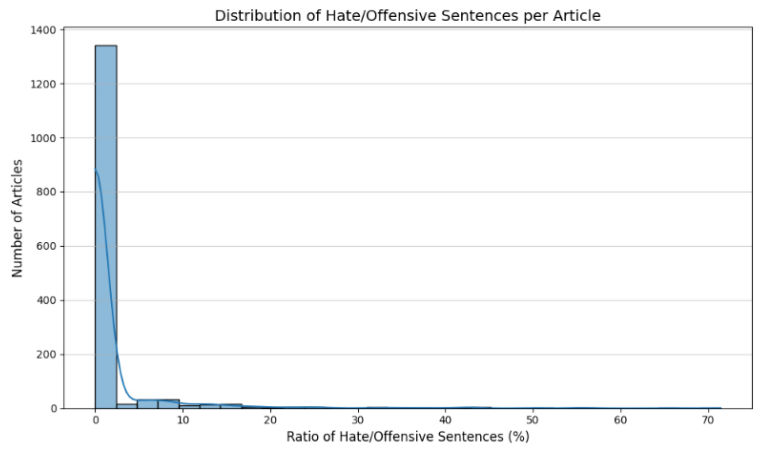
```
hate_stats = df_sent.groupby("article_id").agg(
    avg_hate_off        = ("prob_hate_offensive", "mean"),
    hate_offensive_ratio = ("is_hate_offensive", "mean"),
).reset_index()

article_stats = article_stats.merge(hate_stats, on="article_id", how="left")

article_stats.head()
```

	article_id	total_sentences	unethical_sentences	avg_prob_unethical	max_prob_unethical	ratio_unethical	flag_ratio_10	avg_hate_off	hate_offensive_ratio
0	23	22	22	0.830261	0.957999	100.0	True	0.104539	0.0
1	929	7	7	0.702805	0.838058	100.0	True	0.190515	0.0
2	1010	6	6	0.704290	0.812520	100.0	True	0.121317	0.0
3	983	13	13	0.890674	0.945678	100.0	True	0.165377	0.0
4	918	7	7	0.788310	0.923399	100.0	True	0.127962	0.0

Next steps: Generate code with article_stats | New interactive sheet

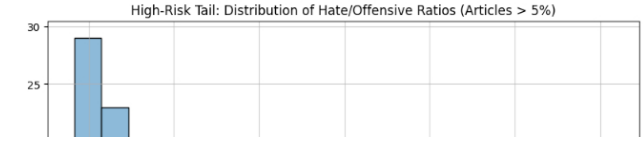
[135] ✓ 0s

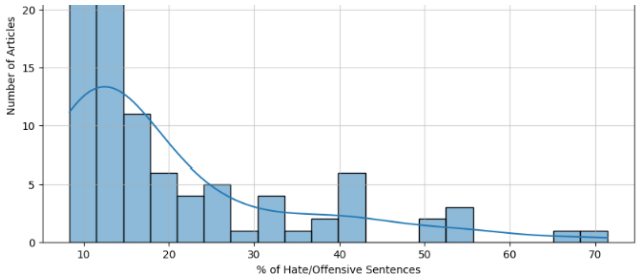
```
plt.figure(figsize=(10, 6))
sns.histplot(article_stats['hate_offensive_ratio'] * 100, bins=30, kde=True)

plt.title('Distribution of Hate/Offensive Sentences per Article', fontsize=14)
plt.xlabel('Ratio of Hate/Offensive Sentences (%)', fontsize=12)
plt.ylabel('Number of Articles', fontsize=12)
plt.grid(axis='y', alpha=0.6)

plt.tight_layout()
plt.show()
```



[136] ✓ 0s

```
tail = article_stats[article_stats["hate_offensive_ratio"] > 0.08]
plt.figure(figsize=(10,6))
sns.histplot(tail["hate_offensive_ratio"]*100, bins=20, kde=True)
plt.title("High-Risk Tail: Distribution of Hate/Offensive Ratios (Articles > 5%)")
plt.xlabel("% of Hate/Offensive Sentences")
plt.ylabel("Number of Articles")
plt.grid(alpha=0.6)
plt.show()
```





[137]
```
pd.set_option('display.max_colwidth', None)
high_risk_articles = article_stats.query("hate_offensive_ratio > 0.10")["article_id"]

sample_sentences = (
    df_sent[df_sent["article_id"].isin(high_risk_articles)]
    .sort_values("prob_hate_offensive", ascending=False)
    .head(20)
)

sample_sentences[[
    "article_id", "sentence",
    "p_hate", "p_offensive", "prob_hate_offensive"
]]
```

	article_id	sentence	p_hate	p_offensive	prob_hate_offensive
968	47	"We will be working diligently to bring this Chicken Nugget Bandit to justice.	0.801103	0.167183	0.968286
972	47	\nAs the investigation unfolds and the Chicken Nugget Bandit remains at large, locals are left contemplating the motivations and cravings that could drive someone to break into a fast-food establishment solely for the purpose of devouring frozen nuggets.	0.666783	0.275200	0.941983
960	47	A sense of disbelief hung in the air as the magnitude of the Chicken Nugget Bandit's escapade began to sink in.	0.313095	0.628625	0.941719
974	47	Whatever the true motivations behind this unusual escapade, one thing is for certain: the Chicken Nugget Bandit has earned a peculiar place in the annals of fast-food lore.	0.303162	0.638229	0.941391
956	47	Once inside, the Chicken Nugget Bandit made a beeline for the restaurant's industrial freezer, where he stumbled upon a treasure trove of frozen chicken nuggets.	0.468793	0.469300	0.938093
20314	1371	Are Drag Queens the Latest Threat to Childhood Innocence?	0.076458	0.854760	0.931218
20381	1376	"We don't need drag queens teaching our children; we need real role models who reflect traditional values.	0.146351	0.770625	0.916976
20272	1366	Are Drag Queens the New 'Messiahs' of Gender Identity?	0.079540	0.833414	0.912953
963	47	The chain's management is working closely with local authorities to investigate the incident and apprehend the rogue nugget enthusiast.	0.494373	0.415819	0.910192
20231	1362	Timothy Marshall, a sociologist and cultural theorist, argues that drag queens are not just entertainersÑthey are pawns in a bigger game.	0.093479	0.805736	0.899214
976	47	\n\nAs authorities continue their search for the elusive nugget enthusiast, one can only hope that this strange chapter will soon be resolved, allowing both McDonald's and the community to move forward, armed with a newfound appreciation for the unique allure of their beloved chicken nuggets.	0.462272	0.436841	0.899113
20227	1362	Could it be that drag queens are part of a larger plan to manipulate society and alter perceptions of gender, identity, and normalcy?	0.124483	0.771593	0.896077
20256	1364	Are Drag Queens Pushing a Dangerous Agenda in Schools?	0.093968	0.791527	0.885494
971	47	Dubbed the "Nugget Feast," it offers customers an opportunity to indulge in unlimited chicken nuggets for a limited period.	0.290861	0.589910	0.880771
954	47	The suspect, aptly dubbed the "Chicken Nugget Bandit" by local media, displayed an unprecedented level of determination and appetite as he executed his peculiar plan.	0.170097	0.707911	0.878008
20224	1362	The Secret Agenda of Drag Queens: Is Your Child Being Brainwashed?	0.128833	0.746602	0.875435
20311	1370	ÒWhat we are witnessing is a calculated effort to destroy traditional gender norms, and drag queens are the faces of this revolution.	0.080416	0.786677	0.867093
17524	1125	Bizarre Nazi Cult Still Operating in Secret Across Europe	0.160772	0.701133	0.861905
20290	1368	Is Drag Queen Culture Destroying the Fabric of Society?	0.128137	0.723655	0.851792
20205	1361	Drag Queens: Dangerous Role Models for Our Children?	0.092631	0.753600	0.846231

