```
import pickle as pk
import array as arr
import time
import math
import random

#python exercises
#1. array,list,set,dictionary
#2. modules and function
#3. file handling
#4. exception handling
#5. inheritance

#1(a) array
print("ARRAY IN PYTHON")
print()
colours = [1,2,3,4,5]
x=colours[1]
print("colours[1]",x)
print()
y=len(colours)
print("length of array: ",y)
print()
print("looping in array:-")
for i in colours:
    print(i)
print()
print("appending in array")
colours.append(69)
print(colours)
print()
```

```
print("remove element")
colours.pop(2)
print(colours)
print()
print("_____
_____")
print()
```

OUTPUT:

```
ARRAY IN PYTHON

colours[1] 2

length of array:  5

looping in array:-
1
2
3
4
5

appending in array
array('i', [1, 2, 3, 4, 5, 69])

remove element
array('i', [1, 2, 4, 5, 69])
```

```
#1(b) list
print("LIST IN PYTHON")
print()
a=[2,5,1,9,4,0]
print(a)
print()
a=[2,5,1,9,4,0,2,6,4,4]
```

```
print(a)
print()
print("data type/ class")
print(type(a))
print()
b=[10,19,220]
print(b)
print("concatenation")
print(a+b)
print()
print("length of list")
print("length of a: ",len(a)," length of b: ",len(b))
print()
print("Sorting in list")
print(a)
print(a.sort())
print(b)
print(b.sort())
print()
print("_____
_____")
print()
```

OUTPUT:

```
LIST IN PYTHON

[2, 5, 1, 9, 4, 0]

data type/ class
<class 'list'>

[10, 19, 220]
concatenation
[2, 5, 1, 9, 4, 0, 10, 19, 220]

length of list
length of a:  6  length of b:  3

Sorting in list
[2, 5, 1, 9, 4, 0]
None
[10, 19, 220]
None
```

```
#1(c) set
print("SETS IN PYTHON")
print()
c={"data science","machine learning","deep learning"}
print("set: ",c)
print()
print("data type")
print(type(c))
print()
print("length of set")
print(len(c))
print()

print("_____
_____")
```

OUTPUT:

```
SETS IN PYTHON

set:  {'deep learning', 'data science', 'machine learning'}

data type
<class 'set'>

length of set
3
```

```
#1(d) dictionary
print("DICTIONARY IN PYTHON")
print()
d={41733001:"Abhigyan",41733002:"Guna Sekar",41733004:"Aditya Raj"}
print("dictionary: ",d)
print()
print("length of dictionary")
print(len(d))
print()
print("looping in array")
for i in d:
    print(i)
print()
print("getting values")
print(d.keys())
print()
print(d.values())
print()
print("reverse mapping")
e={v:k for k,v in d.items()}
print(e)
print()
```

```
print("_____
_____")
```

OUTPUT:

```
DICTIONARY IN PYTHON

dictionary:  {41733001: 'Abhigyan', 41733002: 'Guna Sekar', 41733004: 'Aditya Raj'}

length of dictionary
3

looping in array
41733001
41733002
41733004

getting values
dict_keys([41733001, 41733002, 41733004])

dict_values(['Abhigyan', 'Guna Sekar', 'Aditya Raj'])

reverse mapping
{'Abhigyan': 41733001, 'Guna Sekar': 41733002, 'Aditya Raj': 41733004}
```

```
#2(a) modules
from time import *
import math
print("MODULES IN PYTHON\n")
print("time module")
print("curr time: ",ctime(time()))
sleep(3)
print("slept for 3 seconds")
print()
print("Math module")
print("pi: ",math.pi)
print("sin: ",math.sin(0))

print("_____
_____")
```

OUTPUT:

```
MODULES IN PYTHON

time module
curr time:  Fri Jan 27 10:36:34 2023
slept for 1.5 seconds

Math module
pi:  3.141592653589793
sin:  0.0
```

#2(b) functions

```
print("FUNCTIONS IN PYTHON")
print()
print("abs()",abs(-5))
print("len()",len(d))
print("type()",type(d))
print()

print("_____
_____")
```

OUTPUT:

```
FUNCTIONS IN PYTHON

abs() 5
len() 3
type() <class 'dict'>
```

#3 File Handling

```
print("FILE HANDLING IN PYTHON")
print()
```

```
"""Twinkle, twinkle, little star,
How I wonder what you are!
Up above the world so high,
Like a diamond in the sky."""

with open("poem.txt","r+") as file:
    print("readline(): ",file.readline())
    print()
    print("readlines(): ",file.readlines())
    print()
    print("write(): ",file.write("Sathyabama University"))
    print()
    print("writelines(): ",file.writelines(["BE CSE Data Science","BE CSE AI ML","BE EEE"]))
    print()
    file.seek(0)
    print(file.readlines())
    print()

with open("binary.dat","wb+") as file:
    print("dump():  ",d)
    print()
    pk.dump(d,file)
    print()
    file.seek(0)
    print("load(): ",pk.load(file))

print("_____
_____")
```

OUTPUT:

FILE HANDLING IN PYTHON

readline(): Twinkle, twinkle, little star,

readlines(): ['How I wonder what you are!\n', 'Up above the world so high,\n', 'Like a diamond in the sky.']

write(): 22

writelines(): None

['Twinkle, twinkle, little star,\n', 'How I wonder what you are!\n', 'Up above the world so high,\n', 'Like a diamond in the sky.Sathyabama University BE CSE Data Science BE CSE AI ML BE EEE']

#4 Exception handling

#4(a)

```
try:
    numerator = 10
    denominator = 0

    result = numerator/denominator

    print(result)
except:
    print("Error: Denominator cannot be 0.")

print("_____
_____")

# Output: Error: Denominator cannot be 0.
```

#4(b)

```
try:
    with open("binary1.dat","rb+") as file:
        print("dump():  ",d)
        print()
        pk.dump(d,file)
        print("executed successfully")
        print()
```

```
except:
    print("wrong mode enabled")
    print()

print("_____
_____")
```

OUTPUT:

```
EXCEPTION HANDLING IN PYTHON

Error: Denominator cannot be 0.
wrong mode enabled
```

```
#5. inheritance
print("INHERITANCE IN PYTHON")
print()


class Person(object):

    def __init__(self, name, id):
            self.name = name
            self.id = id


    def Display(self):
            print(self.name, self.id)


emp = Person("Satyam", 102)
emp.Display()
```

```
print("_____
_____")
```

OUTPUT:

```
INHERITANCE IN PYTHON

Satyam 102
```