1-Savol. Quyidagi berilgan havola orqali https://teachablemachine.withgoogle.com/

o‘zingizni birinchi oddiy sun’iy intellek modelingizni yarating.

https://teachablemachine.withgoogle.com/models/eMXEF63kt/

https://colab.research.google.com/drive/1LjzNgY6B_hP2_mdC63wkCyMypz3mAP64?usp=sharing

2-Savol Numpy kutubxonasi orqali massiv yarating va massiv turlari haqida ma’lumot

yozing . Array, arrange, ndim, shape, size, zeros, ones, dtype, astype, random, metodlari haqida ma’lumot yozing va har bir metodni ishlatish bo‘yicha misollar ishlab natija oling.

Array: NumPy-da bir xil turdagi ma'lumotlar elementlarini saqlaydigan asosiy ma'lumotlar tuzilmasi. arange(start, stop, step): teng intervalli qiymatlarni o'z ichiga olgan massiv yaratadi. ndim: massivdagi o'lchamlar (o'qlar) sonini qaytaradi. shape: Massiv o'lchamlarini ifodalovchi kortejni qaytaradi (masalan, 3x4 matritsa uchun (3, 4)). size: massivdagi elementlarning umumiy sonini qaytaradi. zeros(shape, dtype=float): Nollar bilan to?ldirilgan massiv hosil qiladi. ones(shape, dtype=float): Birlar bilan to'ldirilgan massivni yaratadi. dtype: massivdagi elementlarning ma'lumotlar turini qaytaradi. astype(dtype): Massivdagi elementlarning ma'lumotlar turini o'zgartiradi. random.randint(past, baland, o'lcham):low (shu jumladan) dan high(eksklyuziv) gacha bo'lgan tasodifiy butun sonlar massivini yaratadi .

```
import numpy as np
```

Array:Numpy kutubxonasida massiv yaratish uchun eng kop ishlatiladigan metod.Misol uchun:

```
royxatt=[[6,3,1,1],[8,7,4,1]]
m_m=np.array(royxatt)
m_m
```

```
array([[6, 3, 1, 1],
       [8, 7, 4, 1]])
```

```
m1=np.arange(2,111,11)
m1 # bunda 1 dan boshlab 100 gacha 10 ga farq qiladigan sonlarni massiv elementiga o'zlas
```

```
array([  2,  13,  24,  35,  46,  57,  68,  79,  90, 101])
```

```
np.ndim(m_m) # ndim metodi massiv o'lchamini aniqlaydi
```

```
2
```

```
np.ndim(m1)
```

```
1
```

```
np.shape(m_m) #Shape:Massivning satrlar va ustunlar sonini aniqlaydi
```

```
(2, 4)
```

```
np.size(m_m) #Size:massivdagi elementlar sonini aniqlaydi
```

```
8
```

```
m2=np.zeros(shape=(2,2))
m2
```

```
array([[0., 0.],
       [0., 0.]])
```

```
m3=np.ones(shape=(5,5))
m3
```

```
array([[1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1.]])
```

3-Savol Numpy kutubxonasi orqali 2 oʻlchovli va 3 oʻlchovli massiv yarating, size,

zeros, ones, dtype, astype metodlari bo’yicha misollar tayyorlang va ishlatib ko’rsating

```
ruyxat=[[8,9,6,7],[41,85,63,87]]
massiv2=np.array(ruyxat)
massiv2 # 2 o'lchovli massiv yaratish
```

```
array([[ 8,  9,  6,  7],
       [41, 85, 63, 87]])
```

```
massiv2.size #size metodi massiv elementlar sonini chiqarib beradi
```

```
8
```

```
ruyxat2=[[[7,8,5,9],[10,12,14,16]], [[741,852,963,102],[321,654,987,102]]]
massiv3=np.array(ruyxat2)
massiv3 # 3 o'lchamli massiv yaratish
```

```
array([[[  7,   8,   5,   9],
        [ 10,  12,  14,  16]],

       [[741, 852, 963, 102],
        [321, 654, 987, 102]]])
```

```
massiv3.size #size metodi massiv elementlar sonini chiqarib beradi
```

```
16
```

```
massiv=np.zeros(shape=(4,6))
massiv # barcha elementlari 0 dan iborat bo'lgan massiv yaratib beradi
```

```
array([[0., 0., 0., 0., 0., 0.],
       [0., 0., 0., 0., 0., 0.],
       [0., 0., 0., 0., 0., 0.],
       [0., 0., 0., 0., 0., 0.]])
```

```
massiv1=np.arange(6).reshape(2,3)
massiv1
```

```
array([[0, 1, 2],
       [3, 4, 5]])
```

```
massiv2=np.arange(12).reshape(3,4)
massiv2
```

```
array([[ 0,  1,  2,  3],
       [ 4,  5,  6,  7],
       [ 8,  9, 10, 11]])
```

```
massiv1.size #3.1
```

```
6
```

```
massiv2.size #3.1

     12
```

```
massiv3=np.zeros(shape=(5,6))
massiv3

     array([[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.]])
```

```
massiv4=np.ones(shape=(3,4)) # 3.3
massiv4

     array([[1., 1., 1., 1.],
            [1., 1., 1., 1.],
            [1., 1., 1., 1.]])
```

```
massiv4.dtype # 3.4

     dtype('float64')
```

```
massiv1.dtype # 3.4

     dtype('int64')
```

```
massiv3.astype # 3.5

     <function ndarray.astype>
```

```
massiv1. astype # 3.5

     <function ndarray.astype>
```

