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| **2-Mustaqil ish uchun savollar 72-23 SI guruh talabasi Mirzayev Muhammadkarim** | | | |
| **Ushbu mustaqil ishda har bir metod yoki funksiya uchun tariflar va code lar yozib tushintirinsh bering** | | | |
|  | **Bo‘limlar** | **Numpy funksiya va metodlari  *(Jadval o’lchamlarini istagancha o’zgartirishingiz mumkin)*** | |
| 1 | Basics: | **numpy.array()** | **Matritsa yaratib beradi**  **np.array(4,4)** |
| 2 | **numpy.arange()** | **Berilgan n dan m gacha sonlarni p qadam bilan chiqaradi**  **np.arange(start, stop, step)**  **np.arange(1,35,5)** |
| 3 | **numpy.linspace()** | **n dan m gacha k ta sonlarni bir xil oraliqda chiqaradi**  **Np.linspace(10,100,5)** |
| 4 | **numpy.zeros()** | **0 dan tashkil topgan birga matritsa tuzadi**  **np.zeros(4)** |
| 5 | **numpy.ones()** | **1 dan tashkil topgan bir o’lchovli n ta elementli matritsa yaratadi**  **np.ones(n)** |
| 6 | **numpy.empty()** | **0 ga yaqin sonlardan tashkil topgan matrirsa yaratadi**  **np.empty((3,4))** |
| 7 | **numpy.array()** | **Matritsa yaratib beradi**  **np.array(4,4)** |
| 8 | **numpy.eye():** | **Dioganali birlardan tashkil topgan matritsa yaratadi**  **Np.eye(5)** |
| 9 |  |  |
| 10 | **numpy.full()** | **Berilgan qiymatdan matritsa yaratadi**  **Np.full((3,5),4)** |
| 11 | Array Attributes: | **ndarray.shape** | **Yaratilgan matritsa olchamini chiqaradi**  **arr.shape** |
| 12 | **ndarray.ndim** | **massivning nechchi o’lchamli ekanini ko’rsatadi.**  **arr=np.array( [[2,5,7], [4,6,9]] )**  **arr.ndim** |
| 13 | **ndarray.size** | **massivdagi elementlar sonini ko’rsatad**  **arr=np.array( [[2,5,7], [4,6,9]] )**  **arr.size** |
| 14 | **ndarray.dtype** | **massivdagi elementlar turini ko’rsatadi.**  **arr=np.array( [[2,5,7], [4,6,9]] )**  **arr.dtype** |
| 15 | **ndarray.itemsize:** | **har bir elementning xotiradan oladigan baytlar miqdorini ko’rsatadi.**  **Arr.itemsize** |
| 16 | **ndarray.nbytes:** | **massivning umumiy xotirasini baytlar sifatida ko’rsatadi** |
| 17 | **ndarray.data** | **massivning malumotni saqlashga ishlatiladigan xotirasini dastlabki ko’rinishda baytlar obyektini ko’rsatadi**  **data1=arr.data**  **data1** |
| 18 | **Array Operations:** | **arr1 + arr2,**  **arr1 - arr2,**  **arr1 \* arr2,**  **arr1 / arr2,**  **arr1 \*\* arr2, etc.** | **Arr1 massivga arr2 massivning har bir elementini**  **Qoshadi**  **Ayridi**  **Kopaytiradi**  **Boladi**  **Darajaga kotaradi** |
| 19 | **arr1 + 5,**  **arr1 \* 2, etc.** | **1)arr1 matritsa har bir elementiga besh qoshadi**  **2) arr1 matritsa har bir elementini 2ga kopaytiradi** |
| 20 | **arr[0],**  **arr[1:3],**  **arr[:, 1],**  **arr.loc[]**  **arr.iloc[]…** | **massivning**   1. **0- indeksiga murojat qiladi** 2. **1- indeksdan 3- indeksgacha oladi** 3. **ustunlarning 1-satrni oladi** 4. **Pandasga tegishli ekan** |
| 21 | **arr.sum(),**  **arr.mean(),**  **arr.min(),**  **arr.max(),**  **arr.std(),**  **arr.var()…** | **1)massivning barcha elementlarini qo’shadi**  **arr = np.array([1, 2, 3])**  **arr.sum() ,arr.sum(axis=0) ,arr.sum(axis=1)**    **2) elementlarning o'rtacha qiymatini hisoblaydi**  **arr.mean() , arr.mean(axis=0), arr.mean(axis=1)**  **3)elementlar minimum qiymatni topadi**  **arr.min()**  **4)barcha elementlar maxsimum qiymatni topadi**  **arr.max()**  **barcha elementlarning standart og'ishini hisoblaydi**  **sarr.std()**  **barcha elementlarning dispersiyasini hisoblaydi**  **arr.var()** |
| 22 | **arr1 == arr2,**  **arr1 < arr2 …** | **Arr1 massivning arr2 massivdagi mos elementlarini tengligini tekshiradi**  **Arr1 massivning arr2 massivdagi mos elementlarini kattaligini tekshiradi** |
| 23 | **np.concatenate(),**  **np.vstack(),**  **np.hstack(),**  **np.dstack()** | **Bu funksiya massivlarni birlashtirish uchun ishlatiladi**  **Tagma tag holatda massivlarni birlashtiradi.**  **Massivlarni yonma yon birlashtiradi.**  **Massivlarni o’lchamlari bo’yicham birlashtiradi.mos indeksdagi sonlarni birlashtiradi** |
| 24 | **np.split(),**  **np.vsplit(),**  **np.hsplit(),**  **np.dsplit(), …** | **massivni bo’lish uchun ishlatiladi**  **arr=(2,5,7,8,9,8) np.split(arr,2)**  **Massivni vertikal holatda bo’ladi.**  **np.vsplit(arr,2)**  **Massivni gorizantal bo’ladi.**  **np.hsplit**  **Massivni kenglik,balandlik va uzunlik bo’yicha bo’ladi**  **np.dsplit** |
