```
!pip install transformers torch sentence-transformers pyttsx3 openai
!apt-get install -y tesseract-ocr
!pip install pytesseract
```

```
      Successfully uninstalled nvidia-cuda-nvrtc-cu12-12.5.82
  Attempting uninstall: nvidia-cuda-cupti-cu12
    Found existing installation: nvidia-cuda-cupti-cu12 12.5.82
    Uninstalling nvidia-cuda-cupti-cu12-12.5.82:
      Successfully uninstalled nvidia-cuda-cupti-cu12-12.5.82
  Attempting uninstall: nvidia-cublas-cu12
    Found existing installation: nvidia-cublas-cu12 12.5.3.2
    Uninstalling nvidia-cublas-cu12-12.5.3.2:
      Successfully uninstalled nvidia-cublas-cu12-12.5.3.2
  Attempting uninstall: nvidia-cusparse-cu12
    Found existing installation: nvidia-cusparse-cu12 12.5.1.3
    Uninstalling nvidia-cusparse-cu12-12.5.1.3:
      Successfully uninstalled nvidia-cusparse-cu12-12.5.1.3
  Attempting uninstall: nvidia-cudnn-cu12
    Found existing installation: nvidia-cudnn-cu12 9.3.0.75
    Uninstalling nvidia-cudnn-cu12-9.3.0.75:
      Successfully uninstalled nvidia-cudnn-cu12-9.3.0.75
  Attempting uninstall: nvidia-cusolver-cu12
    Found existing installation: nvidia-cusolver-cu12 11.6.3.83
    Uninstalling nvidia-cusolver-cu12-11.6.3.83:
      Successfully uninstalled nvidia-cusolver-cu12-11.6.3.83
Successfully installed nvidia-cublas-cu12-12.4.5.8 nvidia-cuda-cupti-cu12-12.4.127 nvidia-cuda-nvrtc-cu12-12.4.127 nvidia-cuda-runtim
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  tesseract-ocr-eng tesseract-ocr-osd
The following NEW packages will be installed:
  tesseract-ocr tesseract-ocr-eng tesseract-ocr-osd
0 upgraded, 3 newly installed, 0 to remove and 29 not upgraded.
Need to get 4,816 kB of archives.
After this operation, 15.6 MB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu jammy/universe amd64 tesseract-ocr-eng all 1:4.00~git30-7274cfa-1.1 [1,591 kB]
Get:2 http://archive.ubuntu.com/ubuntu jammy/universe amd64 tesseract-ocr-osd all 1:4.00~git30-7274cfa-1.1 [2,990 kB]
Get:3 http://archive.ubuntu.com/ubuntu jammy/universe amd64 tesseract-ocr amd64 4.1.1-2.1build1 [236 kB]
Fetched 4,816 kB in 1s (4,308 kB/s)
Selecting previously unselected package tesseract-ocr-eng.
(Reading database ... 124947 files and directories currently installed.)
Preparing to unpack .../tesseract-ocr-eng_1%3a4.00~git30-7274cfa-1.1_all.deb ...
Unpacking tesseract-ocr-eng (1:4.00~git30-7274cfa-1.1) ...
Selecting previously unselected package tesseract-ocr-osd.
Preparing to unpack .../tesseract-ocr-osd_1%3a4.00~git30-7274cfa-1.1_all.deb ...
Unpacking tesseract-ocr-osd (1:4.00~git30-7274cfa-1.1) ...
Selecting previously unselected package tesseract-ocr.
Preparing to unpack .../tesseract-ocr_4.1.1-2.1build1_amd64.deb ...
Unpacking tesseract-ocr (4.1.1-2.1build1) ...
Setting up tesseract-ocr-eng (1:4.00~git30-7274cfa-1.1) ...
Setting up tesseract-ocr-osd (1:4.00~git30-7274cfa-1.1) ...
Setting up tesseract-ocr (4.1.1-2.1build1) ...
Processing triggers for man-db (2.10.2-1) ...
