```python
# Latihan 1

# No. 1
import numpy as np
matriks_nol = np.zeros((28, 5))
print("Matriks nol berukuran m x n:\n", matriks_nol)
```

```
Matriks nol berukuran m x n:
 [[0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]]
```

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```
[ ]  1 # Latihan 1
     2
     3 # No. 2
     4 import numpy as np
     5 matriks_identitas = np.eye(4)
     6 print("Matriks identitas berukuran k x k:\n", matriks_identitas)
```

```
Matriks identitas berukuran k x k:
 [[1. 0. 0. 0.]
 [0. 1. 0. 0.]
 [0. 0. 1. 0.]
 [0. 0. 0. 1.]]
```

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```
[ ]  1 # Latihan 1
     2
     3 # No. 3
     4 import numpy as np
     5 x  = np.array([100, 100, 100])
     6 matriks_diagonal = np.diag(x)
     7 print("Matriks diagonal berukuran 3 x 3:\n", matriks_diagonal)
```

```
Matriks diagonal berukuran 3 x 3:
 [[100   0   0]
 [  0 100   0]
 [  0   0 100]]
```

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```
[ ]  1 # Latihan 1
     2
     3 # No. 4
     4 import numpy as np
     5
     6 #t = int(input("Target berapa banyak mantan Anda sebelum nanti menikah: "))
     7 #x = 2*t+1
     8
     9 c = np.arange(1, 140, 2)
    10 print(c)
    11
    12 C = c.reshape((7, 10))
    13 print("Matriks:\n", C)
```

```
[  1   3   5   7   9  11  13  15  17  19  21  23  25  27  29  31  33  35
  37  39  41  43  45  47  49  51  53  55  57  59  61  63  65  67  69  71
  73  75  77  79  81  83  85  87  89  91  93  95  97  99 101 103 105 107
 109 111 113 115 117 119 121 123 125 127 129 131 133 135 137 139]
Matriks:
 [[  1   3   5   7   9  11  13  15  17  19]
 [ 21  23  25  27  29  31  33  35  37  39]
 [ 41  43  45  47  49  51  53  55  57  59]
 [ 61  63  65  67  69  71  73  75  77  79]
 [ 81  83  85  87  89  91  93  95  97  99]
 [101 103 105 107 109 111 113 115 117 119]
 [121 123 125 127 129 131 133 135 137 139]]
```

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```
[ ]  1 # Latihan 2
     2
     3 # No. 1
     4 import numpy as np
     5
     6 A = np.array([[1,5,2,9], [2,7,-1,0]])
     7 B = np.array([[0,8], [-3,4], [1,1], [7,-2]])
     8
     9 x = 20*A # 20A
    10 y = 7*B.T # 7B^T
    11
    12 print("20A - 7B^T:\n", x-y)
    13
    14
```

```
20A - 7B^T:
 [[ 20 121  33 131]
 [-16 112 -27  14]]
```

```
[ ]  1 # Latihan 2
     2
     3 # No. 2
     4 import numpy as np
     5
     6 A = np.array([[1,5,2,9], [2,7,-1,0]])
     7 B = np.array([[0,8], [-3,4], [1,1], [7,-2]])
     8
     9 x = A@A.T # AA^T
    10 y = A@B # AB
    11 z = B.T@B # (B^T)B
    12
    13 print("AA^T - AB + (B^T)B:\n ", x - y - z)
```

```
AA^T - AB + (B^T)B:
  [[  2  48]
 [ 82 -74]]
```

