

10.

```
In [6]: import numpy as np
arr1=np.full((10,10),4)
print("arr1: ",arr1)
print("arr2: ",arr2)
arr2=np.arange(1,101).reshape(10,10)
mult_res=arr1*arr2
print("Mult Result: ",mult_res)
```

arr1: [[4 4 4 4 4 4 4 4 4 4]  
[4 4 4 4 4 4 4 4 4 4]  
[4 4 4 4 4 4 4 4 4 4]  
[4 4 4 4 4 4 4 4 4 4]  
[4 4 4 4 4 4 4 4 4 4]  
[4 4 4 4 4 4 4 4 4 4]  
[4 4 4 4 4 4 4 4 4 4]  
[4 4 4 4 4 4 4 4 4 4]  
[4 4 4 4 4 4 4 4 4 4]  
[4 4 4 4 4 4 4 4 4 4]]  
arr2: [[ 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]]  
Mult Result: [[ 4 8 12 16 20 24 28 32 36 40]  
[ 44 48 52 56 60 64 68 72 76 80]  
[ 84 88 92 96 100 104 108 112 116 120]  
[124 128 132 136 140 144 148 152 156 160]  
[164 168 172 176 180 184 188 192 196 200]  
[204 208 212 216 220 224 228 232 236 240]  
[244 248 252 256 260 264 268 272 276 280]  
[284 288 292 296 300 304 308 312 316 320]  
[324 328 332 336 340 344 348 352 356 360]  
[364 368 372 376 380 384 388 392 396 400]]

11.

```
In [9]: import numpy as np
arr=np.array([list(range(10,-1,2)),list(range(0,11,2))])
print("Array: ",arr)
```

Array: [list([]) list([0, 2, 4, 6, 8, 10])]

12.

OUTPUT

[10 8 6 4 2 0 0 2 4 6 8 10]

a is

[10 10 6 4 2 0 0 2 4 6 8 10]

ans is

[10, 8, 6, 4, 2, 0] [0 2 4 6 8 10]

[10 8 6 + 2 0 0 2 4 6 8 10]

a is

[10 10 6 4 2 0 0 2 4 6 8 10]

ans is

[10 10 6 4 2 0] [0 2 4 6 8 10]

13.

```
In [16]: import pandas as pd  
df=pd.read_csv("https://raw.githubusercontent.com/cs109/2014_data/master/countries.csv")  
df
```

Out[16]:

|     | Country   | Region        |
|-----|-----------|---------------|
| 0   | Algeria   | AFRICA        |
| 1   | Angola    | AFRICA        |
| 2   | Benin     | AFRICA        |
| 3   | Botswana  | AFRICA        |
| 4   | Burkina   | AFRICA        |
| ... | ...       | ...           |
| 189 | Paraguay  | SOUTH AMERICA |
| 190 | Peru      | SOUTH AMERICA |
| 191 | Suriname  | SOUTH AMERICA |
| 192 | Uruguay   | SOUTH AMERICA |
| 193 | Venezuela | SOUTH AMERICA |

194 rows × 2 columns

14.

```
In [18]: import pandas as pd
df=pd.read_csv("titanic.csv")
df.head()

Out[18]:
   PassengerId  Survived  Pclass          Name     Sex   Age  SibSp  Parch     Ticket  Fare Cabin Embarked
0            1         0      3  Braund, Mr. Owen Harris   male  22.0      1     0    A/5 21171  7.2500   NaN       S
1            2         1      1  Cumings, Mrs. John Bradley (Florence Briggs Th... female  38.0      1     0    PC 17599  71.2833   C85       C
2            3         1      3           Heikkinen, Miss. Laina  female  26.0      0     0    STON/O2.3101282  7.9250   NaN       S
3            4         1      1        Futrelle, Mrs. Jacques Heath (Lily May Peel) female  35.0      1     0    113803  53.1000  C123       S
4            5         0      3           Allen, Mr. William Henry   male  35.0      0     0    373450  8.0500   NaN       S
```

15.

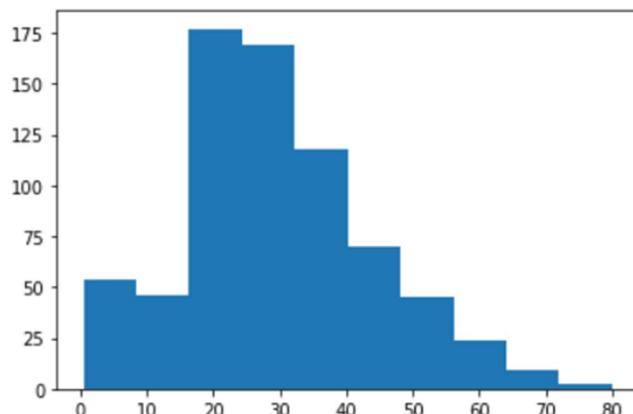
```
In [20]: import pandas as pd
df=pd.read_csv("titanic.csv")
df.describe()

Out[20]:
   PassengerId  Survived  Pclass      Age  SibSp  Parch     Fare
count    891.000000  891.000000  891.000000  714.000000  891.000000  891.000000
mean     446.000000  0.383838  2.308642  29.699118  0.523008  0.381594  32.204208
std      257.353842  0.486592  0.836071  14.526497  1.102743  0.806057  49.693429
min      1.000000  0.000000  1.000000  0.420000  0.000000  0.000000  0.000000
25%    223.500000  0.000000  2.000000  20.125000  0.000000  0.000000  7.910400
50%    446.000000  0.000000  3.000000  28.000000  0.000000  0.000000  14.454200
75%    668.500000  1.000000  3.000000  38.000000  1.000000  0.000000  31.000000
max    891.000000  1.000000  3.000000  80.000000  8.000000  6.000000  512.329200
```

