

```
# =====
# STEP 1: Install required libraries
# =====
!pip install diffusers transformers accelerate safetensors pillow matplotlib

# =====
# STEP 2: Imports
# =====
from diffusers import AutoPipelineForText2Image
import torch
import os
import matplotlib.pyplot as plt

# =====
# STEP 3: Load lightweight Stable Diffusion (CPU safe)
# =====
pipe = AutoPipelineForText2Image.from_pretrained(
    "stabilityai/sd-turbo",
    torch_dtype=torch.float32
)

pipe = pipe.to("cpu")
pipe.enable_attention_slicing()

# =====
# STEP 4: Create dataset directory
# =====
dataset_dir = "xray_dataset"
os.makedirs(dataset_dir, exist_ok=True)

# =====
# STEP 5: Disease labels (LIST)
# =====
labels = [
    "lung_cancer",
    "fracture",
    "pneumonia",
    "tuberculosis",
    "normal"
]

# Corresponding X-ray prompts
prompts = {
    "lung_cancer": "realistic chest x-ray showing lung cancer tumor, grayscale medical x-ray",
    "fracture": "x-ray image of fractured human bone, broken arm, orthopedic radiograph",
    "pneumonia": "chest x-ray showing pneumonia infection, cloudy lungs, radiology scan",
    "tuberculosis": "chest x-ray showing tuberculosis, lung lesions, medical radiograph",
    "normal": "normal healthy chest x-ray, clear lungs, medical radiograph"
}

# =====
# STEP 6: Generate X-ray images
# =====
IMAGES_PER_LABEL = 3 # can change to 5 if needed

for label in labels:
    label_path = os.path.join(dataset_dir, label)
    os.makedirs(label_path, exist_ok=True)

    for i in range(1, IMAGES_PER_LABEL + 1):
        image = pipe(
            prompts[label],
            num_inference_steps=2,
            guidance_scale=0.0
        ).images[0]

        image_file = f"{label}_{i}.png"
        image.save(os.path.join(label_path, image_file))
```

```
# Display image
plt.imshow(image, cmap="gray")
plt.axis("off")
plt.title(f"{label} - Image {i}")
plt.show()

print("✅ X-RAY DATASET GENERATED SUCCESSFULLY")
```



```

Requirement already satisfied: diffusers in /usr/local/lib/python3.12/dist-packages (0.36.0)
Requirement already satisfied: transformers in /usr/local/lib/python3.12/dist-packages (4.57.3)
Requirement already satisfied: accelerate in /usr/local/lib/python3.12/dist-packages (1.12.0)
Requirement already satisfied: safetensors in /usr/local/lib/python3.12/dist-packages (0.7.0)
Requirement already satisfied: pillow in /usr/local/lib/python3.12/dist-packages (11.3.0)
Requirement already satisfied: matplotlib in /usr/local/lib/python3.12/dist-packages (3.10.0)
Requirement already satisfied: importlib_metadata in /usr/local/lib/python3.12/dist-packages (from diffusers)
Requirement already satisfied: filelock in /usr/local/lib/python3.12/dist-packages (from diffusers) (3.4.0)
Requirement already satisfied: httpx<1.0.0 in /usr/local/lib/python3.12/dist-packages (from diffusers)
Requirement already satisfied: huggingface-hub<2.0,>=0.34.0 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: numpy in /usr/local/lib/python3.12/dist-packages (from diffusers) (2.0.2)
Requirement already satisfied: regex!=2019.12.17 in /usr/local/lib/python3.12/dist-packages (from diffusers)
Requirement already satisfied: requests in /usr/local/lib/python3.12/dist-packages (from diffusers) (2.31.0)
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.12/dist-packages (from transformers)
Requirement already satisfied: pyyaml>=5.1 in /usr/local/lib/python3.12/dist-packages (from transformers)
Requirement already satisfied: tokenizers<=0.23.0,>=0.22.0 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: tqdm>=4.27 in /usr/local/lib/python3.12/dist-packages (from transformers)
Requirement already satisfied: psutil in /usr/local/lib/python3.12/dist-packages (from accelerate) (5.9.3)
Requirement already satisfied: torch>=2.0.0 in /usr/local/lib/python3.12/dist-packages (from accelerate)
Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.12/dist-packages (from matplotlib)
