"""

Write a program in python to find transpose and find diagonal elements of a matrix.

Hanif 231P044 / 01

"""

```
import numpy as np

# Input matrix

matrix = np.array([[1, 2, 3],

                   [4, 5, 6],

                   [7, 8, 9]])

# Finding transpose

transpose_matrix = np.transpose(matrix)

# Finding diagonal elements

diagonal_elements = np.diagonal(matrix)

# Display results

print("Original Matrix:")

print(matrix)

print("\nTranspose of Matrix:")

print(transpose_matrix)

print("\nDiagonal Elements:")

print(diagonal_elements)
```

Output:

```
Original Matrix:
[[1 2 3]
 [4 5 6]
 [7 8 9]]

Transpose of Matrix:
[[1 4 7]
 [2 5 8]
 [3 6 9]]

Diagonal Elements:
[1 5 9]
```

13b.

"""

Write a program to perform matrix multiplication?

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"""

```
import numpy as np
# Define two matrices
A = np.array([[1, 2, 3],
              [4, 5, 6],
              [7, 8, 9]])
B = np.array([[9, 8, 7],
              [6, 5, 4],
              [3, 2, 1]])
# Perform matrix multiplication
result = np.dot(A, B)
# Display matrices and result

print("Matrix A:")
print(A)
print("\nMatrix B:")
print(B)
print("\nMatrix Multiplication Result (A x B):")
print(result)
```

Output:

```
Matrix A:
[[1 2 3]
 [4 5 6]
 [7 8 9]]

Matrix B:
[[9 8 7]
 [6 5 4]
 [3 2 1]]

Matrix Multiplication Result (A x B):
[[ 30  24  18]
 [ 84  69  54]
 [138 114  90]]
```

13c.

"""

Write a program to perform transpose of a matrix?

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"""

```
import numpy as np

# Define two matrices

A = np.array([[1, 2, 3],

        [4, 5, 6],

        [7, 8, 9]])

B = np.array([[9, 8, 7],

        [6, 5, 4],

        [3, 2, 1]])

# Perform matrix multiplication

result = np.dot(A, B)

# Display matrices and result

print("Matrix A:")
```

```
print(A)
print("\nMatrix B:")
print(B)
print("\nMatrix Multiplication Result (A x B):")
print(result)
```

Output:

```
Original Matrix:
[[1 2 3]
 [4 5 6]
 [7 8 9]]

Transpose of the Matrix:
[[1 4 7]
 [2 5 8]
 [3 6 9]]
```