16

```
In [27]: import matplotlib.pyplot as plt
import pandas as pd
df=pd.read_csv("titanic.csv")
plt.hist(df["Age"])

Out[27]: (array([ 54.,  46., 177., 169., 118.,  70.,  45.,  24.,   9.,   2.]),
array([ 0.42 ,  8.378, 16.336, 24.294, 32.252, 40.21 , 48.168, 56.126,
       64.084, 72.042, 80.   ]),
<BarContainer object of 10 artists>)
```



17(a)

```
In [33]: import pandas as pd
import matplotlib.pyplot as plt
df=pd.read_csv("iris.csv")
df.head()
```

```
Out[33]:
   sepal.length  sepal.width  petal.length  petal.width  variety
0            5.1         3.5          1.4         0.2    Setosa
1            4.9         3.0          1.4         0.2    Setosa
2            4.7         3.2          1.3         0.2    Setosa
3            4.6         3.1          1.5         0.2    Setosa
4            5.0         3.6          1.4         0.2    Setosa
```

```
In [34]: df.tail()
```

```
Out[34]:
   sepal.length  sepal.width  petal.length  petal.width  variety
145           6.7         3.0          5.2         2.3  Virginica
146           6.3         2.5          5.0         1.9  Virginica
147           6.5         3.0          5.2         2.0  Virginica
148           6.2         3.4          5.4         2.3  Virginica
149           5.9         3.0          5.1         1.8  Virginica
```

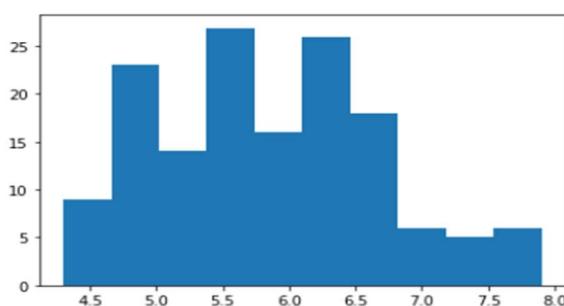
17(b)

```
In [35]: df.describe()
```

```
Out[35]:
   sepal.length  sepal.width  petal.length  petal.width
count    150.000000  150.000000  150.000000  150.000000
mean     5.843333   3.057333   3.758000   1.199333
std      0.828066   0.435866   1.765298   0.762238
min      4.300000   2.000000   1.000000   0.100000
25%     5.100000   2.800000   1.600000   0.300000
50%     5.800000   3.000000   4.350000   1.300000
75%     6.400000   3.300000   5.100000   1.800000
max     7.900000   4.400000   6.900000   2.500000
```

```
In [36]: plt.hist(df["sepal.length"])
```

```
Out[36]: (array([ 9., 23., 14., 27., 16., 26., 18., 6., 5., 6.]),
 array([4.3 , 4.66, 5.02, 5.38, 5.74, 6.1 , 6.46, 6.82, 7.18, 7.54, 7.9 ]),
 <BarContainer object of 10 artists>)
```



18(a).

```
In [37]: import pandas as pd
import matplotlib.pyplot as plt
df=pd.read_csv("diamonds.csv")
df.head()
```

```
Out[37]:
```

|   | Unnamed: 0 | carat | cut     | color | clarity | depth | table | price | x    | y    | z    |
|---|------------|-------|---------|-------|---------|-------|-------|-------|------|------|------|
| 0 | 1          | 0.23  | Ideal   | E     | SI2     | 61.5  | 55.0  | 326   | 3.95 | 3.98 | 2.43 |
| 1 | 2          | 0.21  | Premium | E     | SI1     | 59.8  | 61.0  | 326   | 3.89 | 3.84 | 2.31 |
| 2 | 3          | 0.23  | Good    | E     | VS1     | 56.9  | 65.0  | 327   | 4.05 | 4.07 | 2.31 |
| 3 | 4          | 0.29  | Premium | I     | VS2     | 62.4  | 58.0  | 334   | 4.20 | 4.23 | 2.63 |
| 4 | 5          | 0.31  | Good    | J     | SI2     | 63.3  | 58.0  | 335   | 4.34 | 4.35 | 2.75 |

```
In [39]: pd.Series.describe(df["cut"])
```

```
Out[39]: count    53940
unique     5
top      Ideal
freq    21551
Name: cut, dtype: object
```

```
In [40]: pd.Series.describe(df["color"])
```

```
Out[40]: count    53940
unique     7
top      G
freq    11292
Name: color, dtype: object
```

18(b)

```
In [41]: pd.Series(df["clarity"])
```

```
Out[41]: 0      SI2
1      SI1
2      VS1
3      VS2
4      SI2
...
53935   SI1
53936   SI1
53937   SI1
53938   SI2
53939   SI2
Name: clarity, Length: 53940, dtype: object
```

```
In [43]: df.hist(figsize=(10,10))
plt.tight_layout()
plt.show()
```

