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OpenCV Canny Edge Detection

Edge detection is term where identify the boundary of object in image. We will learn about the edge detection using the canny edge detection technique. The syntax is canny edge detection function is given as:

```
edges = cv2.Canny('/path/to/img', minVal, maxVal, apertureSize, L2gradient)
```

Parameters-

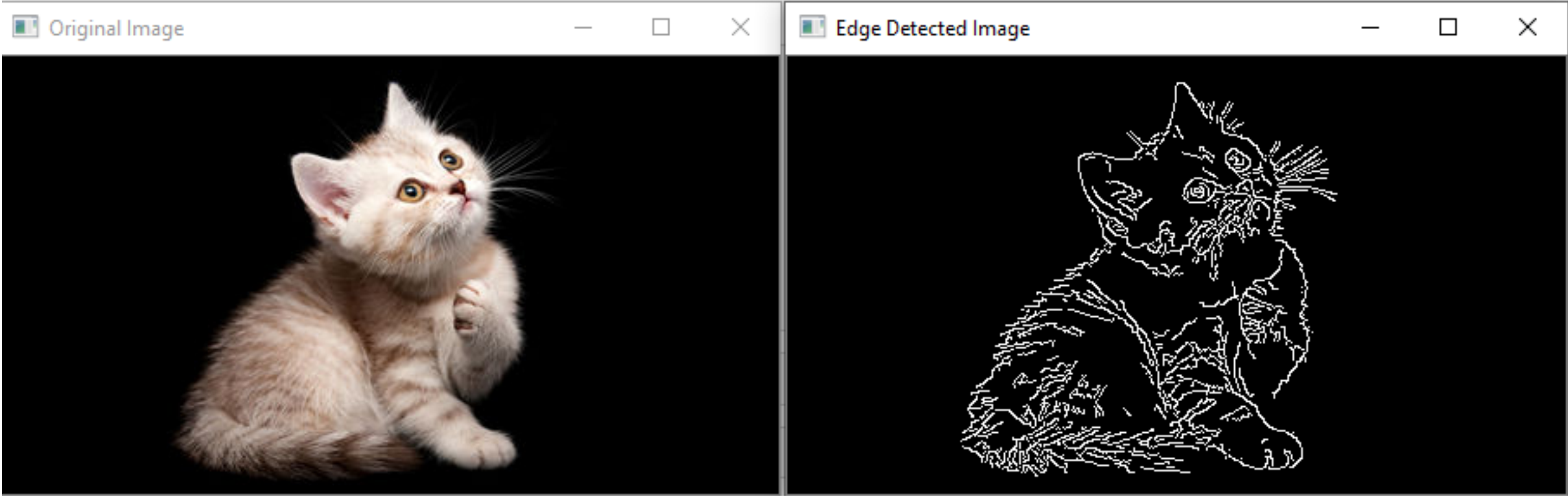
- /path/to/img:** file path of the image (required)
- minVal:** Minimum intensity gradient (required)
- maxVal:** Maximum intensity gradient (required)
- aperture:** It is optional argument.
- L2gradient:** Its default value is false, if value is true, Canny () uses a more computationally expensive equation to detect edges, which provides more accuracy at the cost of resources.

Example: 1

```
import cv2
img = cv2.imread(r"C:\Users\DEVANSH SHARMA\cat_16x9.jpg")
edges = cv2.Canny(img, 100, 200)

cv2.imshow("Edge Detected Image", edges)
cv2.imshow("Original Image", img)
cv2.waitKey(0) # waits until a key is pressed
cv2.destroyAllWindows() # destroys the window showing image
```

Output:



