ASSIGNMENT 1: ELEMENTARY PROGRAMMING

1. Complete the code below:

In [ ]:
```
pi = 3.14159
diameter = 3

# Create a variable called 'radius' equal to half the diameter

# Calculate area of a circle

# Display result
```

In [1]:
```
pi = 3.14159
diameter = 3
radius = diameter/2
area = pi * (radius**2)
print (area)
```

```
7.0685775
```

2. Write a program to create a string holding the text below. After you construct your string, print it.

Then he said "I don't know."

In [3]:
```
a = "'I don't know'"
print ("Then he said", a)
```

```
Then he said 'I don't know'
```

3. Complete the code below:

```
a = "+"
b = "-"
c = a + b
# Create the 45-character string below, store it in a variable called s
# "+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+"

# print s and the length of s
print(s,"\n",len(s))
```

```
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
 45
```

In [7]:
```
a = "+"
b = "-"
c = a + b
s = c*22 + a
print (s, "\n", len(s))
```

```
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
 45
```

4. Suppose the cover price of ***a book is $24.95, but bookstores get a 40% discount. Shipping costs $3 for the first copy and 75 cents for each additional copy***. Write a program to find the total wholesale cost for ***60 copies.***

In [3]:
```
# q4
copy = 60
price = 24.95*0.6
cost = copy*price + 3 + 0.75*(copy-1)
print (cost)
```

```
945.4499999999999
```

In [3]:
```
while True:
    copy = eval(input("Enter copies of book: "))
    if copy > 0:
        price = 24.95*0.6
        cost = copy*price + 3 + 0.75*(copy-1)
        print (cost)
        break
    else:
        print ("Try again")
```

```
Enter copies of book: -50
Try again
Enter copies of book: 65
1024.05
```

5. If I ***leave my house at 06:52:00 am and run 1 mile at an easy pace (00:08:15 per mile), then 3 miles at tempo (00:07:12 per mile) and 1 mile at easy pace again, what time do I get home*** for breakfast? Write a program to solve this problem.

- *Đổi tất cả thời gian sang đơn vị giây, sau đó sử dụng phép tính để chuyển về dạng giờ : phút : giây.*

```
start = 6*3600 + 52*60
easy = 2*(8*60 + 15)
tempo = 3* (7*60 + 12)
home = start + easy + tempo #unit = sec.

hour = home // 3600
minute = (home - hour*3600)//60
second = (home - hour*3600 - minute*60)

print (f'Time get home: {hour}:{minute}:{second:02}')
```

```
Time get home: 7:30:06
```

6. Modify the following program to display the sales tax with two digits after the decimal point.

```
# Input purchase amount
purchaseAmount = eval(input("Enter purchase amount: "))
# Compute sales tax
tax = purchaseAmount * 0.06
print("Sales tax is", tax)
```

Cách 1: Sử dụng format string:

```
purchaseAmount = eval(input("Enter purchase amount: "))
tax = purchaseAmount * 0.06
print ('Sales tax is: %.2f'%tax)
```

```
Enter purchase amount: 5432.129873
Sales tax is: 325.93
```

Cách 2: Không sử dụng format string:

** Chuyển 2 chữ số ở phần thập phân lên phần nguyên bằng cách nhân thêm 100, sau đó ép kiểu số đó thành int (phần trước dấu thập phân), sau đó chia số đó lại cho 100, ta được số làm tròn.*

```
purchaseAmount = eval(input("Enter purchase amount: "))
tax = purchaseAmount * 0.06
print ("Sales tax is: ",int(tax*100)/100)
```

```
Enter purchase amount: 5432.129873
Sales tax is:  325.92
```

ASSIGNMENT 2: BUILT-IN FUNCTIONS

1. Write a program that asks the user to ***enter their age in years*** as input (assume that the user ***enters a positive integer***) and calculates and prints ***how old the user is in terms of days***. Assume that there are 365 days in a year.