[138]
```
df_sent.head(2)
```

						Idea What He Does Biden Says He Is [â€¦]\nâ€ lâ€ m so proud of youâ€ : Woman helps man with autism find job after he was fired for â€ punchingâ€ co-worker at McDonaldâ€ s\nâ€ lâ€ m so proud of youâ€ : Woman helps man with autism find job after he was fired for â€ punchingâ€ co-worker at McDonaldâ€ s A woman has been praised [â€¦]\nBiden Says He Is Proud Of His Son, Hunter, After He Was Forced To Admit To Having No Idea What He Does\nBiden Says He Is Proud Of His Son, Hunter, After He Was Forced To Admit To Having No Idea What He Does Biden Says He Is [â€¦]								
9618	375	8	False	Florida Bans HRT for Transgender Individuals Amid Growing Controversy	ChatGPT	The legislation specifically cites concerns over the long-term health impacts of HRT, including potential risks of infertility, heart disease, and cancer, although many medical organizations have stated that when administered appropriately under the supervision of a healthcare professional, HRT is safe and can significantly improve the quality of life for transgender individuals.	480	1	LABEL_1	0.922115	True	0.037834	0.111256	0.850910	0.149090

Next steps: Generate code with df_sent | New interactive sheet

[139]
```
df_sent[[
    "article_id", "sent_idx", "is_title", "sentence",
    "prob_unethical", "is_unethical",
    "p_hate", "p_offensive", "p_normal",
    "prob_hate_offensive", "is_hate_offensive"
]].head(15)
```

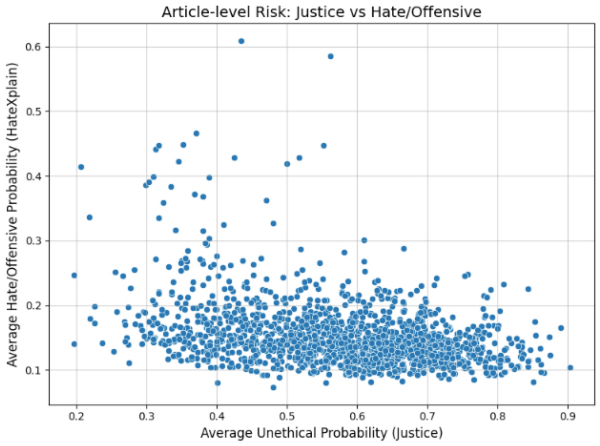
5486	236	20	False	"\n\nLong-term Outlook\n\nWhile the immediate outlook for Wall Street and global financial markets remains uncertain, analysts are cautiously optimistic that the underlying fundamentals of the economy remain strong, with robust corporate earnings, resilient consumer spending, and continued innovation driving long-term growth prospects.	0.915791	True	0.029635	0.061696	0.908670	0.091330	False
9610	375	0	False	January 16, 2025 Ð In a highly contentious move, the state of Florida has officially passed legislation that bans the administration of hormone replacement therapy (HRT) for transgender individuals, a decision that has ignited a national debate on the rights of transgender people and the role of government in regulating medical treatments.	0.581937	True	0.032597	0.100989	0.866414	0.133586	False
1102	52	21	False	As Germany endures this unparalleled heatwave, the resilience and determination of its farmers, scientists, and communities will undoubtedly lead to innovative solutions and renewed commitments to safeguard the well-being of cows and ensure the long-term sustainability of the agricultural sector in the face of a changing climate.	0.787497	True	0.090708	0.117464	0.791828	0.208172	False
4721	213	21	False	\nAs players gear up to embark on virtual missions and engage in epic battles, one thing is clear: Nintendo's entry into warfare simulation software marks a significant milestone in the company's storied history, signaling a new chapter of growth and exploration in the ever-evolving landscape of interactive entertainment.	0.912190	True	0.031822	0.056577	0.911601	0.088399	False
9268	367	3	False	According to the research, individuals who watched more than six hours of anime daily over a sustained period displayed a range of symptoms, including reduced attention spans, difficulty distinguishing reality from fiction, and a concerning obsession with "waifus" or "husbandos" Ð fictional characters idolized by fans.	0.687070	True	0.032740	0.092377	0.874883	0.125117	False
13072	683	12	False	The administrationÕs moratorium on new oil and gas leases on federal land and the cancellation of the Keystone XL pipeline project have angered workers and unions who argue that the transition to green energy is being rushed without sufficient regard for the livelihoods of those employed in traditional energy sectors.	0.436809	False	0.037442	0.084883	0.877675	0.122325	False
4744	214	20	False	With the support of policymakers, healthcare professionals, civil society organizations, and individuals around the world, the global ban on cigarettes represents a historic turning point in the fight against tobacco and a powerful symbol of collective action in pursuit of a healthier, more equitable world for all.	0.668840	True	0.068897	0.148724	0.782378	0.217622	False
5018	222	54	False	\n\n\n\n\n\n\nIn a deeply personal and unprecedented address to the nation, President Joe Biden revealed that he has been diagnosed with Alzheimer's disease, a disclosure that has sent shockwaves through the political landscape and stirred a profound national conversation about leadership, health, and vulnerability.	0.858344	True	0.029191	0.067106	0.903703	0.096297	False
7068	286	21	False	"\n\nConclusion\n\nAs speculation and debate continue to swirl, one thing is certain: the sight of Vladimir Putin riding a dragon without a shirt will go down in history as one of the most extraordinary and surreal moments of the 21st century, leaving an indelible mark on the collective imagination of people around the world.	0.115281	False	0.023857	0.039105	0.937038	0.062962	False
9340	369	0	False	January 15, 2025 Ð In an unprecedented revelation from the International Astronomical Society (IAS), scientists have confirmed that the Sun, the life-giving star at the center of our solar system, will begin the process of dying next month, starting a chain of events that will forever alter the course of life on Earth.	0.587677	True	0.046976	0.048566	0.904458	0.095542	False
21465	1432	14	False	Ó\n\nBreaking News: Governments that seem unaffected by the chaosÑlike Switzerland and New ZealandÑhave been identified as Ösafe zones,Ó with some speculating that these countries may have secretly aligned themselves with the Lizard People in order to maintain a certain level of control in the event of a full-blown invasion.	0.552512	True	0.138561	0.153910	0.707529	0.292471	False
20899	1401	5	False	"\n\nDespite being touted as an alternative form of payment, cryptocurrencies have gained explosive traction over the past few years, and with that growth comes a disturbing theory: central banks are allegedly backing the rise of digital coins, hiding the true motive of their sudden push toward crypto adoption.	0.418769	False	0.032333	0.112940	0.854728	0.145272	False

[141]
```
article_stats.head(1)
```

	article_id	total_sentences	unethical_sentences	avg_prob_unethical	max_prob_unethical	ratio_unethical	flag_ratio_10	avg_hate_off	hate_offensive_ratio
0	23	22	22	0.830261	0.957999	100.0	True	0.104539	0.0

Next steps: Generate code with article_stats | New interactive sheet

[142]
```
plt.figure(figsize=(8, 6))
sns.scatterplot(
    data=article_stats,
    x='avg_prob_unethical',
    y='avg_hate_off'
)

plt.title('Article-level Risk: Justice vs Hate/Offensive', fontsize=14)
plt.xlabel('Average Unethical Probability (Justice)', fontsize=12)
plt.ylabel('Average Hate/Offensive Probability (HateXplain)', fontsize=12)
plt.grid(alpha=0.6)

plt.tight_layout()
plt.show()
```



Mapping to UNESCO data

Justice Only

[143]
```
#Select high (over10%) unethical senteces.
bad_articles = article_stats.loc[article_stats["flag_ratio_10"], "article_id"].tolist()


candidates = df_sent[
    (df_sent["article_id"].isin(bad_articles)) &
    (df_sent["is_unethical"] == True)
].copy()

candidates = candidates.sort_values("prob_unethical", ascending=False)

candidates[["article_id", "sent_idx", "prob_unethical", "sentence"]].head(20)
```

	article_id	sent_idx	prob_unethical	sentence
8090	328	43	0.965895	This procedure is usually performed in cases where the person's head has been severely damaged and cannot be saved.
7345	296	21	0.964735	Their sudden shift to aggressive behavior is alarming and requires urgent investigation.

