

0. Install dependencies

In [20]:

```
# Install PyTorch
```

```
!pip install torch torchvision torchaudio --extra-index-url https://download.pytorch.org/whl/cu117
```

```
Looking in indexes: https://pypi.org/simple, https://download.pytorch.org/whl/cu117
Requirement already satisfied: torch in c:\users\asus\anaconda3\envs\asd123\lib\site-packages (1.13.0+cu117)
Requirement already satisfied: torchvision in c:\users\asus\anaconda3\envs\asd123\lib\site-packages (0.14.0+cu117)
Requirement already satisfied: torchaudio in c:\users\asus\anaconda3\envs\asd123\lib\site-packages (0.13.0+cu117)
Requirement already satisfied: typing-extensions in c:\users\asus\anaconda3\envs\asd123\lib\site-packages (from torch) (4.3.0)
Requirement already satisfied: numpy in c:\users\asus\anaconda3\envs\asd123\lib\site-packages (from torchvision) (1.23.4)
Requirement already satisfied: requests in c:\users\asus\anaconda3\envs\asd123\lib\site-packages (from torchvision) (2.28.1)
Requirement already satisfied: pillow!=8.3.*,>=5.3.0 in c:\users\asus\anaconda3\envs\asd123\lib\site-packages (from torchvision) (9.3.0)
Requirement already satisfied: certifi>=2017.4.17 in c:\users\asus\anaconda3\envs\asd123\lib\site-packages (from requests->torchvision) (2022.9.24)
Requirement already satisfied: idna<4,>=2.5 in c:\users\asus\anaconda3\envs\asd123\lib\site-packages (from requests->torchvision) (3.4)
Requirement already satisfied: charset-normalizer<3,>=2 in c:\users\asus\anaconda3\envs\asd123\lib\site-packages (from requests->torchvision) (2.0.4)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in c:\users\asus\anaconda3\envs\asd123\lib\site-packages (from requests->torchvision) (1.26.12)
```

In [21]:

```
# Install transformers
```

```
!pip install transformers
```

```
Requirement already satisfied: transformers in c:\users\asus\anaconda3\envs\asd123\lib\site-packages (4.24.0)
Requirement already satisfied: huggingface-hub<1.0,>=0.10.0 in c:\users\asus\anaconda3\envs\asd123\lib\site-packages (from transformers) (0.11.0)
Requirement already satisfied: numpy>=1.17 in c:\users\asus\anaconda3\envs\asd123\lib\site-packages (from transformers) (1.23.4)
Requirement already satisfied: tqdm>=4.27 in c:\users\asus\anaconda3\envs\asd123\lib\site-packages (from transformers) (4.64.1)
Requirement already satisfied: requests in c:\users\asus\anaconda3\envs\asd123\lib\site-packages (from transformers) (2.28.1)
Requirement already satisfied: pyyaml>=5.1 in c:\users\asus\anaconda3\envs\asd123\lib\site-packages (from transformers) (6.0)
Requirement already satisfied: tokenizers!=0.11.3,<0.14,>=0.11.1 in c:\users\asus\anaconda3\envs\asd123\lib\site-packages (from transformers) (0.13.2)
Requirement already satisfied: filelock in c:\users\asus\anaconda3\envs\asd123\lib\site-packages (from transformers) (3.8.0)
Requirement already satisfied: packaging>=20.0 in c:\users\asus\anaconda3\envs\asd123\lib\site-packages (from transformers) (21.3)
Requirement already satisfied: regex!=2019.12.17 in c:\users\asus\anaconda3\envs\asd123\lib\site-packages (from transformers) (2022.10.31)
Requirement already satisfied: typing-extensions>=3.7.4.3 in c:\users\asus\anaconda3\envs\asd123\lib\site-packages (from huggingface-hub<1.0,>=0.10.0->transformers) (4.3.0)
Requirement already satisfied: pyparsing!=3.0.5,>=2.0.2 in c:\users\asus\anaconda3\envs\asd123\lib\site-packages (from packaging>=20.0->transformers) (3.0.9)
Requirement already satisfied: colorama in c:\users\asus\anaconda3\envs\asd123\lib\site-packages (from tqdm>=4.27->transformers) (0.4.5)
Requirement already satisfied: idna<4,>=2.5 in c:\users\asus\anaconda3\envs\asd123\lib\site-packages (from requests->transformers) (3.4)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in c:\users\asus\anaconda3\envs\asd123\lib\site-packages (from requests->transformers) (1.26.12)
```

