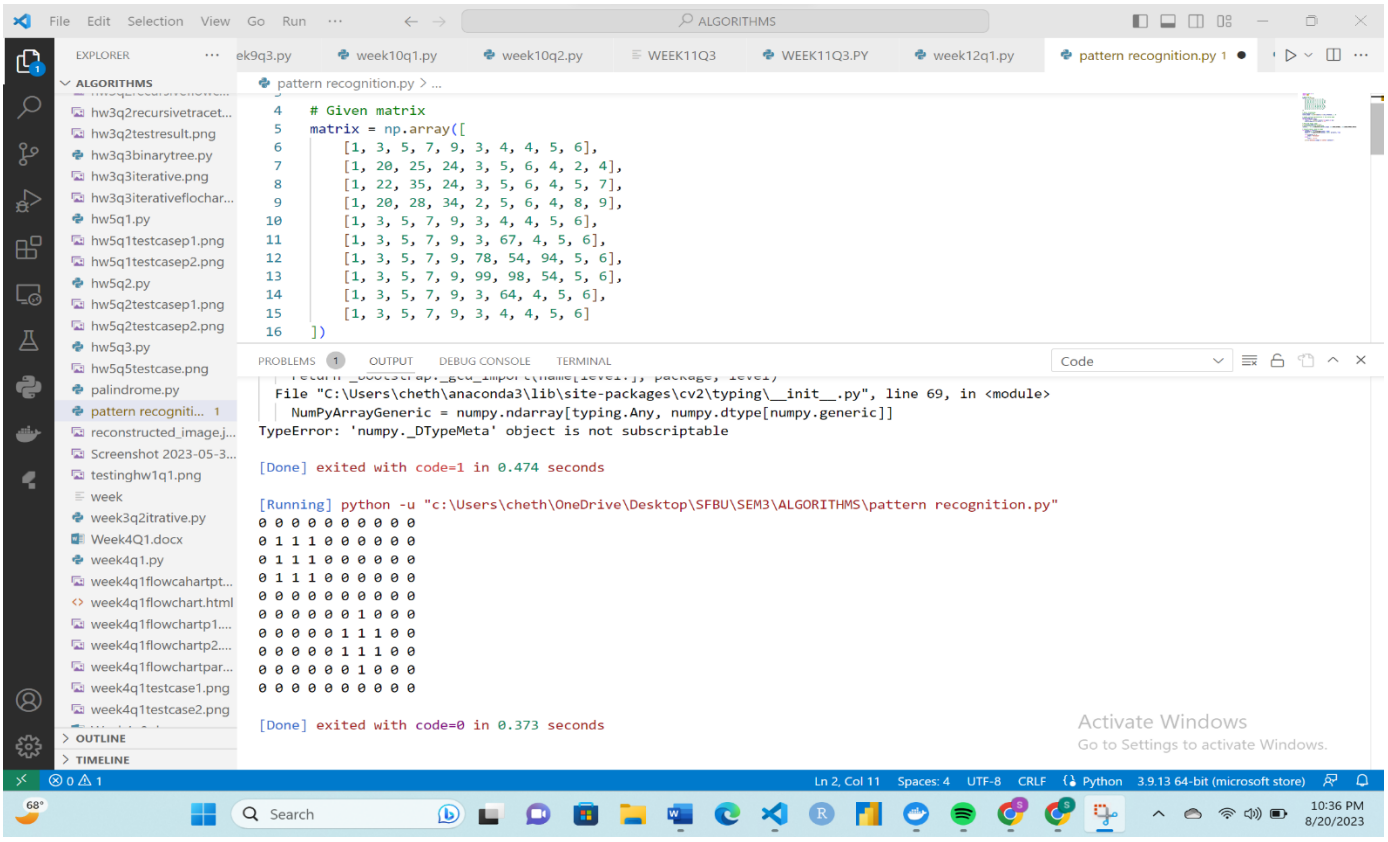
Pattern recognition

```
import numpy as np
import cv2
# Given matrix
matrix = np.array([
    [1, 3, 5, 7, 9, 3, 4, 4, 5, 6],
    [1, 20, 25, 24, 3, 5, 6, 4, 2, 4],
    [1, 22, 35, 24, 3, 5, 6, 4, 5, 7],
    [1, 20, 28, 34, 2, 5, 6, 4, 8, 9],
    [1, 3, 5, 7, 9, 3, 4, 4, 5, 6],
    [1, 3, 5, 7, 9, 3, 67, 4, 5, 6],
    [1, 3, 5, 7, 9, 78, 54, 94, 5, 6],
    [1, 3, 5, 7, 9, 99, 98, 54, 5, 6],
    [1, 3, 5, 7, 9, 3, 64, 4, 5, 6],
    [1, 3, 5, 7, 9, 3, 4, 4, 5, 6]
])

# Otsu's thresholding
otsu_threshold = 20
binary_image = np.where(matrix >= otsu_threshold, 1, 0)

# Create a string representation of the binary image
binary_image_str = ""
for row in binary_image:
    row_str = " ".join(str(pixel) for pixel in row)
    binary_image_str += row_str + "\n"

# Print the binary image
print(binary_image_str.strip())



# Find contours in the binary image
contours, _ = cv2.findContours(binary_image, cv2.RETR_EXTERNAL,
cv2.CHAIN_APPROX_SIMPLE)

# Classify objects based on shape
for contour in contours:
    perimeter = cv2.arcLength(contour, True)
    approx = cv2.approxPolyDP(contour, 0.04 * perimeter, True)

    if len(approx) == 4:
        shape = "Rectangle"
```

```
    else:
        shape = "Circle"

    print(f"Detected {shape} at contour {contour}")
```

1	3	5	7	9	3	4	5	5	6
1	20	25	24	3	5	6	4	2	4