| 25 | **Random Number Generation:** | **numpy.random.rand()** | **o va1 orasidagi tasodifiy sonlardan iborat massiv yaratadi**  **Arr = np. random.rand()** |
| 26 | **numpy. random.randn** | **Standart normal distributsiyasiga mos qiymatlarga ega tasodifiy sonlar massivini yaratadi.**  **Arr = np. random.randn()** |
| 27 | **numpy.random.randint()** | **Berilgan sonlar oralig’idan tasodifiy butun sonlarni chiqaradi**  **Arr = np. random.randint()** |
| 28 | **numpy.random.random():** | **o va1 orasidagi tasodifiy sonlardan iborat massiv yaratadi**  **Arr = np. random.rand()** |
| 29 | **numpy.random.choice():** | **Berilgan qiymatlardan tasodifiy tanlash uchun ishlatiladi**  **Arr = np. random.choise(10,5)** |
| 30 | **numpy.random.shuffle():** | **Berilgan massiv ichki elementlarini tasodifiy tartibda qayta joylash**  **Np.random.shuffle(arr)** |
| 31 | **numpy.random.permutation():** | **Berilgan massiv elementlarini tasodifiy tartibda qayta joylash**  **np.random.permutation(arr)** |
| 32 | **numpy.random.seed():** | **Tasodifiy sonlarni yaratish uchun ishlatiladigan boshlang’ich random malumotlarini o’rnatadi. Np.random.seed()** |
| 33 | **numpy.random.normal():** | **Standart normal distributsiyaga mos keladigan tasodifiy sonlar yaratish uchun ishlatiladi**  **np.random.normal(size=(3,4))** |
| 34 | **numpy.random.uniform():** | **Berilgan m va n sonlar oralig’idagi tasodifiy sonlarni yaratish uchun ishlatiladi**  **np.random.uniform(size=(2,4))** |
| 35 | **numpy.random.normal(loc, scale, size)** | **loc=distributsiyaning o’rta qiymatini**  **scale= distributsiyaning farqini**  **size= yaratilayotgan tasodifiy sonlar sonini yoki massiv o’lchamini belgilaydi**  **np.random.normal(size=(3,4),loc=0,scale=1)** |
| 36 | **Array Manipulation:** | **ndarray.reshape()** | **Massivning o’lchamini o’zgartirish uchun ishlatiladi.berilgan o’lcham elementlar soniga mos bo’lishi kerak**  **arr = np.arange(1,31).reshape(5,6)** |
| 37 | **ndarray.flatten()** | **Massivni birlashtirilgan bir o’lchovli massivga aylantiradi**  **arr.flatten** |
| 38 | **ndarray.transpose()** | **Massivni satirlarini ustunlariga aylantirishda ishlatiladi** |
| 39 | **ndarray.swapaxes():** | **Massivda o’lchamlar orasidagi almashtirishni amalga oshiradi**  **arr.swapaxes()** |
| 40 | **ndarray.squeeze():** | **Massivda 1 ta elementli o’lchamlarni olib tashlash uchun ishlatiladi.** |
| 41 | **np.tile():** | **Berilgan massivni ko’p marta takrorlash uchun ishlatiladi.**  **np.tile(arr,3)** |
| 42 | **np.append():** | **Massiv oxiridan yangi element qo’shish uchun ishlatiladi**  **np.append(arr,[3,5,6])** |
| 43 | **np.insert():** | **Massivga index bo’yicha element qo’shish uchun ishlatiladi.**  **Np.insert(arr,2,[6,7])** |
| 44 | **np.delete():** | **Massivdan berilgan index bo’yicha elementni olib tashlash ishlatilad**  **Np.delete(arr,3)** |
| 45 | **Mathematical Functions:** | **numpy.exp():.** | **Massivning barcha elementlari eksponenta kopaytmasini hisoblash uchun ishlatiladi.eksponenta(e)=2.71828**  **Np.exp(arr)** |
| 46 | **numpy.log()** | **Massiv elementlariningining natural logarifmini hisoblash uchun ishlatiladi.**  **Np.log(arr)** |
| 47 | **numpy.sqrt():** | **Massiv elementlariningining ildizini hisoblash uchun ishlatiladi.**  **Np.sqrt(arr)** |
| 48 | **numpy.sin(),**  **numpy.cos(),**  **numpy.tan():** | **Massivning har bir elementining arr=np.array(0, np. pi/2 ,np.pi)**  **Sinusini np.sin(arr)**  **Cosinusini np.cos(arr)**  **Tangensin np.tan(arr)**  **hisoblash uchun ishlatiladi** |
| 49 | **numpy.arcsin(), numpy.arccos(), numpy.arctan():** | **Massivning har bir elementining arr=np.array(0, 0.5 , 1)**  **arcsinusini np.arcsin(arr)**  **arccosinusini np. arccos(arr)**  **arctangensini np. arctan(arr)**  **hisoblash uchun ishlatiladi.** |
| 50 | **numpy.deg2rad(),**  **numpy.rad2deg()** | **Darajalarni radianlarga o’tkazish uchun ishlatiladi.**  **degres=90**  **radian=np.deg2rad(degres)**  **Radianlarni darajalarga o’tkazish uchun ishlatiladi.**  **radian=np.pi**  **degres=np. rad2deg( radian)** |