```
# 1. (i) Write a program to calculate area and circumference a circle whose radius is given by user.

print('\t**Program to calculate Area and Circumferernce of a circle**\n')
def circle():
  r=float(input('Enter the Radius : '))
  area = 3.14*r*r
  c = 2*3.14*r
  print('\n Area of circle : {}'.format(area))
  print(' circumference of circle : {}'.format(c))
circle()
```

        **Program to calculate Area and Circumferernce of a circle**

    Enter the Radius : 11

     Area of circle : 379.94
     circumference of circle : 69.08


```
# (ii) Write a program, to grade students based upon following GPA
        # A: GPA>=7.5; B: GPA between 7.5 and 6.0;
         # C: GPA between 6.0 and 4.0; Fail<4.0

print('\t *Grade of a Student*\n')
def grade():
  GPA=float(input('Enter the GPA of student : '))
  if (GPA>=7.5):
    print('\n\t A grade')
  elif (GPA<7.5 and GPA>=6.0):
    print('\n\t B grade')
  elif (GPA<6.0 and GPA>=4.0):
    print('\n\t C grade')
  else:
    print('\n\t *FAIL*')
grade()
```

  ⤷           *Grade of a Student*

    Enter the GPA of student : 8.0

            A grade


```
# 2. The record of a student (Name, Roll No., Marks in five subjects and percentage of marks) is stor
stdnt_Record = ['Alexa','A36', [56,98,99,72,69], 78.8]
# Write Python statements to retrieve the following information from the list stdnt_Record.
# a) Percentage of the student
# b) Marks in the fifth subject
# c) Roll no. of the student
# d) Change the name of the student from 'Alexa' to 'Emma'

stdnt_Record[3]               #.....a
```

    78.8

```
stdnt_Record[2][4]           #.....b
```

    69

```
stdnt_Record[1]              #       c
```

```
stdnt_Record[1]          #......c

    'A36'

stdnt_Record[0] ='Emma'      #.....d
stdnt_Record

    ['Emma', 'A36', [56, 98, 99, 72, 69], 78.8]


# 3. (i) Expand the expression (x+y)3

from sympy import symbols
from sympy import expand

x,y=symbols('x,y')

expand((x+y)**3)


    x**3 + 3*x**2*y + 3*x*y**2 + y**3


# (ii) Factorize the expression: x2+5x+6

from sympy import factor

factor(x**2+5*x+6)


    (x + 2)*(x + 3)


# (iii) Solve the simultaneous equations:
                # 2x+3y=6
                # 3x+2y=12

from sympy import solve

exp1=2*x+3*y-6
exp2=3*x+2*y-12

solve((exp1,exp2),dict=True)

    [{x: 24/5, y: -6/5}]


# 4. Define a function to convert one given currency to 5 different currencies of your choice.

def currency_converter():
  print('\t **Welcome to Currency Converter** ')
  ind=float(input('\nEnter amount in Indian Rupees : '))
  usd=ind*0.014
  bah=ind*0.0052
  kuw=ind*0.0042
  qat=ind*0.050
  sau=ind*0.052

  print('\n Amount in US Dollar     : {}'.format(usd))
  print(' Amount in Bahraini Dinar: {}'.format(bah))
  print(' Amount in Kuwaiti Dinar : {}'.format(kuw))
  print(' Amount in Qatari Riyal  : {}'.format(qat))
  print(' Amount in Saudi Riyal   : {}'.format(sau))
```

```
currency_converter()
print('\n\tThank You.')
```

```
# 5. The average rainfall in Hyderabad city in past 10 years.

print('\t\t\t **Line graph**\n')

import matplotlib.pyplot as plt
%matplotlib inline

plt.title('\nAverage rainfall in Hyderabad City in past 10 years')
plt.xlabel('\nYear')
plt.ylabel('Rainfall (mm)\n')
hyd_rainfall=[108,112,119,107,120,128,135,137,150,175]
year=[2011,2012,2013,2014,2015,2016,2017,2018,2019,2020]
plt.plot(year,hyd_rainfall,marker='o')
plt.legend(labels=['hyd_rainfall'])

print('"From this graph we can infer that rainfall in hyderabad have been increased rapidly."')
```
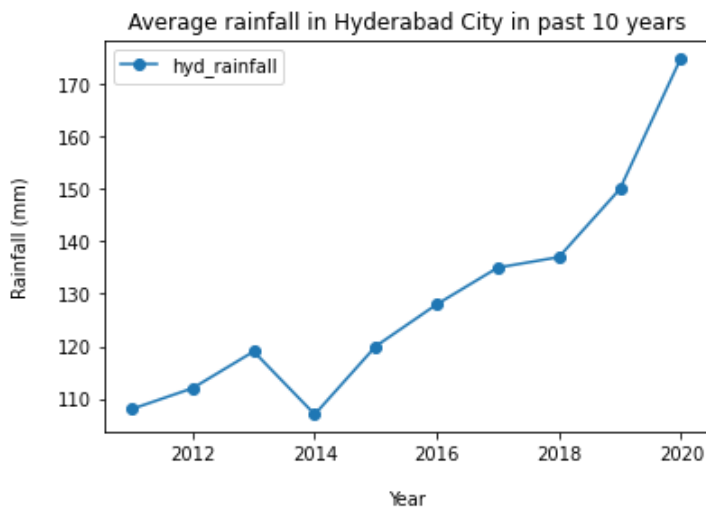
             **Line graph**

   "From this graph we can infer that rainfall in hyderabad have been increased rapidly."



```
print('\t\t\t **Bar graph**\n')

plt.bar(year,hyd_rainfall)

plt.title('\nAverage rainfall in Hyderabad City in past 10 years')
plt.xlabel('\nYear')
plt.ylabel('Rainfall (mm)\n')
```

```
hyd_rainfall=[108,112,119,107,120,128,135,137,150,175]
range=(2011,2020)
plt.legend(labels=['hyd_rainfall'])

print('"From this graph we can infer that rainfall in hyderabad have been increased rapidly."')
```

**Bar graph**

"From this graph we can infer that rainfall in hyderabad have been increased rapidly."