answers

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1 Exam

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1.2 Write a NumPy program to convert an array to a floating type.

[1]:
```
import numpy as np

arr = [34, 2,4,65]

narr = np.array(arr, dtype=np.float32)

print(narr)
```

```
[34.  2.  4. 65.]
```

1.3 Write a NumPy program to convert a list and tuple into arrays

[2]:
```
listq2 = [3,5,8]
tupq2 = (34, 54, 65)
print(np.array(listq2))
print(np.array(tupq2))
```

```
[3 5 8]
[34 54 65]
```

1.4 Write a NumPy program to append values to the end of an array.

[17]:
```
arr = np.array([], dtype=np.int32)
arr = np.append(arr, [23])
arr = np.append(arr, [3])
arr = np.append(arr, [33])
print(arr)
```

```
[23  3 33]
```

1.5 Write a NumPy program to test whether each element of a 1-D array is also present in a second array.

[15]:
```
arr1 = [1,2,3,4]
arr2 = [4,5,7,8]
# print(np.in1d(arr1, arr2))
if np.all(np.in1d(arr1, arr2)):
    print("Each element is present in second arr")
else:
    print("Each element is not present in second arr")
```

```
Each element is not present in second arr
```

1.6 Write a NumPy program to find common values between two arrays

[16]:
```
arr1 = [1,2,3,4]
arr2 = [4,5,7,8]
# print(np.in1d(arr1, arr2))
ret = np.in1d(arr1, arr2)
if np.any(ret):
    print("common elements are their")
    for i in range(len(arr1)):
        if ret[i]:
            print(arr1[i])

else:
    print("common elements are not present")
```

```
common elements are their
4
```

1.7 Write a NumPy program to get the powers of an array values element-wise.

[18]:
```
arr = np.array([2,4,6])
exp = np.array([2,2,3])

print(np.power(arr, exp))
```

```
[  4  16 216]
```

1.8 Write a NumPy program to repeat all the elements three times of a given array of string

[19]:
```
a = [1, 2, 3, 4]
print(a)
x = np.tile(a, 2)
print(x)
```

```
[1, 2, 3, 4]
[1 2 3 4 1 2 3 4]
```

1.9 Write a Python Pandas program to get the columns of the DataFrame.

[24]:
```
import pandas as pd

df = pd.read_csv('data.csv')
print(df.columns)
```

```
Index(['gender', 'ssc_percentage', 'ssc_board', 'hsc_percentage', 'hsc_board',
       'hsc_subject', 'degree_percentage', 'undergrad_degree',
       'work_experience', 'emp_test_percentage', 'specialisation',
       'mba_percent', 'status'],
      dtype='object')
```

1.10 Write a Pandas program to get the information of the DataFrame including data types.

[22]:
```
print(df.info())
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 215 entries, 0 to 214
Data columns (total 13 columns):
 #   Column               Non-Null Count  Dtype
---  ------               --------------  -----
 0   gender               215 non-null    object
 1   ssc_percentage       215 non-null    float64
 2   ssc_board            215 non-null    object
 3   hsc_percentage       215 non-null    float64
 4   hsc_board            215 non-null    object
 5   hsc_subject          215 non-null    object
 6   degree_percentage    215 non-null    float64
 7   undergrad_degree     215 non-null    object
 8   work_experience      215 non-null    object
 9   emp_test_percentage  215 non-null    float64
 10  specialisation       215 non-null    object
 11  mba_percent          215 non-null    float64
 12  status               215 non-null    object
dtypes: float64(5), object(8)
memory usage: 22.0+ KB
None
```

1.11 Write a Pandas program to get the details of the third students of the DataFrame.

[28]:
```
print(df.iloc[2])
```

```
gender                          M
ssc_percentage               65.0
ssc_board                 Central
hsc_percentage               68.0
hsc_board                 Central
hsc_subject                  Arts
degree_percentage            64.0
undergrad_degree        Comm&Mgmt
work_experience                No
emp_test_percentage          75.0
specialisation            Mkt&Fin
mba_percent                  57.8
status                     Placed
Name: 2, dtype: object
```

1.12 Write a Pandas program to count the number of rows and columns of the DataFrame

[29]:
```
print(f"No of entities-> {len(df.axes[0])}")
print(f"No of attributes-> {len(df.axes[1])}")
```

```
No of entities-> 215
No of attributes-> 13
```

1.13 Write a Pandas program to create a smaller DataFrame with a subset of all features.

[33]:
```
print(df.iloc[:3].to_string())
```

```
  gender  ssc_percentage ssc_board  hsc_percentage hsc_board hsc_subject
degree_percentage undergrad_degree work_experience  emp_test_percentage
specialisation  mba_percent  status
0      M           67.00    Others           91.00    Others    Commerce
58.00         Sci&Tech              No                55.0         Mkt&HR
58.80  Placed
1      M           79.33   Central           78.33    Others     Science
77.48         Sci&Tech             Yes                86.5        Mkt&Fin
66.28  Placed
2      M           65.00   Central           68.00   Central        Arts
64.00        Comm&Mgmt              No                75.0        Mkt&Fin
57.80  Placed
```

1.14 Write a Pandas program to display the first 10 rows of the DataFrame

[37]:
```
print(df.head(10).to_string())
```

```
  gender  ssc_percentage ssc_board  hsc_percentage hsc_board hsc_subject
degree_percentage undergrad_degree work_experience  emp_test_percentage
specialisation  mba_percent      status
```

```
0      M           67.00    Others           91.00    Others    Commerce
58.00         Sci&Tech               No               55.00         Mkt&HR
58.80     Placed
1      M           79.33   Central           78.33    Others     Science
77.48         Sci&Tech              Yes               86.50        Mkt&Fin
66.28     Placed
2      M           65.00   Central           68.00   Central        Arts
64.00        Comm&Mgmt               No               75.00        Mkt&Fin
57.80     Placed
3      M           56.00   Central           52.00   Central     Science
52.00         Sci&Tech               No               66.00         Mkt&HR
59.43 Not Placed
4      M           85.80   Central           73.60   Central    Commerce
73.30        Comm&Mgmt               No               96.80        Mkt&Fin
55.50     Placed
5      M           55.00    Others           49.80    Others     Science
67.25         Sci&Tech              Yes               55.00        Mkt&Fin
51.58 Not Placed
6      F           46.00    Others           49.20    Others    Commerce
79.00        Comm&Mgmt               No               74.28        Mkt&Fin
53.29 Not Placed
7      M           82.00   Central           64.00   Central     Science
66.00         Sci&Tech              Yes               67.00        Mkt&Fin
62.14     Placed
8      M           73.00   Central           79.00   Central    Commerce
72.00        Comm&Mgmt               No               91.34        Mkt&Fin
61.29     Placed
9      M           58.00   Central           70.00   Central    Commerce
61.00        Comm&Mgmt               No               54.00        Mkt&Fin
52.21 Not Placed
```

1.15 Write a Pandas program to sort the DataFrame based on emp_test_percentage

[38]:
```
df.sort_values(by="emp_test_percentage",ascending=True)
```

[38]:
```
    gender  ssc_percentage ssc_board  hsc_percentage hsc_board hsc_subject  \
20       M            62.0    Others            65.0    Others    Commerce
190      F            64.0    Others            70.2   Central    Commerce
99       M            54.0   Central            82.0    Others    Commerce
19       M            60.0    Others            67.0    Others        Arts
32       F            61.0   Central            81.0   Central    Commerce
..     ...             ...       ...             ...       ...         ...
4        M            85.8   Central            73.6   Central    Commerce
206      M            41.0   Central            42.0   Central     Science
118      M            76.0   Central            80.0   Central     Science
24       M            76.5    Others            97.7    Others     Science
```

```
152      F            75.4    Others            60.5   Central     Science

     degree_percentage undergrad_degree work_experience  emp_test_percentage  \
20                66.00        Comm&Mgmt              No                50.00
190               61.00        Comm&Mgmt              No                50.00
99                63.00         Sci&Tech              No                50.00
19                70.00        Comm&Mgmt             Yes                50.48
32                66.40        Comm&Mgmt              No                50.89
..                  …              …              …                  …
4                 73.30        Comm&Mgmt              No                96.80
206               60.00        Comm&Mgmt              No                97.00
118               78.00         Sci&Tech             Yes                97.00
24                78.86         Sci&Tech              No                97.40
152               84.00         Sci&Tech              No                98.00

    specialisation  mba_percent      status
20          Mkt&HR        56.70      Placed
190        Mkt&Fin        62.50  Not Placed
99         Mkt&Fin        59.47  Not Placed
19         Mkt&Fin        77.89      Placed
32          Mkt&HR        62.21      Placed
..             …          …         …
4          Mkt&Fin        55.50      Placed
206        Mkt&Fin        53.39  Not Placed
118         Mkt&HR        70.48      Placed
24         Mkt&Fin        74.01      Placed
152        Mkt&Fin        65.25      Placed

[215 rows x 13 columns]
```

1.16 Write a Pandas program to access those student details, emp_test_percentage greater than 50.

[39]:
```
df[(df['emp_test_percentage'] > 50)]
```

[39]:
```
    gender  ssc_percentage ssc_board  hsc_percentage hsc_board hsc_subject  \
0        M           67.00    Others           91.00    Others    Commerce
1        M           79.33   Central           78.33    Others     Science
2        M           65.00   Central           68.00   Central        Arts
3        M           56.00   Central           52.00   Central     Science
4        M           85.80   Central           73.60   Central    Commerce
..     …             …       …              …       …          …
210      M           80.60    Others           82.00    Others    Commerce
211      M           58.00    Others           60.00    Others     Science
212      M           67.00    Others           67.00    Others    Commerce
213      F           74.00    Others           66.00    Others    Commerce
214      M           62.00   Central           58.00    Others     Science
```

```
     degree_percentage undergrad_degree work_experience  emp_test_percentage  \
0                58.00         Sci&Tech              No                 55.0
1                77.48         Sci&Tech             Yes                 86.5
2                64.00        Comm&Mgmt              No                 75.0
3                52.00         Sci&Tech              No                 66.0
4                73.30        Comm&Mgmt              No                 96.8
..                 …              …              …                  …
210              77.60        Comm&Mgmt              No                 91.0
211              72.00         Sci&Tech              No                 74.0
212              73.00        Comm&Mgmt             Yes                 59.0
213              58.00        Comm&Mgmt              No                 70.0
214              53.00        Comm&Mgmt              No                 89.0

    specialisation  mba_percent      status
0           Mkt&HR        58.80      Placed
1          Mkt&Fin        66.28      Placed
2          Mkt&Fin        57.80      Placed
3           Mkt&HR        59.43  Not Placed
4          Mkt&Fin        55.50      Placed
..             …            …          …
210        Mkt&Fin        74.49      Placed
211        Mkt&Fin        53.62      Placed
212        Mkt&Fin        69.72      Placed
213         Mkt&HR        60.23      Placed
214         Mkt&HR        60.22  Not Placed

[212 rows x 13 columns]
```

1.17 Write a Pandas program to get those student details whose ssc_percentage more than 50 and emp_test_percentage less than 60

[40]:
```
df[(df['emp_test_percentage'] < 60) & (df['ssc_percentage'] > 50)]
```

[40]:
```
    gender  ssc_percentage ssc_board  hsc_percentage hsc_board hsc_subject  \
0        M           67.00    Others           91.00    Others    Commerce
5        M           55.00    Others           49.80    Others     Science
9        M           58.00   Central           70.00   Central    Commerce
19       M           60.00    Others           67.00    Others        Arts
20       M           62.00    Others           65.00    Others    Commerce
22       F           69.80    Others           60.80    Others     Science
30       F           64.00   Central           73.50   Central    Commerce
32       F           61.00   Central           81.00   Central    Commerce
37       F           79.00   Central           76.00   Central     Science
38       F           73.00    Others           58.00    Others     Science
45       F           76.00   Central           64.00   Central     Science
59       M           52.60   Central           65.58    Others     Science
```

62	F	86.50	Others	64.20	Others	Science
84	M	70.00	Central	63.00	Others	Science
88	F	66.00	Central	62.00	Central	Commerce
94	M	58.00	Central	62.00	Central	Commerce
99	M	54.00	Central	82.00	Others	Commerce
102	F	77.00	Others	61.00	Others	Commerce
104	M	69.00	Central	63.00	Others	Science
110	F	69.50	Central	70.00	Central	Science
112	M	58.00	Others	61.00	Others	Commerce
114	M	65.00	Central	68.00	Others	Science
121	F	64.00	Central	67.00	Others	Science
127	F	72.00	Others	60.00	Others	Science
135	F	72.00	Central	56.00	Others	Science
137	M	67.00	Others	63.00	Central	Commerce
139	M	77.00	Central	70.00	Central	Commerce
140	M	65.00	Central	64.80	Others	Commerce
148	F	77.00	Central	86.00	Central	Arts
150	M	71.00	Central	58.66	Central	Science
155	M	51.57	Others	74.66	Others	Commerce
161	M	55.60	Others	51.00	Others	Commerce
164	F	67.16	Central	72.50	Central	Commerce
167	M	67.90	Others	62.00	Others	Science
169	M	59.96	Others	42.16	Others	Science
170	F	63.40	Others	67.20	Others	Commerce
176	F	59.00	Central	60.00	Others	Commerce
180	M	65.00	Central	71.50	Others	Commerce
186	F	52.00	Central	64.00	Central	Commerce
188	M	61.80	Others	47.00	Others	Commerce
190	F	64.00	Others	70.20	Central	Commerce
194	M	52.00	Others	55.00	Others	Commerce
197	F	83.96	Others	53.00	Others	Science
212	M	67.00	Others	67.00	Others	Commerce

	degree_percentage	undergrad_degree	work_experience	emp_test_percentage	\
0	58.00	Sci&Tech	No	55.00	
5	67.25	Sci&Tech	Yes	55.00	
9	61.00	Comm&Mgmt	No	54.00	
19	70.00	Comm&Mgmt	Yes	50.48	
20	66.00	Comm&Mgmt	No	50.00	
22	72.23	Sci&Tech	No	55.53	
30	73.00	Comm&Mgmt	No	52.00	
32	66.40	Comm&Mgmt	No	50.89	
37	65.60	Sci&Tech	No	58.00	
38	66.00	Comm&Mgmt	No	53.70	
45	72.00	Sci&Tech	No	58.00	
59	72.11	Sci&Tech	No	57.60	
62	67.40	Sci&Tech	No	59.00	

84	70.00	Sci&Tech	Yes	55.00
88	73.00	Comm&Mgmt	No	58.00
94	64.00	Comm&Mgmt	No	53.88
99	63.00	Sci&Tech	No	50.00
102	68.00	Comm&Mgmt	Yes	57.50
104	65.00	Comm&Mgmt	Yes	55.00
110	72.00	Sci&Tech	No	57.20
112	61.00	Comm&Mgmt	No	58.00
114	69.00	Comm&Mgmt	No	53.70
121	69.60	Sci&Tech	Yes	55.67
127	69.00	Comm&Mgmt	No	55.50
135	69.00	Comm&Mgmt	No	55.60
137	72.00	Comm&Mgmt	No	56.00
139	59.00	Comm&Mgmt	Yes	58.00
140	69.50	Comm&Mgmt	Yes	56.00
148	56.00	Others	No	57.00
150	58.00	Sci&Tech	Yes	56.00
155	59.90	Comm&Mgmt	Yes	56.15
161	57.50	Comm&Mgmt	No	57.63
164	63.35	Comm&Mgmt	No	53.04
167	67.00	Sci&Tech	Yes	58.10
169	61.26	Sci&Tech	No	54.48
170	60.00	Comm&Mgmt	No	58.06
176	56.00	Comm&Mgmt	No	55.00
180	62.80	Comm&Mgmt	Yes	57.00
186	61.00	Comm&Mgmt	No	55.00
188	54.38	Comm&Mgmt	No	57.00
190	61.00	Comm&Mgmt	No	50.00
194	56.30	Comm&Mgmt	No	59.00
197	91.00	Sci&Tech	No	59.32
212	73.00	Comm&Mgmt	Yes	59.00

	specialisation	mba_percent	status
0	Mkt&HR	58.80	Placed
5	Mkt&Fin	51.58	Not Placed
9	Mkt&Fin	52.21	Not Placed
19	Mkt&Fin	77.89	Placed
20	Mkt&HR	56.70	Placed
22	Mkt&HR	68.81	Placed
30	Mkt&HR	56.70	Placed
32	Mkt&HR	62.21	Placed
37	Mkt&HR	55.47	Placed
38	Mkt&HR	56.86	Placed
45	Mkt&HR	66.53	Not Placed
59	Mkt&Fin	56.66	Placed
62	Mkt&Fin	59.69	Placed
84	Mkt&Fin	62.00	Placed

```
88          Mkt&HR        64.36      Placed
94         Mkt&Fin        54.97      Placed
99         Mkt&Fin        59.47  Not Placed
102        Mkt&Fin        61.31      Placed
104         Mkt&HR        58.23      Placed
110         Mkt&HR        54.80      Placed
112         Mkt&HR        53.94      Placed
114         Mkt&HR        55.01      Placed
121         Mkt&HR        71.49      Placed
127         Mkt&HR        58.40      Placed
135         Mkt&HR        65.63      Placed
137         Mkt&HR        60.41      Placed
139        Mkt&Fin        54.43      Placed
140        Mkt&Fin        56.94      Placed
148        Mkt&Fin        64.08      Placed
150        Mkt&Fin        61.30      Placed
155         Mkt&HR        65.99  Not Placed
161         Mkt&HR        62.72  Not Placed
164        Mkt&Fin        65.52      Placed
167        Mkt&Fin        75.71  Not Placed
169         Mkt&HR        65.48  Not Placed
170         Mkt&HR        69.28  Not Placed
176         Mkt&HR        57.90      Placed
180        Mkt&Fin        56.60      Placed
186        Mkt&Fin        62.93  Not Placed
188        Mkt&Fin        56.13  Not Placed
190        Mkt&Fin        62.50  Not Placed
194        Mkt&Fin        64.74  Not Placed
197         Mkt&HR        69.71      Placed
212        Mkt&Fin        69.72      Placed
```

1.18 Write a Pandas program find out the ratio of placed and non-placed students

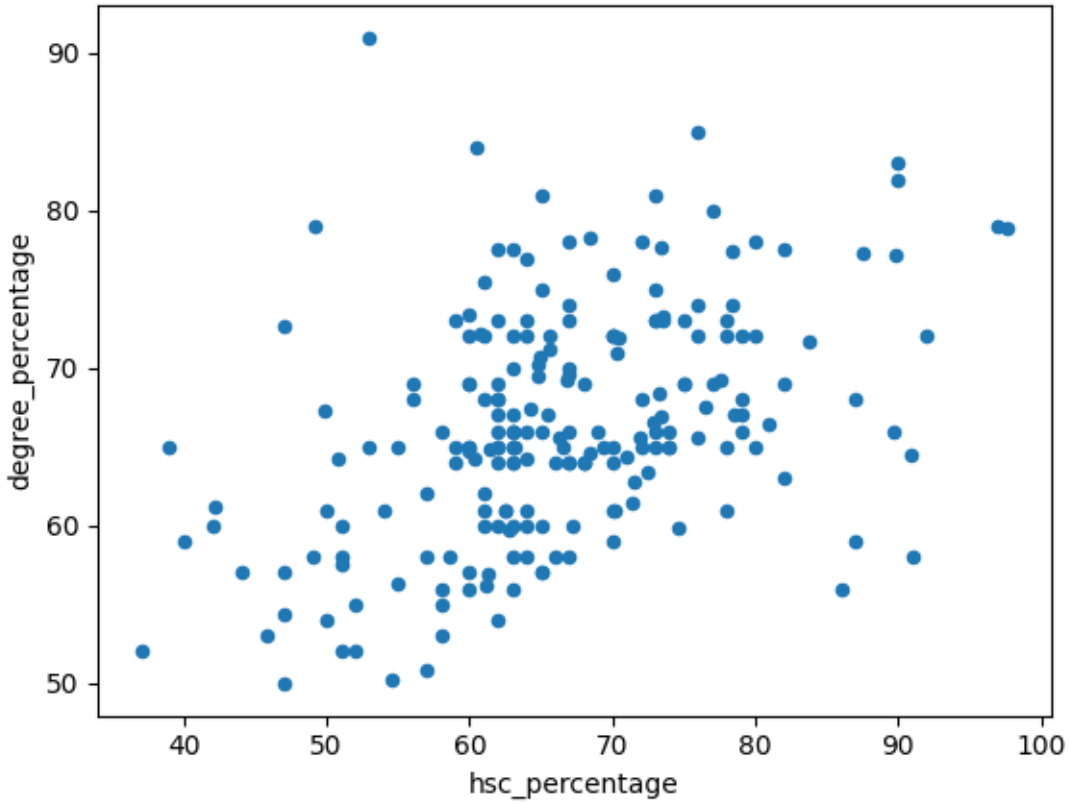
[48]:
```
noOfPlaced = len(df[(df['status'] == 'Placed')])
noOfNotPlaced = len(df[(df['status'] == 'Not Placed')])
print(noOfPlaced)
print(noOfNotPlaced)
```

```
148
67
```

1.19 Scatter Plot

[50]:
```
import matplotlib.pyplot as plt
df.plot(kind = 'scatter', x = 'hsc_percentage', y = 'degree_percentage')
plt.plot()
```

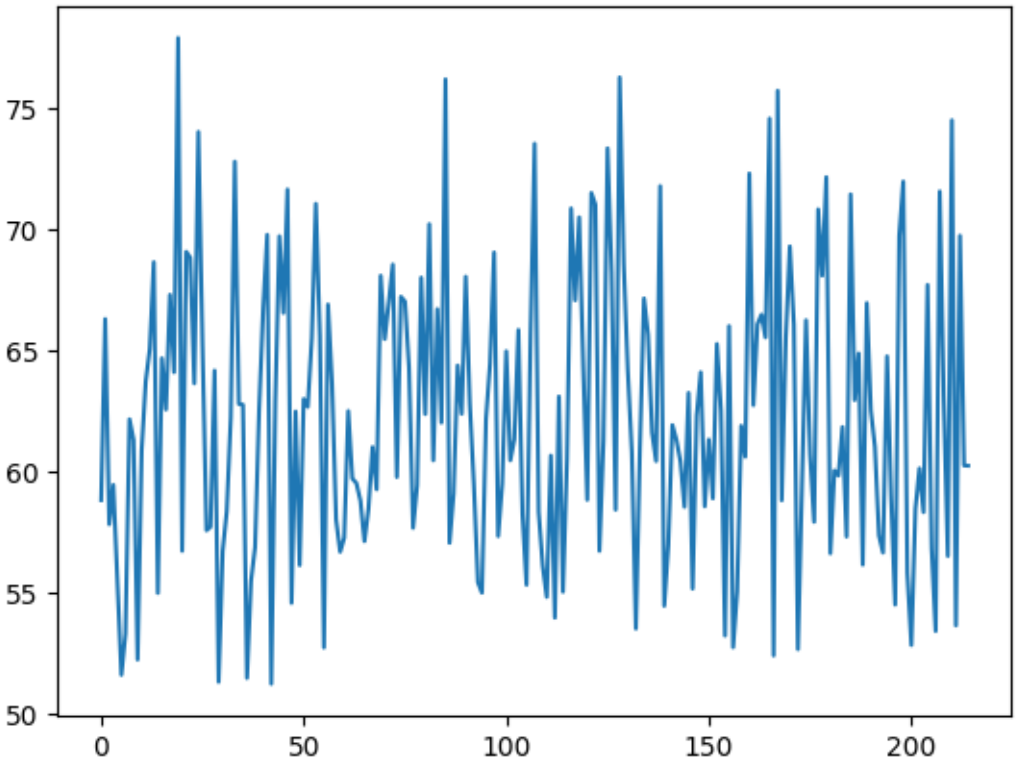
[50]: []



1.20 Line plot

[51]:
```
df['mba_percent'].plot(kind = 'line')
plt.plot()
```

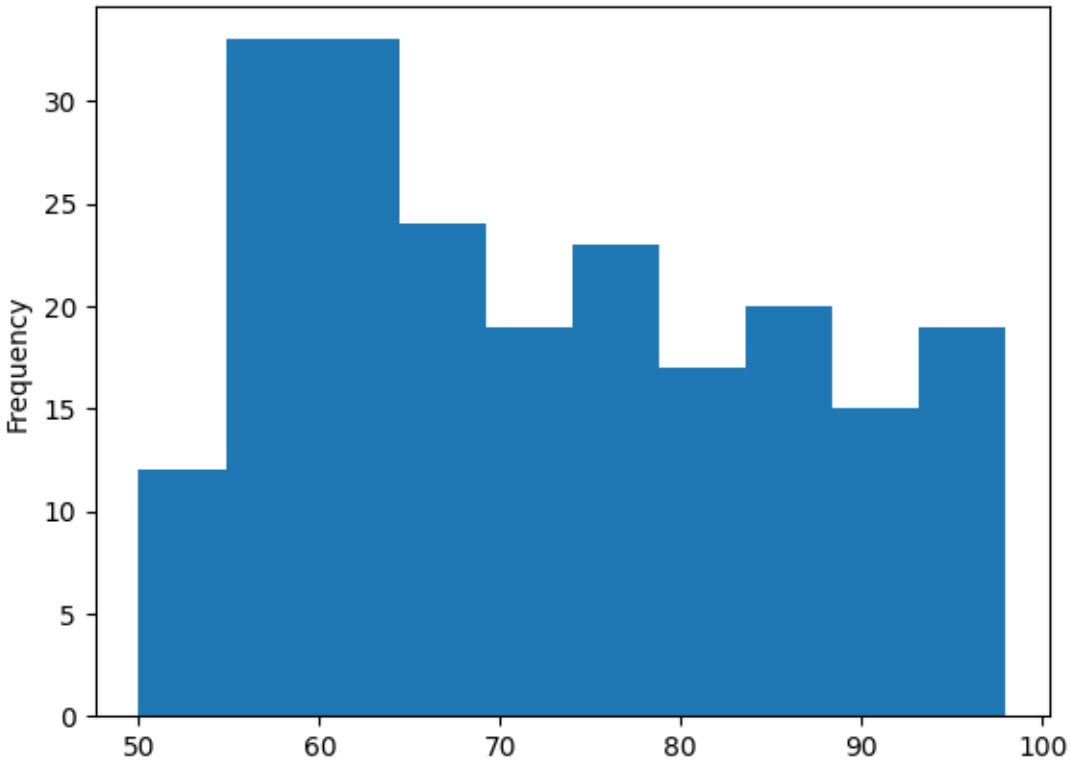
[51]: []



1.21 Histogram plot

[54]:
```
df['emp_test_percentage'].plot(kind='hist')
plt.plot()
```

[54]: []


Frequency
0
5
10
15
20
25
30
50
60
70
80
90
100