Ex.No.8 Reproducing an Existing Image Using Text-to-Image AI Tools

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Aim:
The aim of this experiment is to demonstrate the capability of text-to-image generation tools to recreate an existing image by crafting precise and descriptive prompts. The objective is to analyze key visual elements in the original image and use them to guide the AI model in generating an image that closely resembles it.

Softwares Required:
1. Python (3.8+)
2. **IDE:** Jupyter Notebook or VS Code
3. **Python Libraries:** requests, PIL (for image handling)
4. **Text-to-Image AI Tools:** DALL-E by OpenAI, Stable Diffusion by Hugging Face
5. **API Keys:** Required for OpenAI and Hugging Face.

Experiment Design:
1.   **Image Analysis:** Choose an existing image and identify its key
elements: **Objects:** Main items in the image (e.g., people, animals,
buildings). **Background:** Details of the environment (e.g., sky, landscape,
interior). **Colors:** Dominant color palette (e.g., bright, muted, pastel tones).
Style: Artistic style or realism (e.g., sketch, photorealistic, abstract).
2.   **Prompt Crafting:** Write a detailed prompt using the identified elements to describe the image.
3.   **Image Generation:** Use the crafted prompt with a text-to-image AI model (DALL-E or Stable
Diffusion) to generate an image.

Code:
Python Code for Text-to-Image Generation
```
import openai
from PIL import Image
import requests
from io import
BytesIO # OpenAI API
Key
openai.api_key = "your_openai_api_key"
# Function to generate image using
DALL-E def generate_image(prompt):
response =
openai.Image.create(
prompt=prompt,
n=1, # Number of images to
generate size="1024x1024" # Image
size
```

```
)i
mage_url =
response['data'][0]['url'] return
image_url
# Analyzing the image and crafting a prompt
# Example Image Description:
# "A calm beach scene during sunset with a clear sky, golden sun, waves gently crashing, and
a
# silhouette of a lone person standing on the shore."
prompt = (
"A calm beach scene during sunset with a clear sky, golden sun, waves gently crashing,
and "
"a silhouette of a lone person standing on the shore."
)
# Generating the Image
image_url = generate_image(prompt)
# Fetching and Displaying the Generated
Image response = requests.get(image_url)
img = Image.open(BytesIO(response.content))
img.show()
# Print the URL of the generated image
print("Generated Image URL:", image_url)
```

Output and Result:
The AI tool generates an image based on the provided prompt. Compare the generated image
with the original to assess:
- o **Similarity:** How closely the generated image resembles the original.
- o **Key Element Reproduction:** Whether the main objects, colors, and scene elements
  were accurately reproduced.
- o **Quality:** The resolution, clarity, and artistic quality of the generated image.

Conclusion:
This experiment demonstrates that the quality and similarity of AI-generated images heavily
depend on the precision of the crafted prompt. Tools like DALL-E and Stable Diffusion show
promise in recreating existing visuals, particularly when detailed and descriptive prompts are
used.