Collecting pytesseract
  Downloading pytesseract-0.3.13-py3-none-any.whl.metadata (11 kB)
Requirement already satisfied: packaging>=21.3 in /usr/local/lib/python3.11/dist-packages (from pytesseract) (24.2)
Requirement already satisfied: Pillow>=8.0.0 in /usr/local/lib/python3.11/dist-packages (from pytesseract) (11.1.0)
Downloading pytesseract-0.3.13-py3-none-any.whl (14 kB)
Installing collected packages: pytesseract
Successfully installed pytesseract-0.3.13
```

```
!pip install gtts
```

```
Collecting gtts
  Downloading gTTS-2.5.4-py3-none-any.whl.metadata (4.1 kB)
Requirement already satisfied: requests<3,>=2.27 in /usr/local/lib/python3.11/dist-packages (from gtts) (2.32.3)
Requirement already satisfied: click<8.2,>=7.1 in /usr/local/lib/python3.11/dist-packages (from gtts) (8.1.8)
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.11/dist-packages (from requests<3,>=2.27->gtts) (3.4.1
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.11/dist-packages (from requests<3,>=2.27->gtts) (3.10)
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.11/dist-packages (from requests<3,>=2.27->gtts) (2.3.0)
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.11/dist-packages (from requests<3,>=2.27->gtts) (2025.1.31)
Downloading gTTS-2.5.4-py3-none-any.whl (29 kB)
Installing collected packages: gtts
Successfully installed gtts-2.5.4
```

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

```
Mounted at /content/drive
```

```
import os

extracted_texts_path = "/content/drive/My Drive/extracted_texts_indexed_cleaned.txt"
summarized_texts_path = "/content/drive/My Drive/summarized_texts_indexed_cleaned.txt"

extracted_texts = {}
with open(extracted_texts_path, "r", encoding="utf-8") as f:
    lines = f.readlines()
    for i in range(0, len(lines), 3):
        index, filename = lines[i].strip().split('. ', 1)
        text = lines[i+1].strip() if i + 1 < len(lines) else ""
        extracted_texts[filename.lower()] = text

summarized_texts = {}
with open(summarized_texts_path, "r", encoding="utf-8") as f:
    lines = f.readlines()
    for i in range(0, len(lines), 3):
        index, filename = lines[i].strip().split('. ', 1)
        summary = lines[i+1].strip() if i + 1 < len(lines) else ""
        summarized_texts[filename.lower()] = summary

print("✅ Datasets Loaded Successfully!")
```

```
✅ Datasets Loaded Successfully!
```

```
from transformers import pipeline


qa_pipeline = pipeline("question-answering", model="distilbert-base-cased-distilled-squad")

def answer_question(question):
    best_answer = None
    highest_score = 0

    for filename, text in extracted_texts.items():
        if len(text) > 512:
            text = text[:512]

        response = qa_pipeline(question=question, context=text)
        score = response['score']

        if score > highest_score and score > 0.2:
            highest_score = score
            best_answer = response['answer']

    if best_answer:
        return best_answer
    else:
        return "Invalid question"
```

```
/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(
config.json: 100%                                                 473/473 [00:00<00:00, 37.1kB/s]
model.safetensors: 100%                                           261M/261M [00:01<00:00, 219MB/s]
tokenizer_config.json: 100%                                       49.0/49.0 [00:00<00:00, 3.54kB/s]
vocab.txt: 100%                                                   213k/213k [00:00<00:00, 6.50MB/s]
tokenizer.json: 100%                                              436k/436k [00:00<00:00, 27.5MB/s]
Device set to use cpu
```

```
import cv2
import numpy as np
from tensorflow.keras.applications.resnet50 import ResNet50, preprocess_input
from tensorflow.keras.preprocessing import image
from sklearn.metrics.pairwise import cosine_similarity
from google.colab import files

model = ResNet50(weights="imagenet", include_top=False, pooling="avg")

def extract_image_features(img_path):
    img = image.load_img(img_path, target_size=(224, 224))
    img_array = image.img_to_array(img)
    img_array = np.expand_dims(img_array, axis=0)
    img_array = preprocess_input(img_array)
    features = model.predict(img_array)
    return features.flatten()

def find_best_match(uploaded_img_path):
    uploaded_features = extract_image_features(uploaded_img_path)

    best_match = None
    highest_similarity = -1


    normalized_summaries = {os.path.splitext(k.strip().lower())[0]: v for k, v in summarized_texts.items()}

    for filename in normalized_summaries.keys():
        dataset_img_path = os.path.join("/content/drive/My Drive/Delta", filename)

        if not os.path.exists(dataset_img_path + ".png") and not os.path.exists(dataset_img_path + ".jpg"):
            continue

        dataset_features = extract_image_features(dataset_img_path + ".png" if os.path.exists(dataset_img_path + ".png") else dataset_img_pa