Requirement already satisfied: certifi<=2017.4.17 in c:\users\asus\anaconda3\envs\asdl23\lib\site-packages (from requests->transformers) (2022.9.24)
Requirement already satisfied: charset-normalizer<3,>=2 in c:\users\asus\anaconda3\envs\asdl23\lib\site-packages (from requests->transformers) (2.0.4)

1. Import and Load Model

In [22]:

```
# Importing dependencies from transformers
from transformers import PegasusForConditionalGeneration, PegasusTokenizer
```

In [23]:

```
# Load tokenizer
tokenizer = PegasusTokenizer.from_pretrained("google/pegasus-xsum")
```

In [24]:

```
# Load model
model = PegasusForConditionalGeneration.from_pretrained("google/pegasus-xsum")
```

2. Perform Abstractive Summarization

In [25]:

```
text = """
Google LLC (/ˈɡuːɡəl/ (listen)) is an American multinational technology company focusing on search engine technology, online advertising, cloud computing, computer software, quantum computing, e-commerce, artificial intelligence,[9] and consumer electronics. It has been referred to as "the most powerful company in the world"[10] and one of the world's most valuable brands due to its market dominance, data collection, and technological advantages in the area of artificial intelligence.[11][12][13] Its parent company Alphabet is considered one of the Big Five American information technology companies, alongside Amazon, Apple, Meta, and Microsoft.
```

Google was founded on September 4, 1998, by Larry Page and Sergey Brin while they were Ph D students at Stanford University in California. Together they own about 14% of its publicly listed shares and control 56% of the stockholder voting power through super-voting stock. The company went public via an initial public offering (IPO) in 2004. In 2015, Google was reorganized as a wholly owned subsidiary of Alphabet Inc. Google is Alphabet's largest subsidiary and is a holding company for Alphabet's Internet properties and interests. Sundar Pichai was appointed CEO of Google on October 24, 2015, replacing Larry Page, who became the CEO of Alphabet. On December 3, 2019, Pichai also became the CEO of Alphabet.[14]

The company has since rapidly grown to offer a multitude of products and services beyond Google Search, many of which hold dominant market positions. These products address a wide range of use cases, including email (Gmail), navigation (Waze & Maps), cloud computing (Cloud), web browsing (Chrome), video sharing (YouTube), productivity (Workspace), operating systems (Android), cloud storage (Drive), language translation (Translate), photo storage (Photos), video calling (Meet), smart home (Nest), smartphones (Pixel), wearable technology (Pixel Watch & Fitbit), music streaming (YouTube Music), video on demand (YouTube TV), artificial intelligence (Google Assistant), machine learning APIs (TensorFlow), AI chips (TPU), and more. Discontinued Google products include gaming (Stadia), Glass,[citation needed] Google+, Reader, Play Music, Nexus, Hangouts, and Inbox by Gmail.[15][16]

Google's other ventures outside of Internet services and consumer electronics include quantum computing (Sycamore), self-driving cars (Waymo, formerly the Google Self-Driving Car Project), smart cities (Sidewalk Labs), and transformer models (Google Brain).[17]

Google and YouTube are the two most visited websites worldwide followed by Facebook and Twitter. Google is also the largest search engine, mapping and navigation application, email provider, office suite, video sharing platform, photo and cloud storage provider, mobile operating system, web browser, ML framework, and AI virtual assistant provider in the world as measured by market share. On the list of most valuable brands, Google is ranked second by Forbes[18] and fourth by Interbrand.[19] It has received significant criticism involving issues such as privacy concerns, tax avoidance, censorship, search neutrality,

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