3899	180	23	0.960509	\nOur thoughts go out to the individuals and families impacted by this incident, and we express our gratitude to the emergency response teams and experts who are working tirelessly to address the situation.
16273	979	1	0.960253	For many families, the initial diagnosis can bring a sense of relief, as it provides clarity about their childÕs behavior and development.
855	43	11	0.960175	Patients rely on medical professionals to provide them with safe, regulated medications as part of their treatment.
7247	294	3	0.960081	Local health officials reported an unusual surge in cases of extreme aggression and erratic behavior among residents.
18602	1242	7	0.959978	Some patients are suffering from severe complications, such as botched surgeries, infections, and life-threatening side effects.
8345	338	27	0.959915	Cryptocurrency exchanges and wallets have been known to be hacked, and investors have lost their money as a result.
8092	328	45	0.959858	One of the most common reasons is head trauma.
6384	263	32	0.959836	"But by staying informed and following safety guidelines, we can minimize the risk and protect ourselves and our loved ones.
8117	329	8	0.959542	When asked how he was able to keep his identity hidden, John said that he had changed his appearance and had been using a false name.
2912	135	3	0.959151	The patient, like any other seeking medical intervention, had high hopes of finding support and understanding from the healthcare professional involved.
1529	72	17	0.959055	Mental health professionals remain cautiously optimistic about his prognosis but stress the importance of long-term support and ongoing monitoring.
4601	209	20	0.958985	"We need to feel safe and ensure the animals are protected as well.
5949	251	5	0.958821	â€ The headstone was smashed, and it looked like someone had used heavy machinery to dig up the grave.
5059	223	12	0.958780	Public health officials are working diligently to trace the source of the infection, which is typically spread through flea bites or contact with infected animals.
6194	257	14	0.958466	â€ \n\nSome speculate that Buddy may have felt threatened or stressed, while others point to potential underlying health issues or previous trauma.
2972	137	17	0.958311	Each case requires careful assessment and individualized treatment plans tailored to the specific needs and circumstances of the patient.
3579	165	23	0.958271	In the meantime, it is advisable to maintain a balanced approach to nutrition, including a variety of foods in appropriate quantities, and to consult healthcare professionals for personalized dietary guidance.
5156	226	7	0.958167	We remain committed to peace and stability, but we must also be prepared to defend ourselves.

UNESCO Ethics data

[144] ✓ 3s

```
unesco_ds = load_dataset("ktiyab/ethical-framework-UNESCO-Ethics-of-AI")
unesco_train = unesco_ds["train"]

unesco_df = unesco_train.to_pandas()

unesco_df.head()
```

3	a886f78c-a696-41c8-a2ec-b3b210b4c2cf	Awareness & Literacy	to inform and educate people about the AI would be irresponsible. It could cause anxiety, errors in handling the AI outputs, and a breakdown of trust. A new technology like this should be introduced with clarity, not secrecy.\n\n**Step 2: Recall the Importance of AI Literacy.** I think about principles that emphasize public understanding and stakeholder education. There's a notion that introducing AI ethically means also empowering people to understand it ([Ethics of Artificial Intelligence	UNESCO](https://www.unesco.org/en/artificial-intelligence/recommendation-ethics#:~:text=Public%20understanding%20of%20AI%20and,training%2C%20media%20%26%20information%20literacy)). Our employees should be given the knowledge and training to work with the AI tool effectively, and customers deserve clear communication when AI affects their accounts. I also remember that well-informed staff can provide better service; if they understand how the AI works (at least at a conceptual level), they can more confidently address customer issues and even give feedback to improve the system. This reflection confirms my belief that we must include an AI literacy component in the rollout.\n\n**Step 3: Develop a Training and Communication Plan.** Next, I sketch out what needs to be done to raise awareness and understanding. For bank staff, I propose interactive training sessions before the AI goes live. In these sessions, we can explain in simple terms how the fraud detection AI works: for instance, it analyzes transaction patterns and flags unusual activity for review. We'll clarify that it's a tool to help them, not an infallible judge or a replacement for their judgment. I'll include examples of what alerts might look like and what steps to take (e.g., reviewing the flagged transaction and contacting the customer if needed). We'll also address their job security concern head-on: emphasize that the AI is there to assist, and human expertise is still crucial to make final decisions on fraud cases. Perhaps I can share case studies of other banks where AI reduced grunt work but employees then focused on more complex tasks, to illustrate that their roles can become more interesting, not eliminated.\n\nFor customers, I plan a communication strategy too. We could add a section on our website or app that explains the new fraud detection measures. For example, a short FAQ: 'Why might the bank block a transaction?' with an explanation that we use advanced AI to protect them, and what to do if a legitimate transaction is flagged by mistake (assuring them that a human will promptly review and resolve such cases). This transparency helps set expectations and shows customers we are proactive about their security.\n\n**Step 4: Advocate to Upper Management.** Armed with this plan, I approach upper management to argue against the 'silent' rollout. I present the potential downsides of minimal training: increased errors, frustrated staff, poor customer experiences. Then I show how a bit of upfront investment in education can pay off. I might quantify it: e.g., 'If confusion leads to 5% more call center queries from customers in the first month, that's actually more costly in staff time than a 2-hour training for employees now.' Also, highlighting reputational risk: a bungled AI rollout could become a news story or at least hurt our customer trust. I emphasize that our goal is not just to deploy cutting-edge tools, but to integrate them smoothly into our human workflows. That requires understanding and buy-in from the people involved.\n\n**Step 5: Implement the Solution.** Suppose I get the go-ahead (which I'm determined to). I then organize the training sessions immediately, perhaps working with the AI developers to simplify the technical details into relatable concepts. I ensure every relevant employee attends and has a chance to ask questions. We might also provide a quick reference guide or set up an internal chat channel for ongoing questions once the system is live. Simultaneously, I coordinate with our communications team to draft the customer-facing explanations. We decide to send out a friendly notification to customers like, 'We've improved our security with AI. Here's what that means for you,' stressing the benefits (like faster fraud detection) and guiding them on what to do if something seems amiss.\n\n**Step 6: Ongoing Literacy and Feedback.** I know that education isn't one-and-done. After launch, I will gather feedback from staff: Are they comfortable using the AI tool? Do they encounter situations they weren't prepared for? I'll hold a follow-up session if needed to address new questions or share experiences among the team. I also monitor customer feedback: if we see confusion or repeated questions, we update our communications accordingly. In essence, I create a loop where we continuously improve understanding as the AI becomes part of our operations.\n\nIn conclusion, I commit to embedding awareness and literacy into this AI deployment. By doing so, we not only avoid the ethical pitfall of keeping people in the dark, but we actively empower our employees and reassure our customers. This approach will help the new fraud detection AI achieve its purpose effectively, supported by a team and user base that understands and trusts it.	for its online banking platform. Most of your bank staff and some customers have little understanding of how AI works; recently, a few employees have expressed fear that the AI might mistakenly flag legitimate transactions or even replace their jobs. The initial plan from upper management was to roll out the system silently, providing only minimal training or explanation to staff, to save time. You believe this approach could lead to confusion, misuse of the AI tools, and mistrust among both employees and customers. How do you ensure proper AI awareness and literacy in this deployment, and handle the ethical concerns around introducing the AI system?
4	55734678-2dea-4d61-bd05-a88f65f27bf3	Awareness & Literacy	I realize that simply deploying the AI isn't enough — the people using it need to understand it well for it to truly help patients. I step back from the technology itself and focus on the human factor: the staff's knowledge, fears, and expectations. Initially, I assumed professionals would gradually adapt to the tool, but the near-miss incident is a wake-up call that a structured approach is needed. I challenge any notion that training is optional or that the AI is 'intuitive enough' without guidance. I decide to roll out a comprehensive AI literacy program in the hospital. This includes hands-on workshops where I explain in accessible terms what the AI does, how it makes predictions, and what its limits are. I encourage staff to ask questions and express concerns, addressing misconceptions (for example, clarifying that the AI is there to assist, not replace human expertise). I also create quick-reference guides and set up a support channel where doctors and nurses can get help understanding AI outputs in real time. To validate that these efforts are working, I plan to monitor how the staff interacts with the AI over the next few months, gather feedback through surveys, and track any incidents or improvements in patient care. By investing in their AI awareness and literacy, I ensure that the technology is integrated ethically and effectively, empowering our staff to use it as a trusted tool rather than a mysterious black box.	You are the CTO of a hospital introducing a new AI system to help staff manage patient flow and predict emergencies. The system is complex, and while it could greatly improve care, most of the doctors and nurses have never worked with such AI tools and some are skeptical or even afraid it will replace their judgment. In a trial run, a few nurses ignored the AI's warnings because they didn't understand how it worked, leading to a critical patient almost being overlooked. This incident shows that without proper AI literacy and trust, the tool could fail or even cause harm. You must implement a plan to ensure the healthcare staff are aware of the AI's capabilities and limitations and know how to use it properly. What do you do to improve AI awareness and literacy among your staff so the system can be used ethically and effectively?