Example: Real Time Edge detection

```
# import libraries of python OpenCV
import cv2

# import Numpy by alias name np
import numpy as np

# capture frames from a camera
cap = cv2.VideoCapture(0)

# loop runs if capturing has been initialized
while (1):

    # reads frames from a camera
    ret, frame = cap.read()

    # converting BGR to HSV
    hsv = cv2.cvtColor(frame, cv2.COLOR_BGR2HSV)
    # define range of red color in HSV
    lower_red = np.array([30, 150, 50])
    upper_red = np.array([255, 255, 180])

    # create a red HSV colour boundary and
    # threshold HSV image
    mask = cv2.inRange(hsv, lower_red, upper_red)

    # Bitwise-AND mask and original image
    res = cv2.bitwise_and(frame, frame, mask=mask)

    # Display an original image
    cv2.imshow("Original", frame)

    # discovers edges in the input image image and
    # marks them in the output map edges
    edges = cv2.Canny(frame, 100, 200)

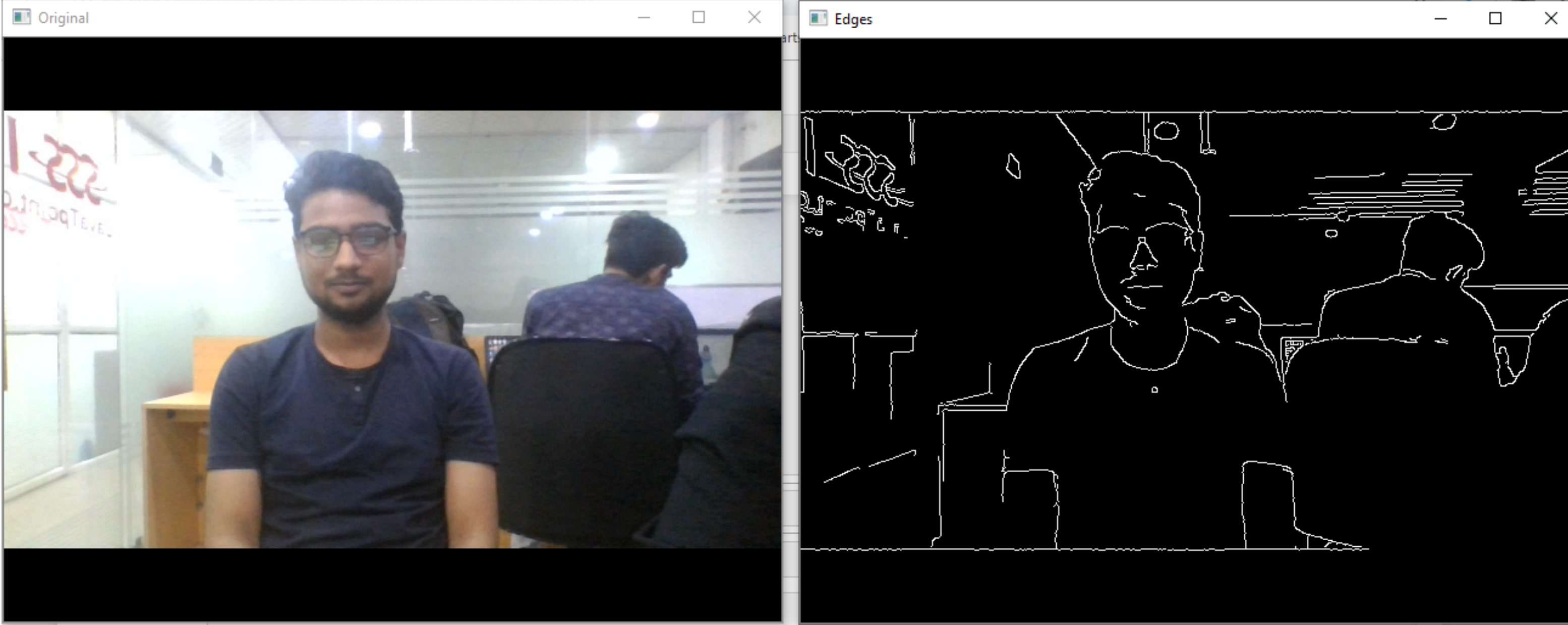
    # Display edges in a frame
    cv2.imshow('Edges', edges)

    # Wait for Esc key to stop
    k = cv2.waitKey(5) & 0xFF
    if k == 27:
        break

# Close the window
cap.release()

# De-allocate any associated memory usage
cv2.destroyAllWindows()
```

Output:



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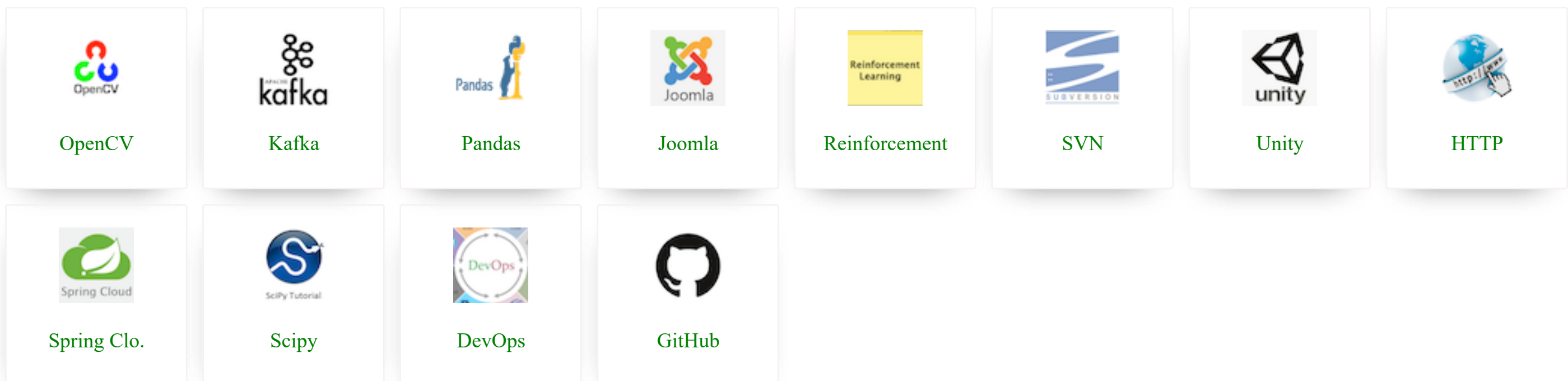
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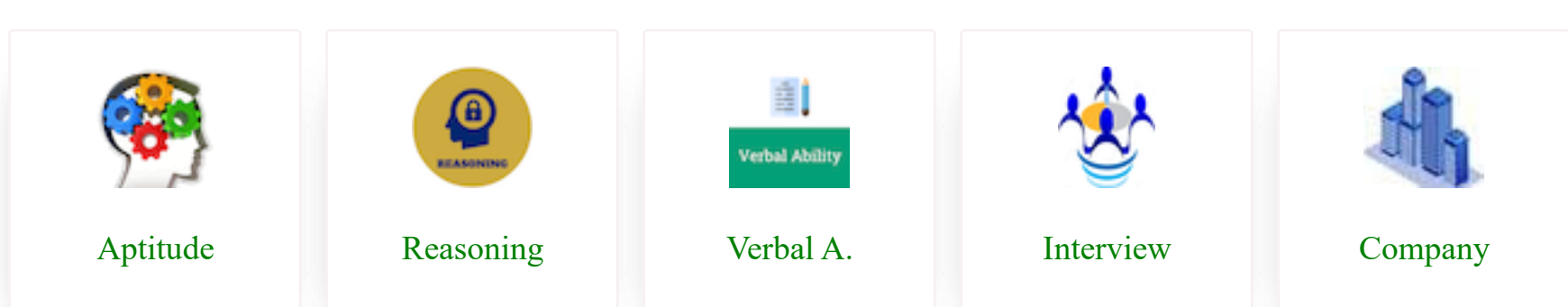