For example: if the user enters 22
Sample Output → You are 8030 days old

```
age = eval(input("Enter your age: "))
print (f'You are {age*365} days old')
```

```
Enter your age: 22
You are 8030 days old
```

- ***Users enter any numbers they want, and then check if it is a positive interger, else allow them to enter again.***

```
while True:
    age = eval(input("Enter your age: "))
    if age == int(age) and age > 0:
        print (f'You are {age*365} days old')
        break
    else:
        print ("Please enter again")
```

```
Enter your age: -22
Please enter again
Enter your age: 22.3
Please enter again
Enter your age: 22
You are 8030 days old
```

2. Write a Python program to display the current date and time.
Sample Output: **Current date and time**
Tuesday, 23/10/2019, 13:15:20

```
#Q.2
import datetime
now = datetime.datetime.now()
print ("Current date and time:")
print (f'{now:%A, %d/%m/%Y, %H:%M:%S}')
```

```
Current date and time:
Sunday, 25/12/2022, 11:39:27
```

3. Write a Python program which accepts a list of comma-separated integer numbers from user and display length, sum of items in list.

```
#Q.3
list = eval(input("Enter list: "))
print (len(list), sum(list))
```

```
Enter list: [2, 4, 6]
3 12
```

4. Compose a program that writes five uniform random floats between 0 and 1, their average value, and their minimum and maximum value.

```
import random
r1 = random.uniform (1,10)
r2 = random.uniform (1,10)
r3 = random.uniform (1,10)
r4 = random.uniform (1,10)
r5 = random.uniform (1,10)
print (f'Five uniform random floats between 0 and 1 are: {r1,r2,r3,r4,r5}')
print (f'Their average is: {(r1+r2+r3+r4+r5)/5}')
print (f'Their maximum is: {max(r1,r2,r3,r4,r5)}')
print (f'Their minimum is: {min(r1,r2,r3,r4,r5)}')
```

```
Five uniform random floats between 0 and 1 are: (1.5996372906330227, 6.163852106851843, 7.149756223515922, 4.365304643545839, 7.624661563748494)
Their average is: 5.380642365659024
Their maximum is: 7.624661563748494
Their minimum is: 1.5996372906330227
```

EXERCISE 2: BUILT-IN FUNCTIONS AND MODULES

1. Show the printout of the following statements:

a. print('{0: 9.3f}'.format(57.467657))

b. print('{:>9.2f}'.format(5789.4))

c. print('{:*>25s}'.format("Programming is fun"))

```
print ('{0:09.3f}'.format(57.467657))
print ('{:>9.2f}'.format(5789.4))
print ('{:*>25s}'.format("Programming is fun"))
```

```
00057.468
  5789.40
*******Programming is fun
```

2. What are the results of the following statements?

a. s = 'How are you'
print('%.3s'%s)

b. x = 10
print('%#o'%x)

c. y = 125.68
print('%.2e'%y)

d. z = 3.14159
print('%06.2f'%(z))

```
# Q.2
s = "How are you"
print ('%.3s'%s)
z = 3.14159
print ('%06.2f'%z)
```

```
How
003.14
```

3. For each of the following variables, what is the type?.

a. y = input("What is your age?")

b. z = int(input("how many children do you have?"))

```
#Q.3
y = input("What is your age?")
print (type (y))
z = int(input("How many children do you have? "))
print (type (z))
```

```
What is your age?23
<class 'str'>
How many children do you have? 11
<class 'int'>
```