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.12/dist-packages (from matplotlib)
Requirement already satisfied: fonttools>=4.22.0 in /usr/local/lib/python3.12/dist-packages (from matplotlib)
Requirement already satisfied: kiwisolver>=1.3.1 in /usr/local/lib/python3.12/dist-packages (from matplotlib)
Requirement already satisfied: pyparsing>=2.3.1 in /usr/local/lib/python3.12/dist-packages (from matplotlib)
Requirement already satisfied: python-dateutil>=2.7 in /usr/local/lib/python3.12/dist-packages (from matplotlib)
Requirement already satisfied: anyio in /usr/local/lib/python3.12/dist-packages (from httpx<1.0.0->diffusers)
Requirement already satisfied: certifi in /usr/local/lib/python3.12/dist-packages (from httpx<1.0.0->diffusers)
Requirement already satisfied: httpcore==1.* in /usr/local/lib/python3.12/dist-packages (from httpx<1.0.0->diffusers)
Requirement already satisfied: idna in /usr/local/lib/python3.12/dist-packages (from httpx<1.0.0->diffusers)
Requirement already satisfied: h11>=0.16 in /usr/local/lib/python3.12/dist-packages (from httpcore==1.*)
Requirement already satisfied: fsspec>=2023.5.0 in /usr/local/lib/python3.12/dist-packages (from hugger)
Requirement already satisfied: typing-extensions>=3.7.4.3 in /usr/local/lib/python3.12/dist-packages (from hugger)
Requirement already satisfied: hf-xet<2.0.0,>=1.1.3 in /usr/local/lib/python3.12/dist-packages (from hugger)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.12/dist-packages (from python-dateutil)
Requirement already satisfied: setuptools in /usr/local/lib/python3.12/dist-packages (from torch>=2.0.0)
Requirement already satisfied: sympy>=1.13.3 in /usr/local/lib/python3.12/dist-packages (from torch>=2.0.0)
Requirement already satisfied: networkx>=2.5.1 in /usr/local/lib/python3.12/dist-packages (from torch>=2.0.0)
Requirement already satisfied: jinja2 in /usr/local/lib/python3.12/dist-packages (from torch>=2.0.0->accelerate)
Requirement already satisfied: nvidia-cuda-nvrtc-cu12==12.6.77 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: nvidia-cuda-runtime-cu12==12.6.77 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: nvidia-cuda-cupti-cu12==12.6.80 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: nvidia-cudnn-cu12==9.10.2.21 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: nvidia-cUBLAS-cu12==12.6.4.1 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: nvidia-cufft-cu12==11.3.0.4 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: nvidia-curand-cu12==10.3.7.77 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: nvidia-cusolver-cu12==11.7.1.2 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: nvidia-cusparse-cu12==12.5.4.2 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: nvidia-cusparseelt-cu12==0.7.1 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: nvidia-nccl-cu12==2.27.5 in /usr/local/lib/python3.12/dist-packages (from torch)
Requirement already satisfied: nvidia-nvshmem-cu12==3.3.20 in /usr/local/lib/python3.12/dist-packages (from torch)
Requirement already satisfied: nvidia-nvtx-cu12==12.6.77 in /usr/local/lib/python3.12/dist-packages (from torch)
Requirement already satisfied: nvidia-nvjitlink-cu12==12.6.85 in /usr/local/lib/python3.12/dist-packages (from torch)
Requirement already satisfied: nvidia-cufile-cu12==1.11.1.6 in /usr/local/lib/python3.12/dist-packages (from torch)
Requirement already satisfied: triton==3.5.0 in /usr/local/lib/python3.12/dist-packages (from torch>=2.0.0)
Requirement already satisfied: zipp>=3.20 in /usr/local/lib/python3.12/dist-packages (from importlib_metadata)
Requirement already satisfied: charset_normalizer<4,>=2 in /usr/local/lib/python3.12/dist-packages (from torch)
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.12/dist-packages (from torch)
Requirement already satisfied: mpmath<1.4,>=1.1.0 in /usr/local/lib/python3.12/dist-packages (from sympy)
Requirement already satisfied: MarkupSafe>=2.0 in /usr/local/lib/python3.12/dist-packages (from jinja2)

