

```
In [7]: from PIL import Image
import numpy as np
import matplotlib.pyplot as plt
```

```
In [2]: def encrypt_image(image_path, key, output_path):
    image = Image.open(image_path)
    np_image = np.array(image)

    # Simple pixel manipulation: add the key to each pixel value and take modulo 256
    encrypted_np_image = (np_image + key) % 256

    encrypted_image = Image.fromarray(encrypted_np_image.astype(np.uint8))
    encrypted_image.save(output_path)
    print(f"Image encrypted and saved as {output_path}")

    return encrypted_image
```

```
In [3]: def decrypt_image(image_path, key, output_path):
    image = Image.open(image_path)
    np_image = np.array(image)

    # Reverse the pixel manipulation: subtract the key from each pixel value and take modulo 256
    decrypted_np_image = (np_image - key) % 256

    decrypted_image = Image.fromarray(decrypted_np_image.astype(np.uint8))
    decrypted_image.save(output_path)
    print(f"Image decrypted and saved as {output_path}")

    return decrypted_image
```

```
In [4]: def display_images(original_image, encrypted_image, decrypted_image):
    fig, axes = plt.subplots(1, 3, figsize=(15, 5))
    axes[0].imshow(original_image)
    axes[0].set_title("Original Image")
    axes[0].axis('off')

    axes[1].imshow(encrypted_image)
    axes[1].set_title("Encrypted Image")
    axes[1].axis('off')

    axes[2].imshow(decrypted_image)
    axes[2].set_title("Decrypted Image")
    axes[2].axis('off')

    plt.show()
```

```
In [5]: def main():
    print("Image Encryption Tool")
    image_path = input("Enter the path to the image: ")
    key = int(input("Enter the encryption/decryption key (integer): "))

    encrypted_output_path = "encrypted_image.png"
    decrypted_output_path = "decrypted_image.png"

    # Encrypt the image
    encrypted_image = encrypt_image(image_path, key, encrypted_output_path)

    # Decrypt the image
    decrypted_image = decrypt_image(encrypted_output_path, key, decrypted_output_path)

    # Load the original image for display
    original_image = Image.open(image_path)

    # Display the images
    display_images(original_image, encrypted_image, decrypted_image)
```

```
In [8]: main()
```

```
Image Encryption Tool
Enter the path to the image: shree ram.jpg
Enter the encryption/decryption key (integer): 42
Image encrypted and saved as encrypted_image.png
Image decrypted and saved as decrypted_image.png
```

Original Image



Encrypted Image



Decrypted Image



```
In [ ]:
```