**Exercise 4: Python Pandas Exercises**

1. Write a Pandas program to create and display a one-dimensional array-like object containing an array of data using Pandas module.
2. Write a Pandas program to convert a Panda module Series to Python list and it's type.
3. Write a Pandas program to add, subtract, multiple and divide two Pandas Series.   
   Sample Series: [2, 4, 6, 8, 10], [1, 3, 5, 7, 9]
4. Write a Pandas program to compare the elements of the two Pandas Series.   
   Sample Series: [2, 4, 6, 8, 10], [1, 3, 5, 7, 10]
5. Write a Pandas program to convert a NumPy array to a Pandas series.
6. Write a Pandas program to change the data type of given a column or a Series.
7. Write a Pandas program to convert the first column of a DataFrame as a Series.
8. Write a Pandas program to convert a dictionary to a Pandas series.
9. Write a Pandas program to add some data to an existing Series.
10. Write a Pandas program to create a subset of a given series based on value and condition.
11. Write a Pandas program to create a dataframe from a dictionary and display it. Sample data: {'X':[78,85,96,80,86], 'Y':[84,94,89,83,86],'Z':[86,97,96,72,83]}
12. Write a Pandas program to create and display a DataFrame from a specified dictionary data which has the index labels.   
    Sample Python dictionary data and list labels:  
    exam\_data = {'name': ['Anastasia', 'Dima', 'Katherine', 'James', 'Emily', 'Michael', 'Matthew', 'Laura', 'Kevin', 'Jonas'],  
    'score': [12.5, 9, 16.5, np.nan, 9, 20, 14.5, np.nan, 8, 19],  
    'attempts': [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],  
    'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}  
    labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j']
13. Write a Pandas program to display a summary of the basic information about a specified DataFrame and its data.   
    Sample Python dictionary data and list labels:  
    exam\_data = {'name': ['Anastasia', 'Dima', 'Katherine', 'James', 'Emily', 'Michael', 'Matthew', 'Laura', 'Kevin', 'Jonas'],  
    'score': [12.5, 9, 16.5, np.nan, 9, 20, 14.5, np.nan, 8, 19],  
    'attempts': [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],  
    'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}  
    labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j']
14. Write a Pandas program to get the first 3 rows of a given DataFrame.   
    Sample Python dictionary data and list labels:  
    exam\_data = {'name': ['Anastasia', 'Dima', 'Katherine', 'James', 'Emily', 'Michael', 'Matthew', 'Laura', 'Kevin', 'Jonas'],  
    'score': [12.5, 9, 16.5, np.nan, 9, 20, 14.5, np.nan, 8, 19],  
    'attempts': [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],  
    'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}  
    labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j']
15. Write a Pandas program to select the 'name' and 'score' columns from the following DataFrame.   
    Sample Python dictionary data and list labels:  
    exam\_data = {'name': ['Anastasia', 'Dima', 'Katherine', 'James', 'Emily', 'Michael', 'Matthew', 'Laura', 'Kevin', 'Jonas'],  
    'score': [12.5, 9, 16.5, np.nan, 9, 20, 14.5, np.nan, 8, 19],  
    'attempts': [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],  
    'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}  
    labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j']
16. Write a Pandas program to select the rows where the number of attempts in the examination is greater than 2.   
    Sample Python dictionary data and list labels:  
    exam\_data = {'name': ['Anastasia', 'Dima', 'Katherine', 'James', 'Emily', 'Michael', 'Matthew', 'Laura', 'Kevin', 'Jonas'],  
    'score': [12.5, 9, 16.5, np.nan, 9, 20, 14.5, np.nan, 8, 19],  
    'attempts': [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],  
    'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}  
    labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j']
17. Write a Pandas program to count the number of rows and columns of a DataFrame.   
    Sample Python dictionary data and list labels:  
    exam\_data = {'name': ['Anastasia', 'Dima', 'Katherine', 'James', 'Emily', 'Michael', 'Matthew', 'Laura', 'Kevin', 'Jonas'],  
    'score': [12.5, 9, 16.5, np.nan, 9, 20, 14.5, np.nan, 8, 19],  
    'attempts': [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],  
    'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}  
    labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j']
18. Write a Pandas program to select the rows the score is between 15 and 20 (inclusive).   
    Sample Python dictionary data and list labels:  
    exam\_data = {'name': ['Anastasia', 'Dima', 'Katherine', 'James', 'Emily', 'Michael', 'Matthew', 'Laura', 'Kevin', 'Jonas'],  
    'score': [12.5, 9, 16.5, np.nan, 9, 20, 14.5, np.nan, 8, 19],  
    'attempts': [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],  
    'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}  
    labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j']
19. Write a Pandas program to select the rows where number of attempts in the examination is less than 2 and score greater than 15.   
    Sample Python dictionary data and list labels:  
    exam\_data = {'name': ['Anastasia', 'Dima', 'Katherine', 'James', 'Emily', 'Michael', 'Matthew', 'Laura', 'Kevin', 'Jonas'],  
    'score': [12.5, 9, 16.5, np.nan, 9, 20, 14.5, np.nan, 8, 19],  
    'attempts': [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],  
    'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}  
    labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j']
20. Write a Pandas program to extract items at given positions of a given series.