1.Write a Python program to convert JSON data to Python object.

```
import json
json_obj =  '{ "Name":"David", "Class":"I", "Age":6 }'
python_obj = json.loads(json_obj)
print("\nJSON data:")
print(python_obj)
print("\nName: ",python_obj["Name"])
print("Class: ",python_obj["Class"])
print("Age: ",python_obj["Age"])
```

2. Write a Python program to convert Python object to JSON data.

```
import json
python_obj = {
  "name": "David",
  "class":"I",
  "age": 6
}
print(type(python_obj))
j_data = json.dumps(python_obj)
print(j_data)
```

3. Write a Python program to convert Python objects into JSON strings. Print all the values.

```
import json
python_dict =  {"name": "David", "age": 6, "class":"I"}
python_list =  ["Red", "Green", "Black"]
python_str =  "Python Json"
python_int =  (1234)
python_float =  (21.34)
python_T =  (True)
```

```
python_F =  (False)
python_N =  (None)


json_dict = json.dumps(python_dict)
json_list = json.dumps(python_list)
json_str = json.dumps(python_str)
json_num1 = json.dumps(python_int)
json_num2 = json.dumps(python_float)
json_t = json.dumps(python_T)
json_f = json.dumps(python_F)
json_n = json.dumps(python_N)


print("json dict : ", json_dict)
print("jason list : ", json_list)
print("json string : ", json_str)
print("json number1 : ", json_num1)
print("json number2 : ", json_num2)
print("json true : ", json_t)
print("json false : ", json_f)
print("json null ; ", json_n)
```

4. Write a Python program to calculate the sum of a list of numbers.

```
def list_sum(num_List):
   if len(num_List) == 1:
      return num_List[0]
   else:
      return num_List[0] + list_sum(num_List[1:])


print(list_sum([2, 4, 5, 6, 7]))
```

5. Write a Python program to solve the Fibonacci sequence using recursion.

```
def fibonacci(n):
  if n == 1 or n == 2:
    return 1
  else:
    return (fibonacci(n - 1) + (fibonacci(n - 2)))


print(fibonacci(7))
```

6. Write a Python program to construct the following pattern, using a nested for loop.

```
n=5;
for i in range(n):
    for j in range(i):
        print ('* ', end="")
    print('')


for i in range(n,0,-1):
    for j in range(i):
        print('* ', end="")
    print('')
```

7.Write a Python program to print the alphabet pattern 'A'.

```
result_str="";
for row in range(0,7):
    for column in range(0,7):
        if (((column == 1 or column == 5) and row != 0) or ((row == 0 or row == 3) and (column > 1 and column < 5))):
            result_str=result_str+"*"
        else:
```

```
        result_str=result_str+" "
    result_str=result_str+"\n"
print(result_str);
```

8. Write a Python program to print the alphabet pattern 'D'.

```
result_str="";
for row in range(0,7):
    for column in range(0,7):
        if (column == 1 or ((row == 0 or row == 6) and (column > 1 and column < 5)) or (column == 5 and row != 0 and row != 6)):
            result_str=result_str+"*"
        else:
            result_str=result_str+" "
    result_str=result_str+"\n"
print(result_str);
```

9. Write a Python program to get the next day of a given date.

```
year = int(input("Input a year: "))
if (year % 400 == 0):
    leap_year = True
elif (year % 100 == 0):
    leap_year = False
elif (year % 4 == 0):
    leap_year = True
else:
    leap_year = False
month = int(input("Input a month [1-12]: "))
if month in (1, 3, 5, 7, 8, 10, 12):
    month_length = 31
elif month == 2:
    if leap_year:
```

```
        month_length = 29
    else:
        month_length = 28
else:
    month_length = 30


day = int(input("Input a day [1-31]: "))


if day < month_length:
    day += 1
else:
    day = 1
    if month == 12:
        month = 1
        year += 1
    else:
        month += 1
print("The next date is [yyyy-mm-dd] %d-%d-%d." % (year, month, day))
```

10. Write a Python program to create the multiplication table (from 1 to 10) of a number.

```
n = int(input("Input a number: "))
# use for loop to iterate 10 times
for i in range(1,11):
   print(n,'x',i,'=',n*i)
```

11. Write a Python program to construct the following pattern, using a nested loop number.

```
for i in range(10):
    print(str(i) * i)
```

Write a Python script to display the various Date Time formats.

a) Current date and time
b) Current year
c) Month of year
d) Week number of the year
e) Weekday of the week
f) Day of year
g) Day of the month
h) Day of week

```
import time
import datetime
print("Current date and time: " , datetime.datetime.now())
print("Current year: ", datetime.date.today().strftime("%Y"))
print("Month of year: ", datetime.date.today().strftime("%B"))
print("Week number of the year: ", datetime.date.today().strftime("%W"))
print("Weekday of the week: ", datetime.date.today().strftime("%w"))
print("Day of year: ", datetime.date.today().strftime("%j"))
print("Day of the month : ", datetime.date.today().strftime("%d"))
print("Day of week: ", datetime.date.today().strftime("%A"))
```

Write a Python program to determine whether a given year is a leap year.

```
def leap_year(y):
    if y % 400 == 0:
        return True
    if y % 100 == 0:
        return False
    if y % 4 == 0:
        return True
    else:
        return False
print(leap_year(1900))
```

```
print(leap_year(2004))
```

Write a Python program to convert a string to datetime.

```
from datetime import datetime
date_object = datetime.strptime('Jul 1 2014 2:43PM', '%b %d %Y %I:%M%p')
print(date_object)
```

Write a Python program to get the current time in Python.

```
import datetime
print(datetime.datetime.now().time())
```

Write a Python program to subtract five days from the current date.

```
from datetime import date, timedelta
dt = date.today() - timedelta(5)
print('Current Date :',date.today())
print('5 days before Current Date :',dt)
```

Write a Python program to print yesterday, today, tomorrow.

```
import datetime
today = datetime.date.today()
yesterday = today - datetime.timedelta(days = 1)
tomorrow = today + datetime.timedelta(days = 1)
print('Yesterday : ',yesterday)
print('Today : ',today)
print('Tomorrow : ',tomorrow)
```

Write a Python program to convert the date to datetime (midnight of the date) in Python.

```
from datetime import date

from datetime import datetime

dt = date.today()

print(datetime.combine(dt, datetime.min.time()))
```

Write a Python program to print the next 5 days starting today.

```
import datetime

base = datetime.datetime.today()

for x in range(0, 5):

    print(base + datetime.timedelta(days=x))
```