4. Write a program that asks the user to enter day, month, year and display date in format: dd/mm/yy.

```
#Q4
a = eval(input("Enter day: "))
b = eval(input("Enter month: "))
c = eval(input("Enter year: "))
print ('%02d/ %02d/ %02d'%(a,b,c%100))
```

```
Enter day: 12
Enter month: 12
Enter year: 2022
12/ 12/ 22
```

```
import calendar
cal = calendar.TextCalendar()
cal.pryear (2023)
```

```
                                  2023

      January                   February                  March
Mo Tu We Th Fr Sa Su      Mo Tu We Th Fr Sa Su      Mo Tu We Th Fr Sa Su
                   1             1  2  3  4  5             1  2  3  4  5
 2  3  4  5  6  7  8      6  7  8  9 10 11 12      6  7  8  9 10 11 12
 9 10 11 12 13 14 15     13 14 15 16 17 18 19     13 14 15 16 17 18 19
16 17 18 19 20 21 22     20 21 22 23 24 25 26     20 21 22 23 24 25 26
23 24 25 26 27 28 29     27 28                    27 28 29 30 31
30 31

      April                     May                       June
Mo Tu We Th Fr Sa Su      Mo Tu We Th Fr Sa Su      Mo Tu We Th Fr Sa Su
                1  2      1  2  3  4  5  6  7                1  2  3  4
 3  4  5  6  7  8  9      8  9 10 11 12 13 14      5  6  7  8  9 10 11
10 11 12 13 14 15 16     15 16 17 18 19 20 21     12 13 14 15 16 17 18
17 18 19 20 21 22 23     22 23 24 25 26 27 28     19 20 21 22 23 24 25
24 25 26 27 28 29 30     29 30 31                 26 27 28 29 30
31

       July                    August                  September
Mo Tu We Th Fr Sa Su      Mo Tu We Th Fr Sa Su      Mo Tu We Th Fr Sa Su
                1  2             1  2  3  4  5  6                1  2  3
 3  4  5  6  7  8  9      7  8  9 10 11 12 13      4  5  6  7  8  9 10
10 11 12 13 14 15 16     14 15 16 17 18 19 20     11 12 13 14 15 16 17
17 18 19 20 21 22 23     21 22 23 24 25 26 27     18 19 20 21 22 23 24
24 25 26 27 28 29 30     28 29 30 31              25 26 27 28 29 30
31

      October                   November                  December
Mo Tu We Th Fr Sa Su      Mo Tu We Th Fr Sa Su      Mo Tu We Th Fr Sa Su
                   1             1  2  3  4  5                1  2  3
 2  3  4  5  6  7  8      6  7  8  9 10 11 12      4  5  6  7  8  9 10
 9 10 11 12 13 14 15     13 14 15 16 17 18 19     11 12 13 14 15 16 17
16 17 18 19 20 21 22     20 21 22 23 24 25 26     18 19 20 21 22 23 24
23 24 25 26 27 28 29     27 28 29 30              25 26 27 28 29 30 31
30 31
```

In [104]:

```
import calendar
cal = calendar.TextCalendar(firstweekday= 3) #6: chủ nhật, 0: thứ hai
cal.pryear (2022)
```

```
                                  2022

      January                   February                  March
Th Fr Sa Su Mo Tu We      Th Fr Sa Su Mo Tu We      Th Fr Sa Su Mo Tu We
       1  2  3  4  5                   1  2                      1  2
 6  7  8  9 10 11 12      3  4  5  6  7  8  9      3  4  5  6  7  8  9
13 14 15 16 17 18 19     10 11 12 13 14 15 16     10 11 12 13 14 15 16
20 21 22 23 24 25 26     17 18 19 20 21 22 23     17 18 19 20 21 22 23
27 28 29 30 31           24 25 26 27 28           24 25 26 27 28 29 30
                                                  31

      April                     May                       June
Th Fr Sa Su Mo Tu We      Th Fr Sa Su Mo Tu We      Th Fr Sa Su Mo Tu We
    1  2  3  4  5  6                1  2  3  4                         1
 7  8  9 10 11 12 13      5  6  7  8  9 10 11      2  3  4  5  6  7  8
14 15 16 17 18 19 20     12 13 14 15 16 17 18      9 10 11 12 13 14 15
21 22 23 24 25 26 27     19 20 21 22 23 24 25     16 17 18 19 20 21 22
28 29 30                 26 27 28 29 30 31        23 24 25 26 27 28 29
                                                  30

       July                    August                  September
Th Fr Sa Su Mo Tu We      Th Fr Sa Su Mo Tu We      Th Fr Sa Su Mo Tu We
    1  2  3  4  5  6                   1  2  3      1  2  3  4  5  6  7
 7  8  9 10 11 12 13      4  5  6  7  8  9 10      8  9 10 11 12 13 14
14 15 16 17 18 19 20     11 12 13 14 15 16 17     15 16 17 18 19 20 21
21 22 23 24 25 26 27     18 19 20 21 22 23 24     22 23 24 25 26 27 28
28 29 30 31              25 26 27 28 29 30 31     29 30

      October                   November                  December
Th Fr Sa Su Mo Tu We      Th Fr Sa Su Mo Tu We      Th Fr Sa Su Mo Tu We
       1  2  3  4  5                   1  2      1  2  3  4  5  6  7
 6  7  8  9 10 11 12      3  4  5  6  7  8  9      8  9 10 11 12 13 14
13 14 15 16 17 18 19     10 11 12 13 14 15 16     15 16 17 18 19 20 21
20 21 22 23 24 25 26     17 18 19 20 21 22 23     22 23 24 25 26 27 28
27 28 29 30 31           24 25 26 27 28 29 30     29 30 31
```

```
import calendar
cal = calendar.TextCalendar(firstweekday= 3) #6: chủ nhật, 0: thứ hai
cal.prmonth (2022,11)
```

```
   November 2022
Th Fr Sa Su Mo Tu We
                   1  2
 3  4  5  6  7  8  9
10 11 12 13 14 15 16
17 18 19 20 21 22 23
24 25 26 27 28 29 30
```