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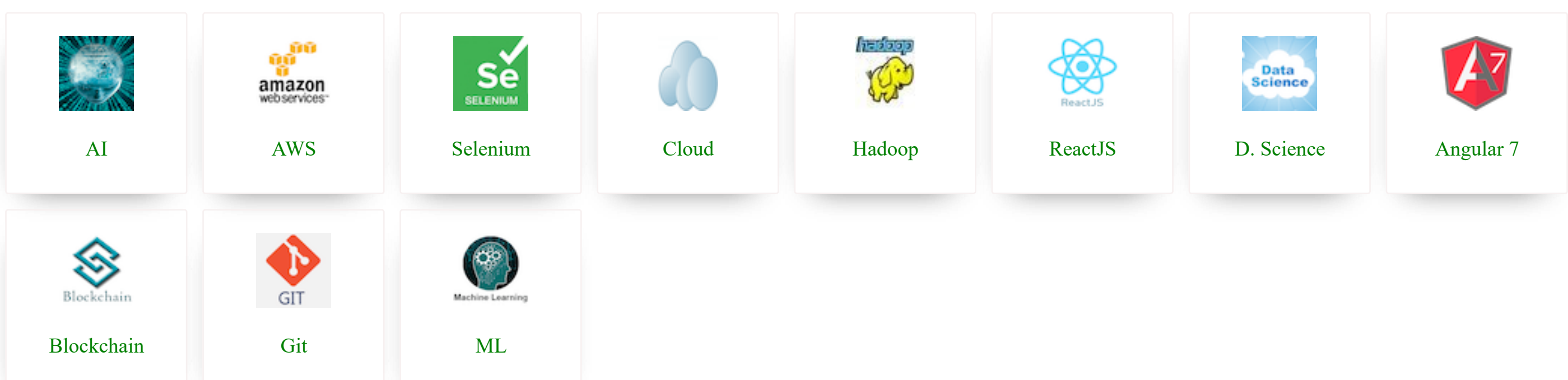
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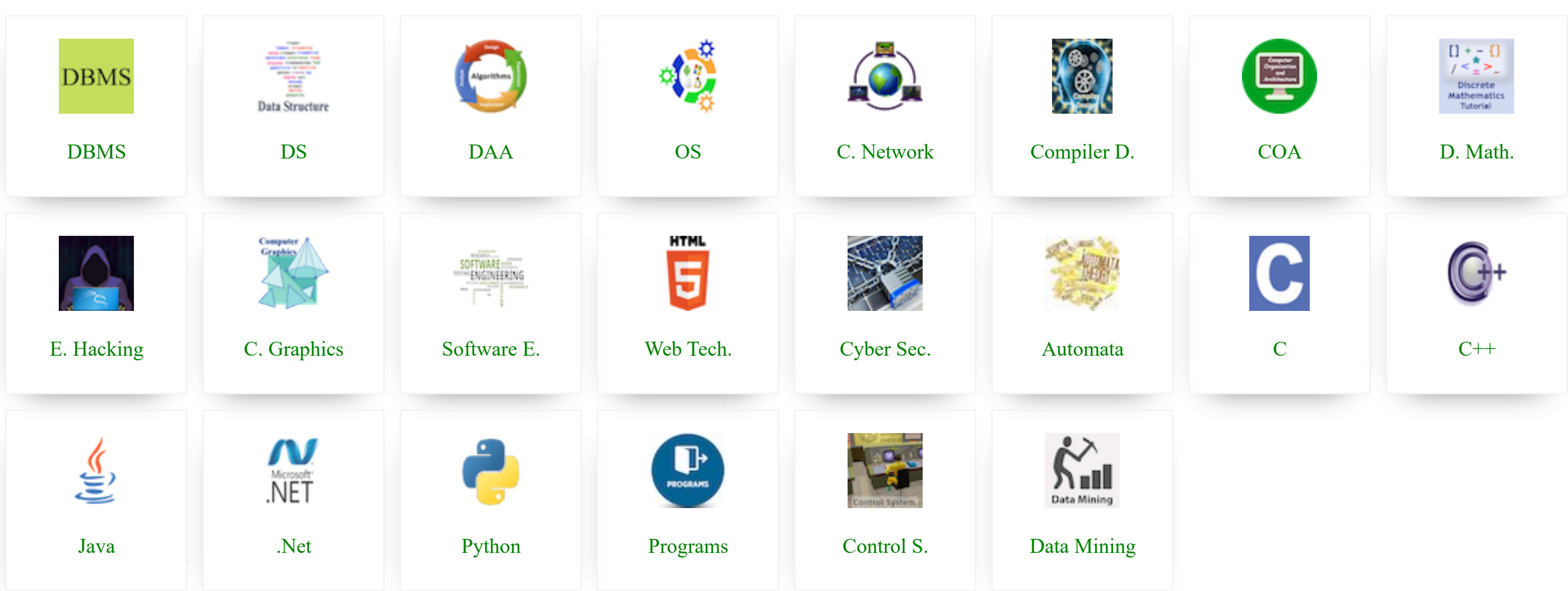
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