```

Loading pipeline components...: 100%

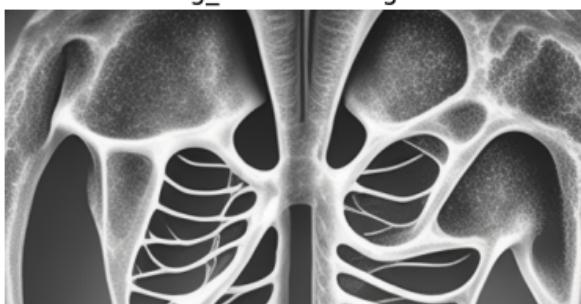
5/5 [00:00<00:00, 13.02it/s]

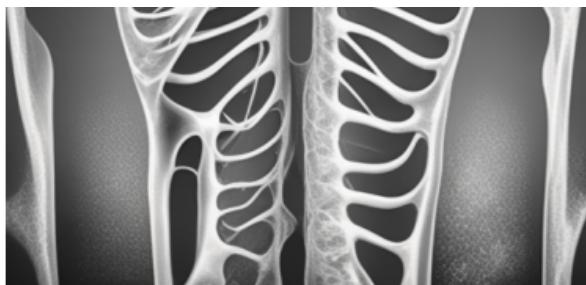
You have disabled the safety checker for <class 'diffusers.pipelines.stable_diffusion.pipeline_stable_diffusion'>

100%

2/2 [00:23<00:00, 11.79s/it]

lung_cancer - Image 1

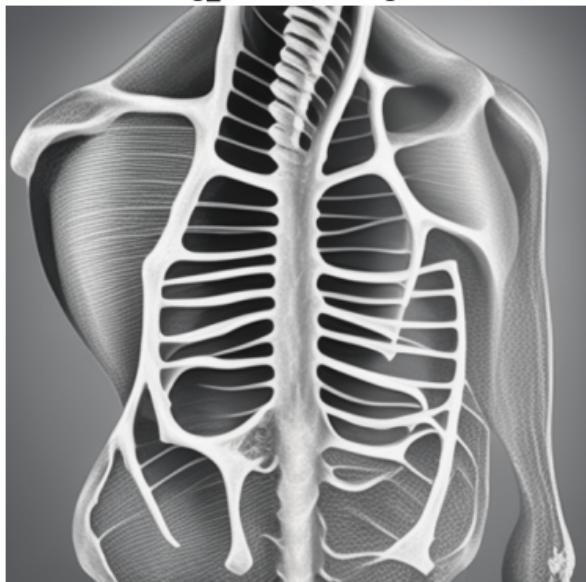




100%

2/2 [00:23<00:00, 11.68s/it]

lung_cancer - Image 2



100%

2/2 [00:21<00:00, 10.88s/it]

lung_cancer - Image 3



100%

2/2 [00:21<00:00, 10.81s/it]

fracture - Image 1





100%

2/2 [00:25<00:00, 13.27s/it]

fracture - Image 2



100%

2/2 [00:21<00:00, 10.89s/it]

fracture - Image 3



100%

2/2 [00:22<00:00, 11.39s/it]

pneumonia - Image 1





100%

2/2 [00:21<00:00, 10.85s/it]

pneumonia - Image 2

100%

2/2 [00:21<00:00, 10.90s/it]

pneumonia - Image 3

100%

2/2 [00:21<00:00, 10.93s/it]

tuberculosis - Image 1

```
import shutil  
  
shutil.make_archive("xray_dataset", "zip", "xray_dataset")
```

```
'/content/xray_dataset.zip'
```

100%

2/2 [00:22<00:00, 11.00s/it]

tuberculosis - Image 2