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```
[ ]  1 # Latihan 2
     2
     3 # No. 3
     4 import numpy as np
     5
     6 A = np.array([[1,5,2,9], [2,7,-1,0]])
     7 B = np.array([[0,8], [-3,4], [1,1], [7,-2]])
     8
     9 x = (B@B.T)@(B@B.T)@(B@B.T)@(B@B.T)@(B@B.T) # (BB^T)^5
    10 y = (10*B)@((A@A.T)@(A@A.T)@(A@A.T)@(A@A.T)@(A@A.T))@B.T # 10B(AA^T)^5(B^T)
    11 z = np.eye(4) # I
    12
    13 print("(BB^T)^5 - 10B(AA^T)^5(B^T) + I:\n ", x - y + z)
    14
    15
    16
```

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```
(BB^T)^5 - 10B(AA^T)^5(B^T) + I:
  [[-4.02844541e+12  1.13207195e+12 -1.55232056e+12 -6.33424283e+12]
 [ 1.13207195e+12 -3.48575929e+11  4.46379628e+11  1.85107645e+12]
 [-1.55232056e+12  4.46379628e+11 -6.01553372e+11 -2.46451298e+12]
 [-6.33424283e+12  1.85107645e+12 -2.46451298e+12 -1.01255677e+13]]
```

```
1 # Latihan 2
2
```

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```
[ ]  1 # Latihan 2
     2
     3 # No. 4
     4 import numpy as np
     5
     6 c_arange = np.arange(1, 100, 2)
     7 c_diag = np.diag(c_arange)
     8 c_I = np.ones((50, 50))
     9 C = c_diag@c_I
    10
    11 d_arange = np.arange(100, 1, -2)
    12 d_diag = np.diag(d_arange)
    13 d_I = np.ones((50, 50))
    14 D = d_I@d_diag
    15
    16 print("CD:\n", C@D)
```

```
CD:
 [[5.000e+03 4.900e+03 4.800e+03 ... 3.000e+02 2.000e+02 1.000e+02]
 [1.500e+04 1.470e+04 1.440e+04 ... 9.000e+02 6.000e+02 3.000e+02]
 [2.500e+04 2.450e+04 2.400e+04 ... 1.500e+03 1.000e+03 5.000e+02]
 ...
 [4.750e+05 4.655e+05 4.560e+05 ... 2.850e+04 1.900e+04 9.500e+03]
 [4.850e+05 4.753e+05 4.656e+05 ... 2.910e+04 1.940e+04 9.700e+03]
 [4.950e+05 4.851e+05 4.752e+05 ... 2.970e+04 1.980e+04 9.900e+03]]
```

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```
1 # Latihan 2
2
3 # No. 5
4 import numpy as np
5
6 c_arange = np.arange(1, 100, 2)
7 c_diag = np.diag(c_arange)
8 c_I = np.ones((50, 50))
9 C = c_diag@c_I
10
11 d_arange = np.arange(100, 1, -2)
12 d_diag = np.diag(d_arange)
13 d_I = np.ones((50, 50))
14 D = d_I@d_diag
15
16 x = (C@C@C)/100 # C^3/100
17 y = (D@D)/25 # D^2/25
18
19 print("C^3/100 + D^2/25:\n ", x + y)
```

```
C^3/100 + D^2/25:
  [[  72700.   72496.   72292. ...   63112.   62908.   62704.]
 [ 197700.  197496.  197292. ...  188112.  187908.  187704.]
 [ 322700.  322496.  322292. ...  313112.  312908.  312704.]
 ...
 [5947700. 5947496. 5947292. ... 5938112. 5937908. 5937704.]
 [6072700. 6072496. 6072292. ... 6063112. 6062908. 6062704.]
 [6197700. 6197496. 6197292. ... 6188112. 6187908. 6187704.]]
```

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```
[ ]  1 # Soal Tantangan
```

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```python
# Soal Tantangan

k = int(input("Input k: "))
m = int(input("Input m: "))
n = int(input("Input n: "))


def createMatrix(k, x, dataList):
    mat = []
    for i in range(k):
        rowList = []
        for j in range(x):
            rowList.append(dataList[k * i + j])
        mat.append(rowList)


    return mat

alpha = ['a','b','c','d','e','f','h','i','j','k','l','m','n','o','p','q','r','s','t','u','v','w','x','y','z']
A = createMatrix(k,m,alpha)
B = createMatrix(k,n,alpha)

rows = len(A)
column = len(B[0])

AB = createMatrix(rows, column, alpha)

print("Matrix AB:\n")
for line in AB:
    print(*line)

```

```
Input k: 5
Input m: 4
Input n: 3
Matrix AB:

a b c
f h i
l m n
q r s
v w x
```

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