Next steps: Generate code with unesco_df | New interactive sheet

[145] ✓ 0s

```
unesco_df["principle"].value_counts()
```

principle	count
Fairness and Non-Discrimination	133
Right to Privacy and Data Protection	72
Proportionality and Do No Harm	55
Transparency and Explainability	39
Safety and Security	37
Sustainability	35
Human Oversight and Determination	31
Responsibility and Accountability	31
Multi-stakeholder and Adaptive Governance & Collaboration	28
Awareness and Literacy	15
Awareness & Literacy	7
Multi-stakeholder and Adaptive Governance and Collaboration	1
Human Dignity and Autonomy	1
Safety and Security, Responsibility and Accountability, and Human Oversight and Determination	1
Safety and Security & Fairness and Non-Discrimination	1

dtype: int64

[146] ✓ 2s

```
emb_model_name = "distilbert-base-uncased"
#https://huggingface.co/distilbert/distilbert-base-uncased
tok_emb = AutoTokenizer.from_pretrained(emb_model_name)
model_emb = AutoModel.from_pretrained(emb_model_name)
model_emb.to("cuda")
model_emb.eval()
```

```
DistilBertModel(
  (embeddings): Embeddings(
    (word_embeddings): Embedding(30522, 768, padding_idx=0)
    (position_embeddings): Embedding(512, 768)
    (LayerNorm): LayerNorm((768,), eps=1e-12, elementwise_affine=True)
    (dropout): Dropout(p=0.1, inplace=False)
  )
  (transformer): Transformer(
    (layer): ModuleList(
      (0-5): 6 x TransformerBlock(
        (attention): DistilBertSdpaAttention(
          (dropout): Dropout(p=0.1, inplace=False)
          (q_lin): Linear(in_features=768, out_features=768, bias=True)
          (k_lin): Linear(in_features=768, out_features=768, bias=True)
          (v_lin): Linear(in_features=768, out_features=768, bias=True)
          (out_lin): Linear(in_features=768, out_features=768, bias=True)
        )
        (sa_layer_norm): LayerNorm((768,), eps=1e-12, elementwise_affine=True)
        (ffn): FFN(
          (dropout): Dropout(p=0.1, inplace=False)
          (lin1): Linear(in_features=768, out_features=3072, bias=True)
          (lin2): Linear(in_features=3072, out_features=768, bias=True)
          (activation): GELUActivation()
        )
        (output_layer_norm): LayerNorm((768,), eps=1e-12, elementwise_affine=True)
      )
    )
  )
)
```

[147] ✓ 0s

```
def encode_texts(text_list, max_len=128, batch_size=16):

    all_embs = []
    with torch.no_grad():
        for start in range(0, len(text_list), batch_size):
            batch_texts = text_list[start:start + batch_size]
            enc = tok_emb(
                batch_texts,
                padding=True,
                truncation=True,
                max_length=max_len,
                return_tensors="pt",
            )
            enc = {k: v.to("cuda") for k, v in enc.items()}
            outputs = model_emb(**enc)
            last_hidden = outputs.last_hidden_state  # (B, L, H)
            mask = enc["attention_mask"].unsqueeze(-1)  # (B, L, 1)
            summed = (last_hidden * mask).sum(dim=1)
            counts = mask.sum(dim=1)
            emb = summed / counts
            all_embs.append(emb.cpu().numpy())
    return np.vstack(all_embs)
```

[148] ✓ 1s

```
principles = sorted(unesco_df["principle"].unique())
principle_to_vec = {}

for p in principles:
    texts_p = unesco_df.loc[unesco_df["principle"] == p, "response"].tolist()
    embs_p = encode_texts(texts_p, max_len=256, batch_size=16)
    principle_to_vec[p] = embs_p.mean(axis=0)  # (hidden_size,)

len(principle_to_vec), list(principle_to_vec.keys())[:5]
```

```
(15,
 ['Awareness & Literacy',
  'Awareness and Literacy',
  'Fairness and Non-Discrimination',
  'Human Dignity and Autonomy',
  'Human Oversight and Determination'])
```

