```
!pip install datasets
```

Show hidden output

```
# Loading the dataset
from datasets import load_dataset

ds = load_dataset("knkarthick/dialogsum")
```

```
/usr/local/lib/python3.11/dist-packages/huggingface_hub/utils/_auth.py:94: UserWarning:
The secret `HF_TOKEN` does not exist in your Colab secrets.
To authenticate with the Hugging Face Hub, create a token in your settings tab (https://huggingface.co/settings/tokens), set it as secre
You will be able to reuse this secret in all of your notebooks.
Please note that authentication is recommended but still optional to access public models or datasets.
  warnings.warn(
README.md: 100%                                  4.65k/4.65k [00:00<00:00, 469kB/s]
train.csv: 100%                                  11.3M/11.3M [00:00<00:00, 38.2MB/s]
validation.csv: 100%                             442k/442k [00:00<00:00, 3.48MB/s]
test.csv: 100%                                   1.35M/1.35M [00:00<00:00, 7.00MB/s]
Generating train split: 100%                     12460/12460 [00:00<00:00, 40468.92 examples/s]
Generating validation split: 100%                500/500 [00:00<00:00, 5069.14 examples/s]
Generating test split: 100%                      1500/1500 [00:00<00:00, 19942.55 examples/s]
```

```
ds
```

```
DatasetDict({
    train: Dataset({
        features: ['id', 'dialogue', 'summary', 'topic'],
        num_rows: 12460
    })
    validation: Dataset({
        features: ['id', 'dialogue', 'summary', 'topic'],
        num_rows: 500
    })
    test: Dataset({
        features: ['id', 'dialogue', 'summary', 'topic'],
        num_rows: 1500
    })
})
```

```
ds['train'][1]['dialogue']
```

```
'#Person1#: Hello Mrs. Parker, how have you been?\n#Person2#: Hello Dr. Peters. Just fine thank you. Ricky and I are here for his vacci
nes.\n#Person1#: Very well. Let's see, according to his vaccination record, Ricky has received his Polio, Tetanus and Hepatitis B shot
s. He is 14 months old, so he is due for Hepatitis A, Chickenpox and Measles shots.\n#Person2#: What about Rubella and Mumps?\n#Person1
#: Well, I can only give him these for now, and after a couple of weeks I can administer the rest.\n#Person2#: OK, great. Doctor, I thi
nk I also may need a Tetanus booster. Last time I got it was maybe fifteen years ago!\n#Person1#: We will check our records and I'll ha
```

```
ds['train'][1]['summary']
```

```
'Mrs Parker takes Ricky for his vaccines. Dr. Peters checks the record and then gives Ricky a vaccine.'
```

WITHOUT FINE-TUNING

```
!pip install transformers
```

```
Requirement already satisfied: transformers in /usr/local/lib/python3.11/dist-packages (4.51.3)
Requirement already satisfied: filelock in /usr/local/lib/python3.11/dist-packages (from transformers) (3.18.0)
Requirement already satisfied: huggingface-hub<1.0,>=0.30.0 in /usr/local/lib/python3.11/dist-packages (from transformers) (0.30.2)
Requirement already satisfied: numpy>=1.17 in /usr/local/lib/python3.11/dist-packages (from transformers) (2.0.2)
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.11/dist-packages (from transformers) (24.2)
Requirement already satisfied: pyyaml>=5.1 in /usr/local/lib/python3.11/dist-packages (from transformers) (6.0.2)
Requirement already satisfied: regex!=2019.12.17 in /usr/local/lib/python3.11/dist-packages (from transformers) (2024.11.6)
Requirement already satisfied: requests in /usr/local/lib/python3.11/dist-packages (from transformers) (2.32.3)
Requirement already satisfied: tokenizers<0.22,>=0.21 in /usr/local/lib/python3.11/dist-packages (from transformers) (0.21.1)
Requirement already satisfied: safetensors>=0.4.3 in /usr/local/lib/python3.11/dist-packages (from transformers) (0.5.3)
Requirement already satisfied: tqdm>=4.27 in /usr/local/lib/python3.11/dist-packages (from transformers) (4.67.1)
Requirement already satisfied: fsspec>=2023.5.0 in /usr/local/lib/python3.11/dist-packages (from huggingface-hub<1.0,>=0.30.0->transform
Requirement already satisfied: typing-extensions>=3.7.4.3 in /usr/local/lib/python3.11/dist-packages (from huggingface-hub<1.0,>=0.30.0-
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.11/dist-packages (from requests->transformers) (3.4.1)
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.11/dist-packages (from requests->transformers) (3.10)
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.11/dist-packages (from requests->transformers) (2.4.0)
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.11/dist-packages (from requests->transformers) (2025.4.26)
```

```
from transformers import pipeline

pipe = pipeline("summarization", model="facebook/bart-large-cnn")
```

```
config.json: 100%                                   1.58k/1.58k [00:00<00:00, 140kB/s]
model.safetensors: 100%                                   1.63G/1.63G [00:06<00:00, 277MB/s]
generation_config.json: 100%                                   363/363 [00:00<00:00, 27.6kB/s]
vocab.json: 100%                                   899k/899k [00:00<00:00, 13.3MB/s]
merges.txt: 100%                                   456k/456k [00:00<00:00, 31.1MB/s]
tokenizer.json: 100%                                   1.36M/1.36M [00:00<00:00, 10.8MB/s]
Device set to use cuda:0
```

```
article_1 = ds['train'][1]['dialogue']
```

```
pipe(article_1, max_length = 20, min_length = 10, do_sample = False)
```

```
[{'summary_text': 'Ricky has received his Polio, Tetanus and Hepatitis B shots.'}]
```