1	22	35	24	3	5	6	4	5	7
1	20	28	34	2	5	6	4	8	9
1	3	5	7	9	3	4	4	5	6
1	3	5	7	9	3	27	4	5	6
1	3	5	7	9	28	24	24	5	6
1	3	5	7	9	29	28	24	5	6
1	3	5	7	9	3	24	4	5	6
1	3	5	7	9	3	4	4	5	6


File Edit Selection View Go Run
ALGORITHMS
EXPLORER
week10q1.py
week10q2.py
WEEK11Q3
WEEK11Q3.PY
week12q1.py
pattern recognition.py 1
pattern recognition.py > ...
# Given matrix
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[1, 3, 5, 7, 9, 3, 64, 4, 5, 6],
[1, 3, 5, 7, 9, 3, 4, 4, 5, 6]
])
PROBLEMS 1
OUTPUT
DEBUG CONSOLE
TERMINAL
Code
File "C:\Users\cheth\anaconda3\lib\site-packages\cv2\typing__init__.py", line 69, in <module>
NumPyArrayGeneric = numpy.ndarray[typing.Any, numpy.dtype[numpy.generic]]
TypeError: 'numpy._DTypeMeta' object is not subscriptable
[Done] exited with code=1 in 0.474 seconds
[Running] python -u "c:\Users\cheth\OneDrive\Desktop\SFBU\SEM3\ALGORITHMS\pattern recognition.py"
0 0 0 0 0 0 0 0 0 0
0 1 1 1 0 0 0 0 0 0
0 1 1 1 0 0 0 0 0 0
0 1 1 1 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 1 0 0 0
0 0 0 0 0 1 1 1 0 0
0 0 0 0 0 1 1 1 0 0
0 0 0 0 0 0 1 0 0 0
0 0 0 0 0 0 0 0 0 0
[Done] exited with code=0 in 0.373 seconds
Activate Windows
Go to Settings to activate Windows.
OUTLINE
TIMELINE
Ln 2, Col 11
Spaces: 4
UTF-8
CRLF
Python
3.9.13 64-bit (microsoft store)
Search
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