[149] ✓ 9s

```
from numpy.linalg import norm

def cosine_sim(a, b):
    return float(np.dot(a, b) / (norm(a) * norm(b) + 1e-8))

cand_texts = candidates["sentence"].tolist()
cand_embs = encode_texts(cand_texts, max_len=256, batch_size=32)

all_principles = list(principle_to_vec.keys())
P = len(all_principles)
principle_matrix = np.stack([principle_to_vec[p] for p in all_principles], axis=0)  # (P, H)

pred_principles = []
pred_scores = []

for emb in cand_embs:
    # (P,) cosine similarity
    sims = principle_matrix @ emb / (norm(principle_matrix, axis=1) * norm(emb) + 1e-8)
    idx = int(np.argmax(sims))
    pred_principles.append(all_principles[idx])
    pred_scores.append(float(sims[idx]))

candidates["unesco_principle"] = pred_principles
candidates["unesco_score"]     = pred_scores

candidates[["article_id", "sent_idx", "prob_unethical",
            "sentence", "unesco_principle", "unesco_score"]].head(10)
```

	article_id	sent_idx	prob_unethical	sentence	unesco_principle	unesco_score
8090	328	43	0.965895	This procedure is usually performed in cases where the person's head has been severely damaged and cannot be saved.	Safety and Security	0.790213
7345	296	21	0.964735	Their sudden shift to aggressive behavior is alarming and requires urgent investigation.	Safety and Security	0.754804
3899	180	23	0.960509	\nOur thoughts go out to the individuals and families impacted by this incident, and we express our gratitude to the emergency respon se teams and experts who are working tirelessly to address the situation.	Multi-stakeholder and Adaptive Governance & Collaboration	0.764301
16273	979	1	0.960253	For many families, the initial diagnosis can bring a sense of relief, as it provides clarity about their childÕs behavior and development.	Awareness & Literacy	0.827850
855	43	11	0.960175	Patients rely on medical professionals to provide them with safe, regulated medications as part of their treatment.	Awareness & Literacy	0.784283
7247	294	3	0.960081	Local health officials reported an unusual surge in cases of extreme aggression and erratic behavior among residents.	Safety and Security, Responsibility and Accountability, and Human Oversight and Determination	0.709171
18602	1242	7	0.959978	Some patients are suffering from severe complications, such as botched surgeries, infections, and life-threatening side effects.	Safety and Security	0.740607
8345	338	27	0.959915	Cryptocurrency exchanges and wallets have been known to be hacked, and investors have lost their money as a result.	Awareness and Literacy	0.768208
8092	328	45	0.959858	One of the most common reasons is head trauma.	Fairness and Non-Discrimination	0.670048
6384	263	32	0.959836	"But by staying informed and following safety guidelines, we can minimize the risk and protect ourselves and our loved ones.	Safety and Security, Responsibility and Accountability, and Human Oversight and Determination	0.847313

[150] ✓ 0s

```
count_by_principle = (
    candidates
    .groupby("unesco_principle")
    .size()
    .reset_index(name="count_sentences")
    .sort_values("count_sentences", ascending=False)
)

count_by_principle
```

	unesco_principle	count_sentences
1	Awareness and Literacy	3451

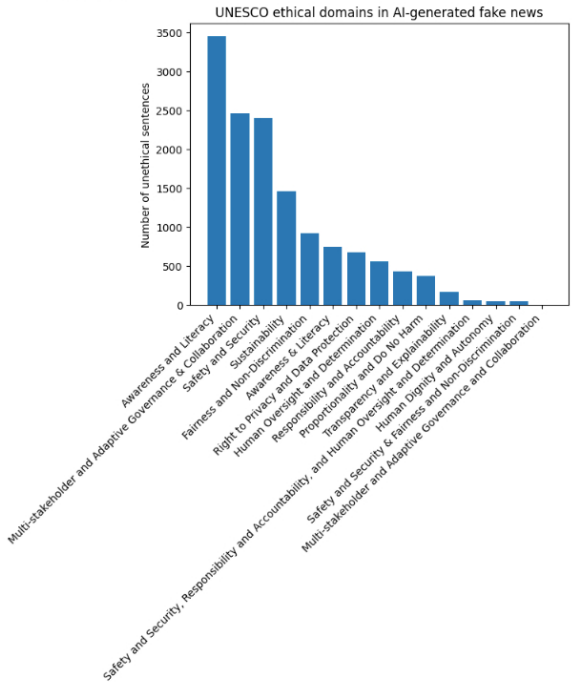
5	Multi-stakeholder and Adaptive Governance & Collaboration	2463
10	Safety and Security	2406
13	Sustainability	1462
2	Fairness and Non-Discrimination	927
0	Awareness & Literacy	746
9	Right to Privacy and Data Protection	679
4	Human Oversight and Determination	564
8	Responsibility and Accountability	432
7	Proportionality and Do No Harm	373
14	Transparency and Explainability	175
12	Safety and Security, Responsibility and Accountability, and Human Oversight and Determination	64
3	Human Dignity and Autonomy	51
11	Safety and Security & Fairness and Non-Discrimination	49
6	Multi-stakeholder and Adaptive Governance and Collaboration	5

Next steps: Generate code with count_by_principle | New interactive sheet

[151] ✓ 0s

```
plt.bar(count_by_principle["unesco_principle"],
        count_by_principle["count_sentences"])
plt.xticks(rotation=45, ha="right")
plt.ylabel("Number of unethical sentences")
plt.title("UNESCO ethical domains in AI-generated fake news")
plt.tight_layout()
plt.show()
```

```
/tmp/ipython-input-2473849228.py:6: UserWarning: Tight layout not applied. The bottom and top margins cannot be made large enough to accommodate all Axes decorations.
  plt.tight_layout()
```



Define Hate/Offensive Ratio Threshold

Subtask:

Define a threshold for the ratio of hate/offensive sentences in articles, similar to the threshold used for unethical sentences. This will be used to flag articles with significant hate/offensive content.

[152] ✓ 0s

```
AVG_PROB_HATE_THRESHOLD = 0.10 # 10% average probability

article_stats["flag_avg_prob_hate"] = (
    article_stats["avg_hate_off"] >= AVG_PROB_HATE_THRESHOLD
)

article_stats.head()
```

	article_id	total_sentences	unethical_sentences	avg_prob_unethical	max_prob_unethical	ratio_unethical	flag_ratio_10	avg_hate_off	hate_offensive_ratio	flag_avg_prob_hate
0	23	22	22	0.830261	0.957999	100.0	True	0.104539	0.0	True
1	929	7	7	0.702805	0.838058	100.0	True	0.190515	0.0	True
2	1010	6	6	0.704290	0.812520	100.0	True	0.121317	0.0	True
3	983	13	13	0.890674	0.945678	100.0	True	0.165377	0.0	True
4	918	7	7	0.788310	0.923399	100.0	True	0.127962	0.0	True

Next steps: Generate code with article_stats | New interactive sheet

[153] ✓ 0s

```
bad_hate_articles = article_stats.loc[article_stats["flag_avg_prob_hate"], "article_id"].tolist()

hate_candidates = df_sent[
    (df_sent["article_id"].isin(bad_hate_articles)) &
    (df_sent["is_hate_offensive"] == True)
].copy()

hate_candidates = hate_candidates.sort_values("prob_hate_offensive", ascending=False)

hate_candidates[["article_id", "sent_idx", "prob_hate_offensive", "sentence"]].head(3)
```

	article_id	sent_idx	prob_hate_offensive	sentence
968	47	16	0.968286	"We will be working diligently to bring this Chicken Nugget Bandit to justice.
972	47	20	0.941983	\nAs the investigation unfolds and the Chicken Nugget Bandit remains at large, locals are left contemplating the motivations and cravings that could drive someone to break into a fast-food establishment solely for the purpose of devouring frozen nuggets.
960	47	8	0.941719	A sense of disbelief hung in the air as the magnitude of the Chicken Nugget Bandit's escapade began to sink in.