WITH FINE-TUNING

```
# Load model directly
from transformers import AutoTokenizer, AutoModelForSeq2SeqLM

tokenizer = AutoTokenizer.from_pretrained("facebook/bart-large-cnn")
model = AutoModelForSeq2SeqLM.from_pretrained("facebook/bart-large-cnn")
```

```
# tokenization
def preprocessor_function(batch):
  source = batch['dialogue']
  target = batch['summary']
  source_ids = tokenizer(source, truncation = True, padding = 'max_length', max_length = 128)
  target_ids = tokenizer(target, truncation = True, padding = 'max_length', max_length = 128)

  labels = target_ids['input_ids']
  labels = [[(label if label != tokenizer.pad_token_id else - 100) for label in labels_example] for labels_example in labels]

  return {
      "input_ids": source_ids["input_ids"],
      "attention_mask": source_ids["attention_mask"],
      "labels": labels
  }
```

```
df_source = ds.map(preprocessor_function, batched = True)
```

```
Map: 100%                                   12460/12460 [00:29<00:00, 539.01 examples/s]
Map: 100%                                   500/500 [00:00<00:00, 813.24 examples/s]
Map: 100%                                   1500/1500 [00:01<00:00, 858.53 examples/s]
```

```
import os
os.environ['WANDB_DISABLED'] = 'True'
```

```
# training_arguments
from transformers import TrainingArguments, Trainer

training_args = TrainingArguments(
    output_dir = "/content",
    per_device_train_batch_size = 8,
    num_train_epochs = 2,
    remove_unused_columns = True
)
```

```
Using the `WANDB_DISABLED` environment variable is deprecated and will be removed in v5. Use the --report_to flag to control the integra
```

```
trainer = Trainer(
    model = model,
    args = training_args,
    train_dataset = df_source['train'],
    eval_dataset = df_source['test']
)
```

```
trainer.train()
```

[3116/3116 50:21, Epoch 2/2]

Step	Training Loss
500	1.591300
1000	1.490500
1500	1.435400
2000	1.085100
2500	1.020500
3000	1.003800

```
/usr/local/lib/python3.11/dist-packages/transformers/modeling_utils.py:3339: UserWarning: Moving the following attributes in the config
  warnings.warn(
TrainOutput(global_step=3116, training_loss=1.2623270962755548, metrics={'train_runtime': 3023.0017, 'train_samples_per_second': 8.243,
'train_steps_per_second': 1.031, 'total_flos': 6750530835578880.0, 'train_loss': 1.2623270962755548, 'epoch': 2.0})
```

```
eval_results = trainer.evaluate()
```

[188/188 00:48]

```
eval_results
```

```
{'eval_loss': 1.6603035926818848,
 'eval_runtime': 48.491,
 'eval_samples_per_second': 30.934,
 'eval_steps_per_second': 3.877,
 'epoch': 2.0}
```