4-Savol Numpy kutubxonasi arange va random.randint metodi orqali elementlari 1 dan 200 gacha boʻlgan massiv yarating. Massiv elementlari orasidan 35 dan 105 gacha boʻlgan elementlarni 9 raqami bilan almashtiring va massivni 25 dan 50 gacha boʻlgan elementlari yigʻindisi toping.

```
massiv0=np.arange(1,201,1)
massiv0

     array([  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,  26,
             27,  28,  29,  30,  31,  32,  33,  34,  35,  36,  37,  38,  39,
             40,  41,  42,  43,  44,  45,  46,  47,  48,  49,  50,  51,  52,
             53,  54,  55,  56,  57,  58,  59,  60,  61,  62,  63,  64,  65,
        66,  67,  68,  69,  70,  71,  72,  73,  74,  75,  76,  77,  78,
        79,  80,  81,  82,  83,  84,  85,  86,  87,  88,  89,  90,  91,
        92,  93,  94,  95,  96,  97,  98,  99, 100, 101, 102, 103, 104,
       105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117,
       118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130,
       131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143,
       144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156,
       157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169,
       170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182,
       183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195,
       196, 197, 198, 199, 200])
```

```
massiv01=np.random.randint(1,201,size=200)
massiv01
```

```
array([ 79, 145,  22, 174, 173,  76,  88, 100, 182, 117, 106, 193, 105,
       126,  57,  67, 194,  11,  83, 139,  20,  86, 122,  33,  54, 124,
        54,  58,  48, 155,  21,  82,  91, 132,  17, 155, 143, 162,  11,
       147,  17, 128,  72,  51, 119, 166,  42,  18, 165, 108,  61, 174,
        56, 160,  59,  80, 126, 113, 158,  38, 104, 164,  98,   5, 151,
       164,  65,  48,  48,  15, 139, 178,   6, 167, 178, 110,  46,  74,
        71, 155,  55, 198,  24,  34, 119, 161, 128,  76,  16,  53, 109,
        66, 146, 177, 122, 154,  69,  66,   3,   1,  42, 179, 133,  21,
        22, 108, 193,  77,  91,   8, 171, 184, 150, 175, 140,  51,  74,
         8, 132, 101, 161, 197, 140,  27,  54, 116,  73,  96, 117,  89,
       137, 176,  92, 165,  27,   6,  38,  46, 135,  14, 173,  47,  61,
       107, 165, 151,  85,  14,  92,  29, 156,  62,  45,  89,  40, 160,
       129,  89, 123, 146, 182,  13,  40, 114, 144, 153, 196, 184, 102,
       167, 112,  81,  78,  39, 105, 160, 198, 137, 106, 156,  59, 182,
       154,  77, 122, 161, 109, 145, 194, 169, 150,  38,  91,  19,  41,
        96,  17,  13,  58, 188])
```

```
massiv0[35:105]=9
massiv0
```

```
array([  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,  26,
        27,  28,  29,  30,  31,  32,  33,  34,  35,   9,   9,   9,   9,
         9,   9,   9,   9,   9,   9,   9,   9,   9,   9,   9,   9,   9,
         9,   9,   9,   9,   9,   9,   9,   9,   9,   9,   9,   9,   9,
         9,   9,   9,   9,   9,   9,   9,   9,   9,   9,   9,   9,   9,
         9,   9,   9,   9,   9,   9,   9,   9,   9,   9,   9,   9,   9,
         9,   9,   9,   9,   9,   9,   9,   9,   9,   9,   9,   9,   9,
         9, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117,
       118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130,
       131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143,
       144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156,
       157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169,
       170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182,
       183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195,
       196, 197, 198, 199, 200])
```

```
massiv01[35:105]=9
massiv01
```

```
array([ 79, 145,  22, 174, 173,  76,  88, 100, 182, 117, 106, 193, 105,
       126,  57,  67, 194,  11,  83, 139,  20,  86, 122,  33,  54, 124,
        54,  58,  48, 155,  21,  82,  91, 132,  17,   9,   9,   9,   9,
         9,   9,   9,   9,   9,   9,   9,   9,   9,   9,   9,   9,   9,
         9,   9,   9,   9,   9,   9,   9,   9,   9,   9,   9,   9,   9,
         9,   9,   9,   9,   9,   9,   9,   9,   9,   9,   9,   9,   9,
         9,   9,   9,   9,   9,   9,   9,   9,   9,   9,   9,   9,   9,
         9,   9,   9,   9,   9,   9,   9,   9,   9,   9,   9,   9,   9,
         9, 108, 193,  77,  91,   8, 171, 184, 150, 175, 140,  51,  74,
         8, 132, 101, 161, 197, 140,  27,  54, 116,  73,  96, 117,  89,
       137, 176,  92, 165,  27,   6,  38,  46, 135,  14, 173,  47,  61,
       107, 165, 151,  85,  14,  92,  29, 156,  62,  45,  89,  40, 160,
       129,  89, 123, 146, 182,  13,  40, 114, 144, 153, 196, 184, 102,
       167, 112,  81,  78,  39, 105, 160, 198, 137, 106, 156,  59, 182,
       154,  77, 122, 161, 109, 145, 194, 169, 150,  38,  91,  19,  41,
        96,  17,  13,  58, 188])
```

```
np.sum(massiv01[25:50])
```

```
917
```

```
np.sum(massiv0[25:50])
```

```
440
```

