Task1:

```python
A = [
    [2, 4, 6],
    [8, 0, 1],
    [3, 5, 7]
    ]

A.append([10, 11, 12])
print(A)


col = [13, 14, 15, 16]
for i in range(len(A)):
    A[i].append(col[i])
print(A)


A.insert(1, [16, 17, 18, 20])
print(A)


col2 = [19, 20, 21, 22, 23]
for i in range(len(A)):
    A[i].insert(2, col2[i])
print(A)
```

Output:

```
PS D:\Internship\Day4> python task1.py
[[2, 4, 6], [8, 0, 1], [3, 5, 7], [10, 11, 12]]
[[2, 4, 6, 13], [8, 0, 1, 14], [3, 5, 7, 15], [10, 11, 12, 16]]
[[2, 4, 6, 13], [16, 17, 18, 20], [8, 0, 1, 14], [3, 5, 7, 15], [10, 11, 12, 16]]
[[2, 4, 19, 6, 13], [16, 17, 20, 18, 20], [8, 0, 21, 1, 14], [3, 5, 22, 7, 15], [10, 11, 23, 12, 16]]
```

Task2:

```python
m = [
    [1, 2, 3, 4],
    [5, 6, 7, 8],
    [9, 10, 11, 12],
    [13, 14, 15, 16]
]


print(m[1])


print([row[2] for row in m])


print(m[2], m[3])


print([row[:2] for row in m])


print(m[2][1:], m[3][1:])


print([m[1][0], m[1][3]], [m[3][0], m[3][3]])


print([m[i][i] for i in range(len(m))])


print([m[i][3-i] for i in range(len(m))])
```

<u>Output:</u>

```
PS D:\Internship\Day4> python task2.py
[5, 6, 7, 8]
[3, 7, 11, 15]
[9, 10, 11, 12] [13, 14, 15, 16]
[[1, 2], [5, 6], [9, 10], [13, 14]]
[10, 11, 12] [14, 15, 16]
[5, 8] [13, 16]
[1, 6, 11, 16]
[4, 7, 10, 13]
```

Task3:

```python
A = [
    [1, 1, 1],
    [1, 1, 1],
    [1, 1, 1]
]

col1 = [0, 0, 0]
for i in range(len(A)):
    A[i].append(col1[i])
print(A)

col2 = [5, 5, 5]
for i in range(len(A)):
    A[i].insert(1, col2[i])
print(A)

A.append([1, 2, 3, 4, 5])
print(A)

A.insert(2, [6, 7, 8, 9, 10])
print(A)

col3 = [10, 20, 30, 40, 50]
for i in range(len(A)):
    A[i].append(col3[i])
print(A)
```

<u>Output:</u>

```
 PS D:\Internship\Day4> python task3.py
 [[1, 1, 1, 0], [1, 1, 1, 0], [1, 1, 1, 0]]
 [[1, 5, 1, 1, 0], [1, 5, 1, 1, 0], [1, 5, 1, 1, 0]]
 [[1, 5, 1, 1, 0], [1, 5, 1, 1, 0], [1, 5, 1, 1, 0], [1, 2, 3, 4, 5]]
 [[1, 5, 1, 1, 0], [1, 5, 1, 1, 0], [6, 7, 8, 9, 10], [1, 5, 1, 1, 0], [1, 2, 3, 4, 5]]
 [[1, 5, 1, 1, 0, 10], [1, 5, 1, 1, 0, 20], [6, 7, 8, 9, 10, 30], [1, 5, 1, 1, 0, 40], [1, 2, 3, 4, 5, 50]]
```

Task4:

```python
m=[
[1,2,3, 4,5],
[6,7, 8, 9,10],
[11,12,13,14,15],
[16,17,18,19,20],
[21,22,23,24,25]
]

print(m[0], m[2], m[4])
print([row[::2] for row in m])
print(m[1][:3], m[3][:3])
print([m[i][i] for i in range(len(m))])
print([m[i][4-i] for i in range(len(m))])
print(m[0][::2], m[2][::2], m[4][::2])
print([m[i][4] for i in range(1, 4)])
print(m[1][2:4], m[3][2:4])
print(m[-1])
print(m[0][1:4:2], m[1][1:4:2], m[2][1:4:2])
```

Output:

```
PS D:\Internship\Day4> python task4.py
 [1, 2, 3, 4, 5] [11, 12, 13, 14, 15] [21, 22, 23, 24, 25]
 [[1, 3, 5], [6, 8, 10], [11, 13, 15], [16, 18, 20], [21, 23, 25]]
 [6, 7, 8] [16, 17, 18]
 [1, 7, 13, 19, 25]
 [5, 9, 13, 17, 21]
 [1, 3, 5] [11, 13, 15] [21, 23, 25]
 [10, 15, 20]
 [8, 9] [18, 19]
 [21, 22, 23, 24, 25]
 [2, 4] [7, 9] [12, 14]
```