Saving the model

```
model.save_pretrained("/content/model_directory")
tokenizer.save_pretrained("/content/model_directory")
```

```
('/content/model_directory/tokenizer_config.json',
 '/content/model_directory/special_tokens_map.json',
 '/content/model_directory/vocab.json',
 '/content/model_directory/merges.txt',
 '/content/model_directory/added_tokens.json',
 '/content/model_directory/tokenizer.json')
```

```
tokenizer = AutoTokenizer.from_pretrained("/content/model_directory")
model = AutoModelForSeq2SeqLM.from_pretrained("/content/model_directory")
```

```
def summarize(blog_post):
    # Tokenize the input blog post
    inputs = tokenizer(blog_post, max_length=1024, truncation=True, return_tensors='pt')

    # Debug: Print token count
    print(f"Input token count: {len(inputs['input_ids'][0])}")

    # Generate the summary
    summary_ids = model.generate(inputs['input_ids'], max_length=150, min_length=40, length_penalty=2.0, num_beams=4, early_stopping=True)

    # Debug: Print generated token count
    print(f"Generated token count: {len(summary_ids[0])}")

    # decode the summary
    summary = tokenizer.decode(summary_ids[0], skip_special_tokens=True)

    # Debug: Print raw summary with special tokens
    raw_summary = tokenizer.decode(summary_ids[0], skip_special_tokens=False)
    print(f"Raw summary (with special tokens): {raw_summary}")

    return summary


blog_post = """
# The Future of Remote Work: Balancing Flexibility and Collaboration

The COVID-19 pandemic forced an unprecedented shift to remote work, transforming what was once considered a privilege into a necessity overn

## Remote Work: The New Normal

Recent studies suggest that approximately 25% of all professional jobs in North America will be remote by the end of 2022, with that number

The benefits for employees are well-documented: eliminated commutes, improved work-life balance, and the ability to work from anywhere. Comp

## Challenges in the Distributed Workforce

Despite these benefits, fully remote environments present significant challenges. Zoom fatigue—that unique exhaustion that comes from video

Perhaps most concerning is the impact on organizational culture and spontaneous collaboration. The casual conversations by the coffee machin

## Hybrid Models: The Emerging Compromise

In response, many organizations are adopting hybrid work models that combine remote flexibility with in-person collaboration. These approach

1. **Designated in-office days**: Teams coordinate to be present on specific days, maximizing collaborative opportunities.
2. **Activity-based planning**: Work location decisions based on the nature of tasks, with collaborative activities scheduled for office day
3. **Hub-and-spoke models**: Organizations maintain smaller satellite offices closer to where employees live, reducing commutes while preser

Google's approach exemplifies this hybrid evolution. Their "flexible workweek" asks employees to be in the office three days per week, with

## Technology Enabling the Transition

Technology companies are racing to fill the gaps in the remote work experience. Virtual reality meeting spaces, digital whiteboards, and asy

Microsoft's Mesh platform, for example, allows people in different physical locations to join collaborative experiences with the presence of

## The Path Forward: Intentional Design

As we navigate this transformation, the most successful organizations will be those that approach remote and hybrid work with intentionality

The future of work requires balancing the autonomy employees have grown accustomed to with the collaborative culture that drives innovation.

The coming years will likely see continued experimentation as organizations learn what works best for their unique contexts. What's clear is
"""

summary = summarize(blog_post)
print(f'Summary: {summary}')
```

```
><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s>
```

```
dialogue_example = """
User: I need to reschedule my appointment for next week.
Agent: I'd be happy to help you with that. May I have your name and the current appointment date?
User: My name is Alex Smith and my appointment is for Monday at 2pm.
Agent: Thank you, Mr. Smith. I see your appointment here. What day and time would work better for you next week?
User: Would Thursday at 10am be available?
Agent: Let me check... Yes, Thursday at 10am is available. Would you like me to reschedule your appointment for that time?
User: Yes, please. And can you send me a confirmation email?
Agent: Absolutely. I've rescheduled your appointment for Thursday at 10am, and I'll send a confirmation email to the address we have on file.
User: No, that's all. Thank you for your help.
Agent: You're welcome, Mr. Smith. We look forward to seeing you next Thursday at 10am. Have a great day!
"""

summary = summarize(dialogue_example)
print(f'Summary: {summary}')
print(f"Summary: {summary}")
```

```
Input token count: 232
Generated token count: 150
Raw summary (with special tokens): </s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><s><
Summary:
```

Start coding or generate with AI.