[154]
```
hate_cand_texts = hate_candidates["sentence"].tolist()
hate_cand_embs = encode_texts(hate_cand_texts, max_len=256, batch_size=32)

print("Shape of hate_cand_embs:", hate_cand_embs.shape)
```

```
Shape of hate_cand_embs: (317, 768)
```

[155]
```
pred_principles_hate = []
pred_scores_hate = []

for emb in hate_cand_embs:
    sims = principle_matrix @ emb / (norm(principle_matrix, axis=1) * norm(emb) + 1e-8)
    idx = int(np.argmax(sims))
    pred_principles_hate.append(all_principles[idx])
    pred_scores_hate.append(float(sims[idx]))

hate_candidates["unesco_principle"] = pred_principles_hate
hate_candidates["unesco_score"] = pred_scores_hate

hate_candidates[["article_id", "sent_idx", "prob_hate_offensive",
            "sentence", "unesco_principle", "unesco_score"]].head(25)
```

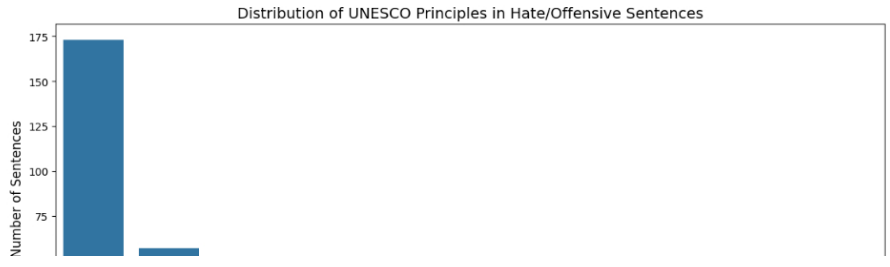
	article_id	sent_idx	prob_hate_offensive	sentence	unesco_principle	unesco_score
968	47	16	0.968286	"We will be working diligently to bring this Chicken Nugget Bandit to justice.	Safety and Security	0.793170
972	47	20	0.941983	\nAs the investigation unfolds and the Chicken Nugget Bandit remains at large, locals are left contemplating the motivations and cravings that could drive someone to break into a fast-food establishment solely for the purpose of devouring frozen nuggets.	Safety and Security	0.819592
960	47	8	0.941719	A sense of disbelief hung in the air as the magnitude of the Chicken Nugget Bandit's escapade began to sink in.	Safety and Security	0.776410
974	47	22	0.941391	Whatever the true motivations behind this unusual escapade, one thing is for certain: the Chicken Nugget Bandit has earned a peculiar place in the annals of fast-food l ore.	Safety and Security	0.793520
956	47	4	0.938093	Once inside, the Chicken Nugget Bandit made a beeline for the restaurant's industrial freezer, where he stumbled upon a treasure trove of frozen chicken nuggets.	Safety and Security	0.767439
20314	1371	-1	0.931218	Are Drag Queens the Latest Threat to Childhood Innocence?	Right to Privacy and Data Protection	0.765898
4198	196	4	0.920551	"It's mind-boggling how these brain-dead idiots keep supporting us.	Awareness and Literacy	0.784206
20381	1376	8	0.916976	"We don't need drag queens teaching our children; we need real role models who reflect traditional values.	Awareness and Literacy	0.820538
20272	1366	-1	0.912953	Are Drag Queens the New 'Messiahs' of Gender Identity?	Awareness and Literacy	0.760763
963	47	11	0.910192	The chain's management is working closely with local authorities to investigate the incident and apprehend the rogue nugget enthusiast.	Safety and Security	0.761515
20231	1362	6	0.899214	Timothy Marshall, a sociologist and cultural theorist, argues that drag queens are not just entertainersÑthey are pawns in a bigger game.	Awareness and Literacy	0.840308
976	47	24	0.899113	\n\nAs authorities continue their search for the elusive nugget enthusiast, one can only hope that this strange chapter will soon be resolved, allowing both McDonald's a nd the community to move forward, armed with a newfound appreciation for the unique allure of their beloved chicken nuggets.	Safety and Security	0.813093
20227	1362	2	0.896077	Could it be that drag queens are part of a larger plan to manipulate society and alter perceptions of gender, identity, and normalcy?	Awareness and Literacy	0.825062
20256	1364	-1	0.885494	Are Drag Queens Pushing a Dangerous Agenda in Schools?	Awareness and Literacy	0.749727
971	47	19	0.880771	Dubbed the "Nugget Feast," it offers customers an opportunity to indulge in unlimited chicken nuggets for a limited period.	Awareness and Literacy	0.738245
954	47	2	0.878008	The suspect, aptly dubbed the "Chicken Nugget Bandit" by local media, displayed an unprecedented level of determination and appetite as he executed his peculiar plan.	Safety and Security	0.759580
20224	1362	-1	0.875435	The Secret Agenda of Drag Queens: Is Your Child Being Brainwashed?	Awareness and Literacy	0.763896
20311	1370	3	0.867093	ÒWhat we are witnessing is a calculated effort to destroy traditional gender norms, and drag queens are the faces of this revolution.	Awareness and Literacy	0.817261
17524	1125	-1	0.861905	Bizarre Nazi Cult Still Operating in Secret Across Europe	Awareness and Literacy	0.680686
20290	1368	-1	0.851792	Is Drag Queen Culture Destroying the Fabric of Society?	Fairness and Non-Discrimination	0.769362
19807	1342	0	0.847364	In a shocking new report, experts are sounding the alarm about the supposed ÒbenefitsÓ of 5G technology.	Safety and Security	0.797347
20205	1361	-1	0.846231	Drag Queens: Dangerous Role Models for Our Children?	Awareness and Literacy	0.758307
952	47	0	0.843211	In a bizarre and audacious act, a man recently broke into a local McDonald's restaurant and embarked on a peculiar eating spree, devouring the entire stock of frozen c hicken nuggets.	Safety and Security	0.744737
20203	1360	15	0.839261	ÒIf children see drag queens as the standard, it could encourage them to adopt behaviors that are out of touch with reality.	Awareness and Literacy	0.857101
18058	1190	5	0.838373	Critics argue that the UNÕs supposed ÒpeacekeepingÓ missions are actually an excuse to insert itself into countriesÕ internal affairs and exert control over their politic al systems.	Human Oversight and Determination	0.812622

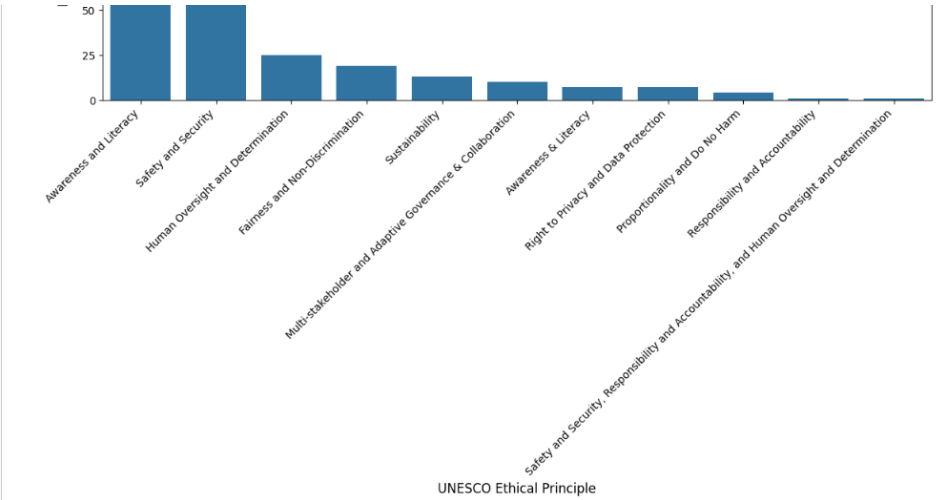
[156]
```
hate_count_by_principle = (
    hate_candidates
    .groupby("unesco_principle")
    .size()
    .reset_index(name="count_sentences")
    .sort_values("count_sentences", ascending=False)
)

hate_count_by_principle
```

	unesco_principle	count_sentences
1	Awareness and Literacy	173
8	Safety and Security	57
3	Human Oversight and Determination	25
2	Fairness and Non-Discrimination	19
10	Sustainability	13
4	Multi-stakeholder and Adaptive Governance & Collaboration	10
0	Awareness & Literacy	7
7	Right to Privacy and Data Protection	7
5	Proportionality and Do No Harm	4
6	Responsibility and Accountability	1
9	Safety and Security, Responsibility and Accountability, and Human Oversight and Determination	1

