10)Perform a 90-degree rotation clockwise along the y-axis for the given image.

CODE:

```
import cv2

import numpy as np


# Load the image

image = cv2.imread(r"C:\Users\harik\Downloads\CV LAB\MOUNTAIN.jpeg")  # Replace with your image path

h, w = image.shape[:2]


# Simulate Y-axis rotation by warping the image

# Define 3D rotation parameters

d = 500  # Distance from the camera (adjust for perspective depth)

alpha = np.deg2rad(90)  # 90 degrees in radians


# Projection matrix (3D to 2D perspective)

A1 = np.array([[1, 0, -w/2],

               [0, 1, -h/2],

               [0, 0,    0],

               [0, 0,    1]])


# Rotation matrix around Y-axis

R = np.array([[ np.cos(alpha), 0, -np.sin(alpha), 0],

              [          0, 1,           0, 0],

              [ np.sin(alpha), 0,  np.cos(alpha), 0],

              [          0, 0,           0, 1]])


# Translate the image back after rotation

T = np.array([[1, 0, 0, w/2],
```

```
        [0, 1, 0, h/2],
        [0, 0, 1,   0],
        [0, 0, 0,   1]])

# Combine transformations
M = T @ R @ A1

# Apply perspective warp
M = M[:3]  # Keep the 3x4 matrix for warpPerspective
rotated_image = cv2.warpPerspective(image, M, (w, h))

# Show the result
cv2.imshow('Rotated 90 Degrees Y-axis Clockwise', rotated_image)
cv2.waitKey(0)
cv2.destroyAllWindows()
```

OUTPUT: