```
In [1]: |#Neha Nemade
        #Roll_no:22150
        '''1. Numeric Data type
In [3]:
              a) Int
              b)Float
              c)Complex '''
        # Int data type
        x = 10
        y = 20
        z = x + y
        print("Data type of the variable x is :-",type(x))
        print("Data type of the variable y is :-",type(y))
        print("Data type of the variable y is :-",type(y))
        print("The value of z is:-",z)
        Data type of the variable x is :- <class 'int'>
        Data type of the variable y is :- <class 'int'>
        Data type of the variable y is :- <class 'int'>
        The value of z is:- 30
In [4]: # float data type
        k = 52.66
        print("\nThe data type of variable k is:- ",type(k))
        The data type of variable k is:- <class 'float'>
In [5]: # complex data type
        m = complex(x,y)
        print("\nThe complex value of m is :-",m)
        print("The type of the variable m is:-",type(m))
        The complex value of m is :- (10+20j)
        The type of the variable m is:- <class 'complex'>
In [6]: # int to float and vice versa
        print("\nThe integer part of k is :-",int(k))
        print("The float value of x is :-",float(y))
        The integer part of k is :- 52
        The float value of x is :- 20.0
```

```
In [7]: '''2.Boolean datatype'''
        # Examples of boolean data type
        p = True
        print("\nThe type of variable p is:-",type(p))
        k = 1>8
        print("The result of k is:-",k)
        f = 45 < 96
        print("The result of f is:-",f)
        The type of variable p is:- <class 'bool'>
        The result of k is:- False
        The result of f is:- True
In [8]: # We can get the integer notation of the boolean as follows :-
        print(int(k))
        print(int(f))
        print()
        '''3.Sequence data types
            a)String
            b)List
            c)Tuple'''
        0
        1
Out[8]: '3.Sequence data types \n a)String \n b)List\n c)Tuple'
In [6]: # String data type
        a = "Neha"
        print(a)
        s = "My name is Neha Nemade"
        print(s)
        print("The data type of the variable a is:-",type(a))
        print("The data type of the variable s is:-",type(s))
        print()
        # Various methods in strings
        k = "Neha"
        Neha
        My name is Neha Nemade
        The data type of the variable a is:- <class 'str'>
        The data type of the variable s is:- <class 'str'>
```

```
In [7]: #1. Length of string
        print("The length of the string is:-",len(k))
        #2. Upper case
        print("The upper case of k is",k.upper())
        #2. Lower case
        print("The lower case of k is",k.lower())
        #3. Capitalize
        k.capitalize()
        s = "My name is Neha Nemade"
        The length of the string is:- 4
        The upper case of k is NEHA
        The lower case of k is neha
In [8]: #4. title() converts first letter of sentence to upper case
        print(s.title())
        print()
        a = "Python"
        b = "Strings"
        c = a+b
        print("The string after concatenation is :-",c)
        #If we want space we can do as
        d = a+" "+b
        print("The string after concatenation is :-",d)
        My Name Is Neha Nemade
        The string after concatenation is :- PythonStrings
        The string after concatenation is :- Python Strings
In [9]: # string indexing
        print("The first five letters of the string s are :-",s[0:5])
        print()
        #List data type
        list = [5,9,55,'Neha',2,'python']
        print(list)
        print("The data type of list is ",type(list))
        # slicing
        print(list[0:4])
        # list is mutable ie we can modify the elements
        list[2]='k'
        print(list)
        print(type(list))
        The first five letters of the string s are :- My na
        [5, 9, 55, 'Neha', 2, 'python']
        The data type of list is <class 'list'>
        [5, 9, 55, 'Neha']
        [5, 9, 'k', 'Neha', 2, 'python']
        <class 'list'>
```

```
In [1]: #Neha Nemade
        #Roll no:22150
In [1]: import os
        import pandas as pd
        import numpy as np
        os.chdir("C:\Pandas")
        car=pd.read_csv('Toyota.csv',index_col=0)
In [2]: car.index
Out[2]: Int64Index([
                        0,
                              1,
                                    2,
                                          3,
                                                4,
                                                      5,
                                                             6,
                                                                   7,
                                                                         8,
                                                                               9,
                     1426, 1427, 1428, 1429, 1430, 1431, 1432, 1433, 1434, 1435],
                    dtype='int64', length=1436)
In [3]: car.columns
Out[3]: Index(['Price', 'Age', 'KM', 'FuelType', 'HP', 'MetColor', 'Automatic', 'CC',
                'Doors', 'Weight'],
              dtype='object')
In [4]: car.size
Out[4]: 14360
In [5]: car.shape
Out[5]: (1436, 10)
In [6]: #memory use by each column in bytes
        car.memory_usage()
Out[6]: Index
                      11488
        Price
                      11488
        Age
                      11488
        KM
                      11488
        FuelType
                      11488
        HP
                      11488
        MetColor
                      11488
        Automatic
                      11488
        CC
                      11488
        Doors
                      11488
        Weight
                      11488
        dtype: int64
In [7]: car.ndim
Out[7]: 2
```

In [8]: #indexing
 #head-return first n rows
 car.head(5)

Out[8]:

		Price	Age	KM	FuelType	HP	MetColor	Automatic	CC	Doors	Weight
_	0	13500	23.0	46986	Diesel	90	1.0	0	2000	three	1165
	1	13750	23.0	72937	Diesel	90	1.0	0	2000	3	1165
	2	13950	24.0	41711	Diesel	90	NaN	0	2000	3	1165
	3	14950	26.0	48000	Diesel	90	0.0	0	2000	3	1165
	4	13750	30.0	38500	Diesel	90	0.0	0	2000	3	1170

Out[9]:

	Price	Age	KM	FuelType	HP	MetColor	Automatic	CC	Doors	Weight
1431	7500	NaN	20544	Petrol	86	1.0	0	1300	3	1025
1432	10845	72.0	??	Petrol	86	0.0	0	1300	3	1015
1433	8500	NaN	17016	Petrol	86	0.0	0	1300	3	1015
1434	7250	70.0	??	NaN	86	1.0	0	1300	3	1015
1435	6950	76.0	1	Petrol	110	0.0	0	1600	5	1114

In [10]: #label based scalar lookup:
 #selecting data based on label using 'at'
 #getting data of row 4 coloum with label 'KM'
 car.at[4,'KM']

Out[10]: '38500'

Out[11]: 1170

In []: #PANDAS 2

```
In [12]:
         1) Data Types
          Numeric(int64,float64)
          Character(category,object)
          2) checking Data types each column
          3) count of unique data types
          4) selecting data based on data type
          5)Concise summary of dataframe
          6)Checking Format of each column
          7)Getting Unique elements of each column
Out[12]: '\n1) Data Types\n Numeric(int64,float64)\n Character(category,object)\n 2)chec
         king Data types each column\n 3)count of unique data types\n 4)selecting data b
         ased on data type\n 5)Concise summary of dataframe\n 6)Checking Format of each
         column\n 7)Getting Unique elements of each column\n '
In [14]: import os
         import numpy as np
         os.chdir("C:\Pandas")
         car=pd.read csv('Toyota.csv',index col=0)
In [15]: #checking data types each column
         car.dtypes
Out[15]: Price
                         int64
                       float64
         Age
         KM
                       object
         FuelType
                       object
         HP
                       object
                       float64
         MetColor
         Automatic
                         int64
         CC
                         int64
         Doors
                       object
                         int64
         Weight
         dtype: object
In [17]: #count of unique data types
         car.dtypes.value_counts()
Out[17]: object
                     4
         int64
                    4
                     2
         float64
         dtype: int64
```

Out[18]:

		Price	Age	MetColor	Automatic	CC	Weight
	0	13500	23.0	1.0	0	2000	1165
	1	13750	23.0	1.0	0	2000	1165
	2	13950	24.0	NaN	0	2000	1165
	3	14950	26.0	0.0	0	2000	1165
	4	13750	30.0	0.0	0	2000	1170
143	31	7500	NaN	1.0	0	1300	1025
143	32	10845	72.0	0.0	0	1300	1015
143	33	8500	NaN	0.0	0	1300	1015
143	34	7250	70.0	1.0	0	1300	1015
143	35	6950	76.0	0.0	0	1600	1114

1436 rows × 6 columns

In [19]: #concise summary of data frame and checking format of each column

car.info()

<class 'pandas.core.frame.DataFrame'>
Int64Index: 1436 entries, 0 to 1435
Data columns (total 10 columns):

Ducu	COTAMILIS (C	ocar io coramno,	•					
#	Column	Non-Null Count	Dtype					
0	Price	1436 non-null	int64					
1	Age	1336 non-null	float64					
2	KM	1436 non-null	object					
3	FuelType	1336 non-null	object					
4	HP	1436 non-null	object					
5	MetColor	1286 non-null	float64					
6	Automatic	1436 non-null	int64					
7	CC	1436 non-null	int64					
8	Doors	1436 non-null	object					
9	Weight	1436 non-null	int64					
<pre>dtypes: float64(2), int64(4), object(4)</pre>								
memory usage: 123.4+ KB								

In [20]: #Getting unique elements of each column

```
print(np.unique(car['KM']))
```

```
['1' '10000' '100123' ... '99865' '99971' '??']
```

```
In [21]: |print(np.unique(car['HP']))
     ['107' '110' '116' '192' '69' '71' '72' '73' '86' '90' '97' '98' '????']
In [22]: print(np.unique(car['MetColor']))
        nan nan nan nan nan nan nan]
In [23]: print(np.unique(car['Automatic']))
     [0 1]
In [24]: |print(np.unique(car['Doors']))
     ['2' '3' '4' '5' 'five' 'four' 'three']
In [25]: #Pandas 3
In [26]:
     1)importing data
     2)concise summary of dataframe
     3)converting variable's data types
     4) category vs object data types
     5) cleaning column 'Doors'
     6)Getting count of missing values
Out[26]:
     "\n1)importing data\n2)concise summary of dataframe\n3)converting variable's da
     ta types\n4)category vs object data types\n5)cleaning column 'Doors'\n6)Getting
     count of missing values\n"
```

```
In [27]: # importing data
         import os
         import numpy as np
         os.chdir("C:\Pandas")
         car=pd.read csv('Toyota.csv',index col=0)
         car.info()
         <class 'pandas.core.frame.DataFrame'>
         Int64Index: 1436 entries, 0 to 1435
         Data columns (total 10 columns):
              Column
                          Non-Null Count Dtype
               ----
          - - -
          0
              Price
                          1436 non-null
                                          int64
          1
                          1336 non-null
                                          float64
              Age
          2
                          1436 non-null
                                          object
              ΚM
          3
              FuelType
                          1336 non-null
                                          object
          4
              HP
                          1436 non-null
                                          object
          5
              MetColor
                          1286 non-null
                                          float64
          6
              Automatic 1436 non-null
                                          int64
          7
                          1436 non-null
                                          int64
          8
              Doors
                          1436 non-null
                                          object
          9
              Weight
                          1436 non-null
                                          int64
         dtypes: float64(2), int64(4), object(4)
         memory usage: 123.4+ KB
         #concise summary of dataframe: Now , importing the data considering data frames
In [28]:
         car=pd.read_csv('Toyota.csv',index_col=0,na_values=["??","???"])
         car.info()
         <class 'pandas.core.frame.DataFrame'>
         Int64Index: 1436 entries, 0 to 1435
         Data columns (total 10 columns):
                          Non-Null Count Dtype
          #
              Column
          0
              Price
                          1436 non-null
                                          int64
                          1336 non-null
                                          float64
          1
              Age
          2
                          1421 non-null
                                          float64
              ΚM
          3
              FuelType
                          1336 non-null
                                          object
          4
                          1436 non-null
                                          object
          5
              MetColor
                          1286 non-null
                                          float64
              Automatic 1436 non-null
                                          int64
          6
          7
              CC
                          1436 non-null
                                          int64
          8
              Doors
                          1436 non-null
                                          object
              Weight
                          1436 non-null
                                          int64
         dtypes: float64(3), int64(4), object(3)
         memory usage: 123.4+ KB
```

```
In [30]: #converting data types
         car['MetColor']=car['MetColor'].astype('object')
         car['Automatic']=car['Automatic'].astype('object')
         car.info()
         <class 'pandas.core.frame.DataFrame'>
         Int64Index: 1436 entries, 0 to 1435
         Data columns (total 10 columns):
              Column
                         Non-Null Count Dtype
                          _____
                                          _ _ _ _ _
              Price
                                          int64
          0
                         1436 non-null
          1
              Age
                         1336 non-null
                                          float64
          2
                         1421 non-null
                                          float64
              ΚM
          3
              FuelType
                         1336 non-null
                                          object
          4
                         1436 non-null
                                          object
              HP
          5
              MetColor
                         1286 non-null
                                          object
              Automatic 1436 non-null
                                          object
          6
          7
              CC
                         1436 non-null
                                          int64
              Doors
          8
                         1436 non-null
                                          object
          9
              Weight
                         1436 non-null
                                          int64
         dtypes: float64(2), int64(3), object(5)
         memory usage: 123.4+ KB
In [31]: #category vs data object type
         print('Memory whwn data is of object Type')
         car['FuelType'].nbytes
         Memory whwn data is of object Type
Out[31]: 11488
In [32]: print('Memory whwn data is of category Type')
         car['FuelType'].astype('category').nbytes
         Memory whwn data is of category Type
Out[32]: 1460
In [33]: #cleaning column doors
         #useof replace()
         print(np.unique(car['Doors']))
         car['Doors'].replace('three',3,inplace=True)
         car['Doors'].replace('four',4,inplace=True)
         car['Doors'].replace('five',5,inplace=True)
         ['2' '3' '4' '5' 'five' 'four' 'three']
In [34]: | car['Doors']=car['Doors'].astype('int64')
         print(np.unique(car['Doors']))
         [2 3 4 5]
```

```
In [35]: #Getting count of missing values
          car.isnull().sum()
Out[35]: Price
                           0
          Age
                         100
          ΚM
                          15
          FuelType
                         100
          HP
                           0
          {\tt MetColor}
                         150
          Automatic
                           0
          \mathsf{CC}
                           0
          Doors
                           0
          Weight
                           0
          dtype: int64
 In [ ]:
```

```
In [ ]: #Neha Nemade
        #Roll no:22150
In [1]: my_list=[1,2,3,4,5,6]
        print(my_list)
        [1, 2, 3, 4, 5, 6]
In [2]: import numpy as np
In [3]:
        array=np.array(my_list,dtype=int)
        print(array)
        [1 2 3 4 5 6]
In [4]: print(type(array))
        print(len(array))
        print(array.ndim)
        print(array.shape)
        <class 'numpy.ndarray'>
        6
        1
         (6,)
In [5]: | array2=array.reshape(3,2)
        print(array2)
        array2.shape
        [[1 2]
         [3 4]
         [5 6]]
Out[5]: (3, 2)
In [7]: array3=array.reshape(3,-1)
        print(array3)
        print(array3.ndim)
        [[1 2]
         [3 4]
         [5 6]]
```

```
In [11]: ##Intializing numpy arrays from nested python lists
         my_list2=[1,2,3,4,5]
         my list3=[2,3,4,5,6]
         my_list4=[9,7,6,8,9]
         mul_arr=np.array([my_list2,my_list3,my_list4])
         print(mul arr)
         print(mul arr.shape)
         [[1 2 3 4 5]
          [2 3 4 5 6]
          [9 7 6 8 9]]
         (3, 5)
In [12]: mul arr.reshape(1,15)
Out[12]: array([[1, 2, 3, 4, 5, 2, 3, 4, 5, 6, 9, 7, 6, 8, 9]])
In [13]: #NUMPY Attributes
         a=np.array([[1,2,3],[4,5,6]])
         print(a.shape)
         (2, 3)
In [14]: #reshaping the ndarray
         a.shape=(3,2)
         print(a)
         [[1 2]
          [3 4]
          [5 6]]
In [15]: #reshape function to resize an array
         b=a.reshape(3,2)
         print(b)
         [[1 2]
          [3 4]
          [5 6]]
In [22]: r=range(24)
         print(r)
         range(0, 24)
```

```
In [23]: #an array of evenly spaced numbers
         a=np.arange(24)
         print(a)
         print(a.ndim)
         [ 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23]
In [24]: #reshaping the array 'a'
         b=a.reshape(6,4,1)
         print(b)
         [[[ 0]]
           [ 1]
           [ 2]
           [ 3]]
          [[ 4]
           [5]
           [ 6]
           [ 7]]
          [[ 8]]
           [ 9]
           [10]
           [11]]
          [[12]
           [13]
           [14]
           [15]]
          [[16]
           [17]
           [18]
           [19]]
          [[20]
           [21]
           [22]
           [23]]]
In [26]: #dtype of array is int8(1 byte)
         x=np.array([1,2,3,4,5],dtype=np.int8)
         print(x.itemsize)
         1
In [27]: #dtype of array is now float32(4 bytes)
         x=np.array([1,2,3,4,5],dtype=np.float32)
         print(x.itemsize)
         4
```

```
In [29]: x=np.array([[1,2],[3,4]],dtype=np.float64)
         y=np.array([[5,6],[7,8]],dtype=np.float64)
         print(x)
         print(y)
         [[1. 2.]
          [3. 4.]]
         [[5. 6.]
          [7.8.]]
In [30]: print(x+y)
         print(np.add(x,y))
         [[ 6. 8.]
          [10. 12.]]
         [[ 6. 8.]
          [10. 12.]]
In [32]: print(x-y)
         print(np.subtract(x,y))
         [[-4. -4.]
          [-4. -4.]]
         [[-4. -4.]
          [-4. -4.]]
In [33]: print(x*y)
         print(np.multiply(x,y))
         print(x.dot(y))
         [[ 5. 12.]
          [21. 32.]]
         [[ 5. 12.]
          [21. 32.]]
         [[19. 22.]
          [43. 50.]]
In [34]: print(x.dot(y))
         print(np.dot(x,y))
         [[19. 22.]
          [43. 50.]]
         [[19. 22.]
          [43. 50.]]
In [35]: print(x/y)
         print(np.divide(x,y))
         [[0.2
                       0.33333333]
          [0.42857143 0.5
                                 ]]
         [[0.2
                       0.33333333]
          [0.42857143 0.5
                                 ]]
```

```
In [ ]: #ROLL NO:22150
        #Name: Neha Nemade
In [1]: import sqlite3 as sq
In [2]: db=sq.connect('Employee.db')
In [3]: cur=db.cursor()
In [4]: cur.execute('''CREATE TABLE employee7(Emp_Id text(20) primary key , Name text(20)
Out[4]: <sqlite3.Cursor at 0x149eabf08f0>
In [5]: def new entry(cur,db):
            Emp_ID=input('Enter the Emp_ID of employee: ')
            Name=input('Enter the Name: ')
            DoB=input('DoB of employee: ')
            Qualification=input('Enter Qualification of the employee : ')
            Adhar=int(input('Enter the Adhar no. of employee: '))
            PAN=input('Enter the Pan no. of employee: ')
            try:
                cur.execute('''insert into employee values(?,?,?,?,?)''',(Emp_ID, Name
                db.commit()
            except:
                print('Enter unique Emp ID')
```

```
In [6]: def display(cur):
          cur.execute('''select * from employee ''')
          if cur:
                for i in cur:
                     print(i)
          else:
                print('Db is empty')
```

```
In [8]: def delete(cur,db):
            Emp_ID=input('Enter Emp_ID which u want to delete: ')
            cur.execute('''SELECT * from employee where Emp_ID is "{}"'''.format(Emp_ID)
                cur.execute('''DELETE from employee
                                WHERE Emp_ID="{}";'''.format(Emp_ID))
                print('Emp ID do not exit')
In [9]: print("\t-----")
        print('\t1.Create New Data Entry\n\t2.Display All Data\n\t3.Update Data\n\t4.Del
        print("\t-----")
        while(True):
            c=int(input('Enter your choice'))
            if(c==1):
                new_entry(cur,db)
            elif(c==2):
                display(cur)
            elif(c==3):
                update(cur,db)
            elif(c==4):
                delete(cur,db)
                print('You have quit !!!')
                break;
                1.Create New Data Entry
                2.Display All Data
                3. Update Data
                4. Delete Data Entry
                5.Exit
        Enter your choice1
        Enter the Emp_ID of employee: Neha
        Enter the Name: Neha
        DoB of employee: 05/06/01
        Enter Qualification of the employee : se
        Enter the Adhar no. of employee: 852140000
        Enter the Pan no. of employee: gfh2222
        Enter your choice2
        ('Neha', 'Neha1', '05/06/01', 'se', 852140000, 'gfh2222')Enter
        your choice3
        Enter Emp_ID which u want to update: Neha
        Enter the Name: Prasad
        DoB of employee: 21/5/2002
        Enter Qualification of the employee : 12
        Enter the Adhar no. of employee: 782100000
        Enter the Pan no. of employee: bgf34
        Enter your choice2
        ('Neha', 'Prasad', '21/5/2002', '12', 782100000, 'bgf34')
        Enter your choice6
        You have quit !!!
```

In []:		

```
In [ ]: #ROLL NO:22150
        #NAME: Neha Kamalakar Nemade
In [1]: import os
In [2]: os.chdir('C:/Users/ADMIN/Desktop/My DataBase')
In [3]: import sqlite3 as sq
        db = sq.connect('mynewdb.db')
        cur = db.cursor()
        cur.execute('''create table mynewtab14(Roll_no integer primary key, Name text, M
        db.close()
In [4]: | db = sq.connect('mynewdb.db')
        cur = db.cursor()
        cur.execute('''insert into mynewtab14
        values(1, 'Siddhant',99);''')db.commit()
        db.close()
In [5]: db = sq.connect('mynewdb.db')
        cur = db.cursor()
        cur.execute('''insert into mynewtab14
        values(2, 'Gayatri', 89); ''')db.commit()
        db.close()
In [6]: | db = sq.connect('mynewdb.db')
        cur = db.cursor()
        cur.execute('''insert into mynewtab14 values(3,'Neha',80);''')
        db.commit()
        db.close()
In [7]: | db = sq.connect('mynewdb.db')
        cur = db.cursor()
        cur.execute('''select * from mynewtab11;''')
        x = cur.fetchall()
        print(x)
        db.close()
        [(1, 'Siddhant', 99), (2, 'Gayatri', 89), (3, 'Neha', 80)]
```

```
In [8]: mydb = sq.connect('myschool.db')
         mycur = mydb.cursor()
         myid = int(input("Enter ID : "))
         myname = input("Enter Name : ")
         mymarks = float(input("Enter marks : "))
         mydb.commit()
         mydb.close()
         Enter ID: 45
         Enter Name : Neha
         Enter marks: 45
 In [9]: def insertdata(myid, myname, mymarks):
             db = sq.connect('myschool.db')
             cur = db.cursor()
             cur.execute('''create table mynewtab15(Roll no integer primary key, Name tex
             q = '''insert into mynewtab15 values(4,"savani",90);'''
             data = (myid, myname, mymarks)
             #cur.execute(q,data)
             db.commit()
             db.close()
         insertdata(10, 'Gayatri', 45)
In [10]: | def update(myatt,myval,myid):
             db=sq.connect('mydb.db')
             cur=db.cursor()
             if(myatt=='Name'):
                 q='''update mynewtab15 set Name='savani' where ID= 4'''
             elif(myatt== 'Division'):
                  q='''update mynewtab15 set Division="shruti" '''
             data=(myval,myid)
             #cur.execute(q,data)
             print('updated successfully ..\n')
             db.close()
             display()
         update('Name','Thomas',7)
                                       #Updatename
         update('Division','c',7)
                                       #UpdateDivision
         updated successfully ...
         updated successfully ..
 In [ ]:
```