        similarity = cosine_similarity([uploaded_features], [dataset_features])[0][0]
        if similarity > highest_similarity:
            highest_similarity = similarity
            best_match = filename

    return best_match


def upload_image():
    uploaded = files.upload()
    uploaded_image_path = list(uploaded.keys())[0]
    return uploaded_image_path
```

```
Downloading data from https://storage.googleapis.com/tensorflow/keras-applications/resnet/resnet50_weights_tf_dim_ordering_tf_kernels_no
94765736/94765736 ━━━━━━━━━━━━━━━━━━━━ 1s 0us/step
```

```
from gtts import gTTS
import IPython.display as ipd

def speak_text(text):
    tts = gTTS(text=text, lang="en", slow=False)
    tts.save("output.mp3")
    ipd.display(ipd.Audio("output.mp3"))



print("📜 Available Extracted Text Filenames:")
for filename in extracted_texts.keys():
    print(f"- {filename}")
```

```
📜 Available Extracted Text Filenames:
- image: 0295655d-81ab-4fdf-a7d2-c4661cabe311.jpg
- image: 07f4739a-168f-4892-b145-adf82680d48f.jpg
- image: 097c1588-4bf1-4ea7-a4df-77ba98375e7b.jpg
- image: 0e8716f5-03a9-4a7f-aca9-e0941bb48442.jpg
- image: 0fd2c2fe-925b-4b05-bef1-693a6021b016.jpg
- image: 14f7bfdc-035f-433f-8813-47cbb4b1788b.jpg
- image: 153b9a74-3ae6-4767-989c-f94750a37537.jpg
- image: 156f1689-d2b2-4d3e-9de2-d1655ab4d0bf.jpg
- image: 16d19c83-04ec-4ac5-b2bf-1ff9d48b2574.jpg
- image: 1cd83eea-c0c0-4a40-acad-673fdbe4aa19.jpg
```

```
        - image: 1d212958-0179-4b1f-937d-5fd0bf67d245.jpg
        - image: 1d93bc_828126_6.jpg
        - image: 20498863-605e-4fce-a221-3968d55e6849.jpg
        - image: 250f116b-0c66-4c18-8ed5-f433ef1fdd7d.jpg
        - image: 299d81e6-cf2b-4ae7-b822-f59c7c7c1b5f.jpg
        - image: 2c3e3b58-2573-422c-a68c-da00f30284ed.jpg
        - image: 2ececbf7-d3e7-48b0-b6ba-c933406e23b2.jpg
        - image: 3229f3b3-be2b-406f-9973-cce4b04610b5.jpg
        - image: 34723886-20a8-41ff-bb06-34bcd57c7274.jpg
        - image: 353c1a48-41f2-4204-bc27-03f974ba048a.jpg
        - image: 37763f95-78bc-43e3-b8b7-2a34e9b05356.jpg
        - image: 38efae8e-bd89-4a5d-abd8-a34b66ce76f5.jpg
        - image: 3f78c247-b5e0-4741-a332-7c6b340f2c7f.jpg
        - image: 4a27b54c-96a0-406c-81bd-8babee8ad2b8.jpg
        - image: 4bb0d3e1-8380-4b4b-bf61-6353a5589610.jpg
        - image: 52fc5336-da3b-4eab-a2fc-6229b1c34354.jpg
        - image: 53e2c7ad-b789-4ab9-be1e-466a8cdaa1a0.jpg
        - image: 58a3283a-8103-446c-9214-0bed4e9619fa.jpg
        - image: 5b7e2cb3-8699-4bcf-b383-0cc7a57f79a7.jpg
        - image: 5bfaa385-4f2c-4162-843c-bd163f51cff6.jpg
        - image: 6f49695e-0955-401b-933d-f820d08f3ebf.jpg
        - image: 6fc28423-e2b3-4cfa-a297-5a61ec1a101e.jpg
        - image: 7c47c547-c9f1-442a-96a1-af51fdec26cf.jpg
        - image: 7cf88c93-a840-4b84-bd44-b99647fbe5d4.jpg
        - image: 84ef10f9-9049-4228-bac4-a25abdfbaa4b.jpg
        - image: 84f154d9-3bf2-46b2-95de-8ca87f5b4660.jpg
        - image: 88488777-d19a-4894-bf0c-a441b2bb266e.jpg
        - image: 89d9f132-e9e3-4a9f-96e2-1e63e656acb2.jpg
        - image: 8a0a89d0-752a-4ddf-bcae-dbb9d06c0dab.jpg
        - image: 8bfa8d81-0960-49dc-8d2a-f62555ea36aa.jpg
        - image: 8ce9daea-9e29-4e62-8a96-cc0f79b24594.jpg
        - image: 90b9d927-a9a9-4884-b08e-9e210b439adc.jpg
        - image: 91633083-b6ec-4843-852d-f5877cd21a7e.jpg
        - image: 9434addf-ea5c-4c70-96ba-8728a90ae99a.jpg
        - image: 97992464-017b-4914-a48a-405795dd9baf.jpg
        - image: 97d5c13f-aebc-4d5a-bd99-84a824343bba.jpg
        - image: 99a39638-06e8-4bc0-9eb9-021da09246e6 (1).jpg
        - image: 99a39638-06e8-4bc0-9eb9-021da09246e6.jpg
        - image: 99f3abd1-a313-43b6-83b6-6e0c111d1398.jpg
        - image: 9fb54b4e-80e9-443f-b96f-8fec309936af.jpg
        - image: epaper-international_02-01-2025_g0ldpvv2r.1.png
        - image: epaper-international_02-01-2025_g0ldpvv35.1.png
        - image: screenshot 2024-12-27 173150.png
        - image: screenshot 2024-12-27 173255.png
        - image: screenshot 2024-12-27 174935.png
        - image: screenshot 2024-12-27 175821.png
        - image: screenshot 2024-12-27 175845.png

    def chatbot():
        while True:
            user_input = input("🤖 Ask a question or type 'upload' to upload an image (or 'exit' to quit): ").strip().lower()

            if user_input == "exit":
                speak_text("Goodbye! Have a great day.")
                break

            elif user_input == "upload":
                image_path = upload_image()
                matched_image = find_best_match(image_path)

                if matched_image:
                    summary = summarized_texts.get(matched_image.lower(), "No matching summary found.")
                    speak_text(f"Here is the summary for the uploaded image: {summary}")
                else:
                    speak_text("No matching image found.")

            else:
                answer = answer_question(user_input)

                if answer and answer != "Invalid question":
                    speak_text(answer)
                else:
                    speak_text("Invalid question.")

    chatbot()
```

```
Ask a question or type 'upload' to upload an image (or 'exit' to quit): upload
```

Choose Files No file chosen Upload widget is only available when the cell has been executed in the current browser session. Please rerun this cell to enable.

```
Saving Screenshot 2025-02-10 145726.png to Screenshot 2025-02-10 145726.png
1/1 ━━━━━━━━━━━━━━━━━━━━ 4s 4s/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 208ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 204ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 204ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 221ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 208ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 229ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 205ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 212ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 207ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 213ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 220ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 203ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 203ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 310ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 356ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 363ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 357ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 208ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 230ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 210ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 210ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 208ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 207ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 217ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 229ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 203ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 204ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 203ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 202ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 225ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 214ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 355ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 360ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 354ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 254ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 241ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 221ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 205ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 234ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 209ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 204ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 216ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 202ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 211ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 209ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 225ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 206ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 204ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 208ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 357ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 346ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 344ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 327ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 203ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 204ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 210ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 206ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 209ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 204ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 206ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 220ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 203ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 208ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 221ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 204ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 209ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 201ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 233ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 357ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 363ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 347ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 214ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 222ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 222ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 207ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 208ms/step
```

0:00 / 0:05