Next steps: Generate code with hate_count_by_principle | New interactive sheet

[157]
```
plt.figure(figsize=(12, 10))
sns.barplot(x='unesco_principle', y='count_sentences', data=hate_count_by_principle)
plt.xticks(rotation=45, ha='right', fontsize=10)
plt.yticks(fontsize=10)
plt.xlabel('UNESCO Ethical Principle', fontsize=12)
plt.ylabel('Number of Sentences', fontsize=12)
plt.title('Distribution of UNESCO Principles in Hate/Offensive Sentences', fontsize=14)
plt.tight_layout()
plt.show()
```





[158]
✓ 0s

```
conditions = [
    (df_sent['is_unethical'] == True) & (df_sent['is_hate_offensive'] == True),
    (df_sent['is_unethical'] == True) & (df_sent['is_hate_offensive'] == False),
    (df_sent['is_unethical'] == False) & (df_sent['is_hate_offensive'] == True)
]

choices = ['both', 'justice_only', 'hate_only']

df_sent['article_risk_type'] = np.select(conditions, choices, default='none')

df_sent.head()
```

9265	367	0	False	Study Claims Watching Excessive Anime Could Cause 'Brain Rot' in Fans	ChatGPT	he Journal of Media and Cognitive Heal th has sparked a h eated debate among researchers and anime ent husiasts, as it claim s that excessive consumption of anime may lead to a condition descri bed as "brain rot," a colloquial term use d to describe a pe rceived decline in critical thinking and cognitive abilities.	451	1	LABEL_1	0.863701	True	0.040626	0.080415	0.878959	0.121041
5486	236	20	False	Wall Street Stock Exchange Plummets: Global Markets Roiled by Historic Decline	ChatGPT	"\n\nLong-term Outlook\n\nWhile t he immediate outl ook for Wall Street and global financial markets remains un certain, analysts are cautiously opti mistic that the unde rlying fundamentals of the economy rem ain strong, with r obust corporate ea rnings, resilient consumer spendin g, and continued i nnovation driving lo ng-term growth prospects.	418	1	LABEL_1	0.915791	True	0.029635	0.061696	0.908670	0.091330
9610	375	0	False	Florida Bans HRT for Transgender Individuals Amid Growing Controversy	ChatGPT	January 16, 2025 Đ In a highly contentious move, the state of Florida has officially pass ed legislation that bans the administ ration of hormone replacement therap y (HRT) for transg ender individuals, a decision that has ignited a national debate on the rights of transgender people and the role of government in regulating medical t reatments.	416	1	LABEL_1	0.581937	True	0.032597	0.100989	0.866414	0.133586

Next steps: Generate code with df_sent | New interactive sheet

[163]
✓ 0s

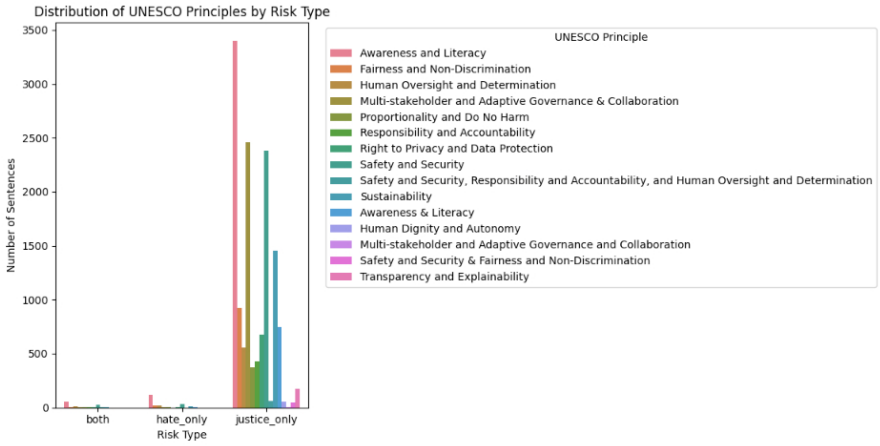
```
# Join
justice_map = candidates[["article_id", "sent_idx", "unesco_principle", "unesco_score"]].copy()
justice_map = justice_map.rename(
    columns={
        "unesco_principle": "unesco_principle_j",
        "unesco_score": "unesco_score_j",
    }
)

hate_map = hate_candidates[["article_id", "sent_idx", "unesco_principle", "unesco_score"]].copy()
hate_map = hate_map.rename(
    columns={
        "unesco_principle": "unesco_principle_h",
        "unesco_score": "unesco_score_h",
    }
)


df_sent["unesco_principle_final"] = df_sent["unesco_principle_j"].combine_first(
    df_sent["unesco_principle_h"]
)
df_sent["unesco_score_final"] = df_sent["unesco_score_j"].combine_first(
    df_sent["unesco_score_h"]
)

df_sent[[
    "article_id", "sent_idx", "article_risk_type",
    "prob_unethical", "prob_hate_offensive",
    "unesco_principle_final", "unesco_score_final"
]].head(10)
```

	article_id	sent_idx	article_risk_type	prob_unethical	prob_hate_offensive	unesco_principle_final	unesco_score_final
0	329	16	justice_only	0.911118	0.058139	Human Oversight and Determination	0.854553

1	375	8	justice_only	0.922115	0.149090	Fairness and Non-Discrimination	0.859046
2	367	0	justice_only	0.863701	0.121041	Awareness and Literacy	0.858250
3	236	20	justice_only	0.915791	0.091330	Sustainability	0.850268
4	375	0	justice_only	0.581937	0.133586	Right to Privacy and Data Protection	0.847549
5	52	21	justice_only	0.787497	0.208172	Sustainability	0.849963
6	213	21	justice_only	0.912190	0.088399	Awareness and Literacy	0.818334
7	367	3	justice_only	0.687070	0.125117	Awareness and Literacy	0.834153
8	683	12	none	0.436809	0.122325	NaN	NaN
9	214	20	justice_only	0.668840	0.217622	Multi-stakeholder and Adaptive Governance & Collaboration	0.847101