5-Savol . Numpy kutubxonasi orqali massiv yarating, yaratgan massivingizni transporterlang, yaratgan massivingizda quyidagi funksiyalarni ishlating: sqrt,square,exp,log, modf,sign, isnan

```
import numpy as np
massiv11=np.arange(6).reshape(2,3) #5.1. Numpy kutubxonasi orqali massiv yarat
massiv11
```

```
array([[0, 1, 2],
       [3, 4, 5]])
```

```
bb=np.random.randint(10, size=(3,4))
```

```
array([[2, 9, 0, 0],
       [5, 8, 2, 1],
       [2, 6, 1, 8]])
```

```
bb.T # Massivlarni transporterlash
```

```
array([[2, 5, 2],
       [9, 8, 6],
       [0, 2, 1],
       [0, 1, 8]])
```

```
massiv11.T  #5.2. yaratgan mas
```

```
array([[0, 3],
       [1, 4],
       [2, 5]])
```

```
np.sqrt(massiv11)  #massiv elementlarini kvadrat ildiz chiqaradi

     array([[0.        , 1.        , 1.41421356],
            [1.73205081, 2.        , 2.23606798]])
```

```
np.square(massiv1)  # massiv elementlarini kvadratga ko'taradi

     array([[ 0,  1,  4],
            [ 9, 16, 25]])
```

```
np.exp(massiv11)   #massiv ning barcha elementlarini exsponentasini aniqlash

     array([[  1.        ,   2.71828183,   7.3890561 ],
            [ 20.08553692,  54.59815003, 148.4131591 ]])
```

```
np.exp(massiv11)

     array([[  1.        ,   2.71828183,   7.3890561 ],
            [ 20.08553692,  54.59815003, 148.4131591 ]])
```

```
np.log(massiv11[1:]) #massiv ning barcha elementlarini logarifmini aniqlash (loge)

     array([[1.09861229, 1.38629436, 1.60943791]])
```

```
qoldiq,butun=np.modf(massiv11)
```

```
qoldiq

     array([[0., 0., 0.],
            [0., 0., 0.]])
```

```
(butun)

     array([[0., 1., 2.],
            [3., 4., 5.]])
```

```
np.sign(massiv11)

     array([[0, 1, 1],
            [1, 1, 1]])
```

```
np.isnan(massiv1)

     array([[False, False, False],
            [False, False, False]])
```