Task5:

```python
m = [
    [10, 20, 30],
    [40, 50, 60],
    [70, 80, 90]
]

# Replace 60 with 6
m[1][2] = 6
print(m)

# [10, 20, 30] [40, 50, 6]
print(m[0], m[1])

# [50, 6] [80, 90]
print(m[1][1:], m[2][1:])

# [10, 50, 90]
print([m[i][i] for i in range(len(m))])

# [30, 50, 70]
print([m[i][2-i] for i in range(len(m))])

# [20, 50, 80]
print([row[1] for row in m])

# [40, 60]
print([m[1][0], m[1][2]])

# [10, 70]
print([m[0][0], m[2][0]])

# [20, 30] [80, 90]
print(m[0][1:], m[2][1:])
```

```python
# [40, 60] [70, 90]
print([m[1][0], m[1][2]], [m[2][0], m[2][2]])
```

Output:

```
PS D:\Internship\Day4> python task5.py
 [[10, 20, 30], [40, 50, 6], [70, 80, 90]]
 [10, 20, 30] [40, 50, 6]
 [50, 6] [80, 90]
 [10, 50, 90]
 [30, 50, 70]
 [20, 50, 80]
 [40, 6]
 [10, 70]
 [20, 30] [80, 90]
 [40, 6] [70, 90]
```

Task6:

```python
A = [
    [11, 0, 4, 6, 5],
    [1, 9, 3, 2, 1],
    [7, 0, 4, 9, 8],
    [3, 7, 12, 15, 0]
]


# 1) 12
print(A[3][2])


# 2) [9,3,2] [0,4,9]
print(A[1][1:4], A[2][1:4])


# 3) [9,0]
print([A[1][1], A[2][1]])


# 4) [1,9,3] [7,0,4] [3,7,12]
print(A[1][:3], A[2][:3], A[3][:3])


# 5) [11,4,5] [3,12,0]
```

```
print([A[0][0], A[0][2], A[0][4]], [A[3][0], A[3][2], A[3][4]])


# 6) Add [0,0,0,0,0] after [3,7,12,15,0]

A.insert(4, [0, 0, 0, 0, 0])

print(A)


# 7) [11,9,4,15,0]

print([A[i][i] for i in range(len(A)-1)])


# 8) [5,2,4,7,0]

print([A[i][4] for i in range(len(A)-1)])


# 9) [1,9,3,2,1] [7,0,4,9,8]

print(A[1], A[2])


# 10) [4,6] [3,2] [4,9] [12,15]

print(A[0][2:4], A[1][2:4], A[2][2:4], A[3][2:4])
```

Output:

```
PS D:\Internship\Day4> python task6.py
12
[9, 3, 2] [0, 4, 9]
[9, 0]
[1, 9, 3] [7, 0, 4] [3, 7, 12]
[11, 4, 5] [3, 12, 0]
[[11, 0, 4, 6, 5], [1, 9, 3, 2, 1], [7, 0, 4, 9, 8], [3, 7, 12, 15, 0], [0, 0, 0, 0, 0]]
[11, 9, 4, 15]
[5, 1, 8, 0]
[1, 9, 3, 2, 1] [7, 0, 4, 9, 8]
[4, 6] [3, 2] [4, 9] [12, 15]
```

Task7:

```
B = [

   [9, 8, 7],

   [1, 3, 2],

   [4, 6, 5]

]
```

```python
# 1) [8,7] [3,2]
print(B[0][1:], B[1][1:])


# 2) [4,6]
print(B[2][:2])


# 3) [9,3,5]
print([B[i][i] for i in range(len(B))])


# 4) [7,3,4]
print([B[i][2-i] for i in range(len(B))])


# 5) Add column [1, 1, 1] after column [7,2,5]
for i in range(len(B)):
    B[i].insert(3, 1)
print(B)


# 6) [8,1] [3,1] [6,1]
print([[B[i][1], B[i][3]] for i in range(len(B))])


# 7) [1,1]
print([B[1][0], B[1][3]])


# 8) Add row [0,0,0,0] after [1,3,2,1]
B.insert(2, [0, 0, 0, 0])
print(B)


# 9) Add column [10, 10, 10, 10] after [8,3,6,0]
for i in range(len(B)):
    B[i].insert(2, 10)
print(B)


# 10) [8,7] [6,5]
print([B[0][1], B[0][3]], [B[3][1], B[3][3]])
```

Output:

```
PS D:\Internship\Day4> python task7.py
[8, 7] [3, 2]
[4, 6]
[9, 3, 5]
[7, 3, 4]
[[9, 8, 7, 1], [1, 3, 2, 1], [4, 6, 5, 1]]
[[8, 1], [3, 1], [6, 1]]
[1, 1]
[[9, 8, 7, 1], [1, 3, 2, 1], [0, 0, 0, 0], [4, 6, 5, 1]]
[[9, 8, 10, 7, 1], [1, 3, 10, 2, 1], [0, 0, 10, 0, 0], [4, 6, 10, 5, 1]]
[8, 7] [6, 5]
```