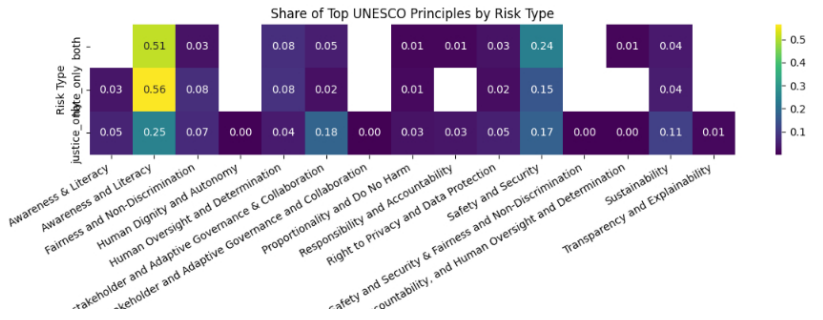
[167] ✓ 0s

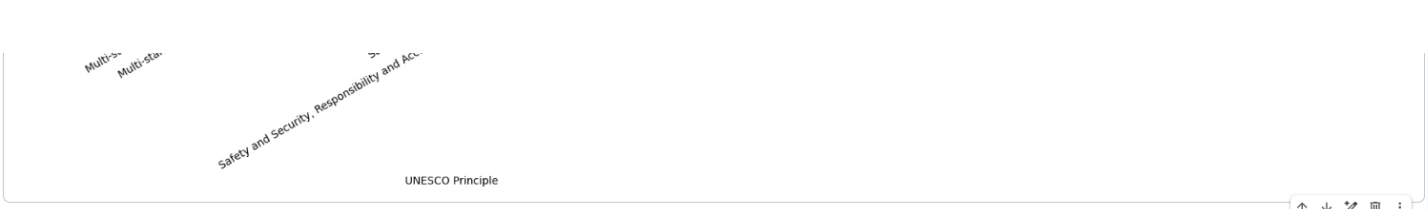
```
pivot = (
    df_sent[df_sent["article_risk_type"] != "none"]
    .groupby(["article_risk_type", "unesco_principle_final"])
    .size()
    .reset_index(name="count")
)

plt.figure(figsize=(12, 6))
sns.barplot(
    data=pivot,
    x="article_risk_type",
    y="count",
    hue="unesco_principle_final"
)

plt.title("Distribution of UNESCO Principles by Risk Type")
plt.xlabel("Risk Type")
plt.ylabel("Number of Sentences")
plt.xticks(rotation=0)
plt.legend(title="UNESCO Principle", bbox_to_anchor=(1.05, 1), loc='upper left')
plt.tight_layout()
plt.show()
```



[174] ✓ 0s

```
tmp = (
    df_sent[df_sent["article_risk_type"] != "none"]
    .groupby(["article_risk_type", "unesco_principle_final"])
    .size()
    .reset_index(name="count")
)

N = 10
top_principles = (
    tmp.groupby("unesco_principle_final")["count"]
      .sum()
      .sort_values(ascending=False)
      .index
)

tmp_top = tmp[tmp["unesco_principle_final"].isin(top_principles)]

tmp_top["prop"] = tmp_top.groupby("article_risk_type")["count"].transform(
    lambda x: x / x.sum()
)

heat = tmp_top.pivot_table(
    index="article_risk_type",
    columns="unesco_principle_final",
    values="prop",
    aggfunc="mean"
)

plt.figure(figsize=(12, 6))
sns.heatmap(
    heat,
    annot=True,
    fmt=".2f",
    cmap="viridis"
)
plt.title("Share of Top UNESCO Principles by Risk Type")
plt.xlabel("UNESCO Principle")
plt.ylabel("Risk Type")
plt.xticks(rotation=30, ha="right")
plt.tight_layout()
plt.show()
```

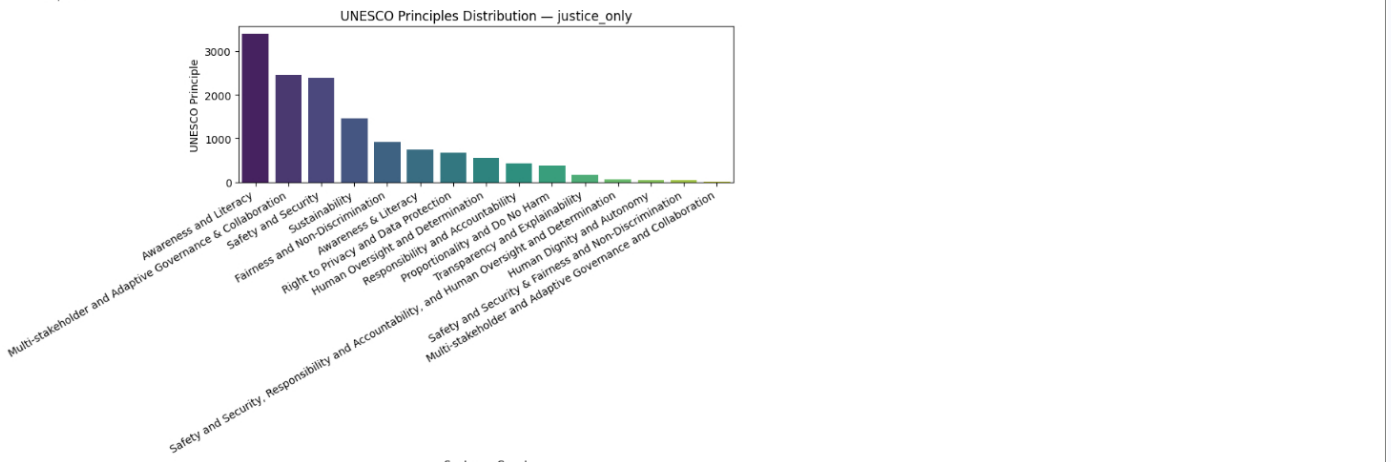




[191] ✓ 0s

```python
def plot_unesco_for_risk(risk_type, data):
    data_risk = data[data["article_risk_type"] == risk_type].copy()
    data_risk = data_risk.sort_values("count", ascending=False)

    plt.figure(figsize=(10, 3))
    sns.barplot(
        data=data_risk,
        x="unesco_principle_final",
        y="count",
        palette="viridis"
    )
    plt.title(f"UNESCO Principles Distribution — {risk_type}")
    plt.xlabel("Sentence Count")
    plt.ylabel("UNESCO Principle")
    plt.tight_layout()
    plt.xticks(rotation=30, ha="right")

    plt.show()

plot_unesco_for_risk("justice_only", tmp_top)
```

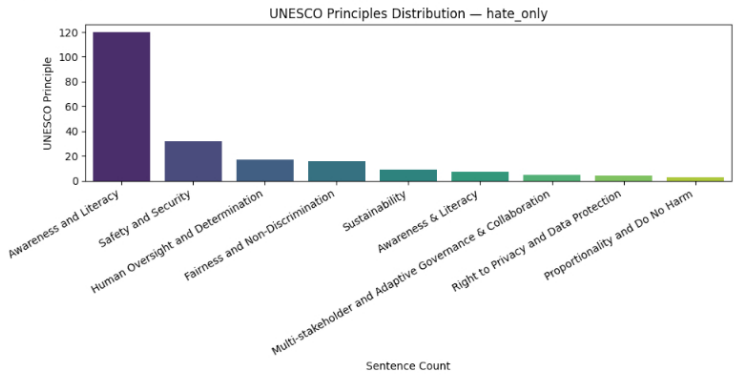
```
/tmp/ipython-input-2121256912.py:6: FutureWarning:

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(
```



[186] ✓ 0s

```python
plot_unesco_for_risk("hate_only", tmp_top)
```

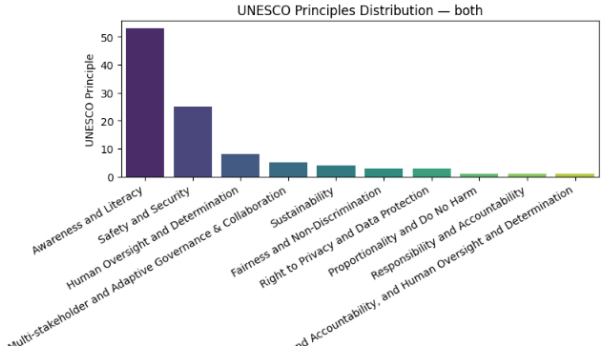
```
/tmp/ipython-input-801607517.py:6: FutureWarning:

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(
```



[187] ✓ 0s

```python
plot_unesco_for_risk("both", tmp_top)
```

```
/tmp/ipython-input-801607517.py:6: 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(
```



Sentence Count