In [112]:

```
calendar.isleap(2016) #Hàm kiểm tra năm nhuận

```

Out[112]: True

```
import calendar
cal = calendar.LocaleTextCalendar(5, "VIETNAMESE")
cal.pryear (2023)
```

```
                                  2023

     Thaùng Gieâng             Thaùng Hai                Thaùng Ba
T7 CN T2 T3 T4 T5 T6      T7 CN T2 T3 T4 T5 T6      T7 CN T2 T3 T4 T5 T6
    1  2  3  4  5  6                1  2  3                   1  2  3
 7  8  9 10 11 12 13      4  5  6  7  8  9 10      4  5  6  7  8  9 10
14 15 16 17 18 19 20     11 12 13 14 15 16 17     11 12 13 14 15 16 17
21 22 23 24 25 26 27     18 19 20 21 22 23 24     18 19 20 21 22 23 24
28 29 30 31              25 26 27 28              25 26 27 28 29 30 31

     Thaùng Tyù                Thaùng Naêm               Thaùng Saùu
T7 CN T2 T3 T4 T5 T6      T7 CN T2 T3 T4 T5 T6      T7 CN T2 T3 T4 T5 T6
 1  2  3  4  5  6  7             1  2  3  4  5                1  2
 8  9 10 11 12 13 14      6  7  8  9 10 11 12      3  4  5  6  7  8  9
15 16 17 18 19 20 21     13 14 15 16 17 18 19     10 11 12 13 14 15 16
22 23 24 25 26 27 28     20 21 22 23 24 25 26     17 18 19 20 21 22 23
29 30                    27 28 29 30 31           24 25 26 27 28 29 30

     Thaùng BaÛy               Thaùng Taùm               Thaùng Chiùn
T7 CN T2 T3 T4 T5 T6      T7 CN T2 T3 T4 T5 T6      T7 CN T2 T3 T4 T5 T6
 1  2  3  4  5  6  7                1  2  3  4                   1
 8  9 10 11 12 13 14      5  6  7  8  9 10 11      2  3  4  5  6  7  8
15 16 17 18 19 20 21     12 13 14 15 16 17 18      9 10 11 12 13 14 15
22 23 24 25 26 27 28     19 20 21 22 23 24 25     16 17 18 19 20 21 22
29 30 31                 26 27 28 29 30 31        23 24 25 26 27 28 29
                                                  30

     Thaùng Möôøi              Thaùng Möôøi Moät          Thaùng Möôøi Hai
T7 CN T2 T3 T4 T5 T6      T7 CN T2 T3 T4 T5 T6      T7 CN T2 T3 T4 T5 T6
    1  2  3  4  5  6                1  2  3                   1
 7  8  9 10 11 12 13      4  5  6  7  8  9 10      2  3  4  5  6  7  8
14 15 16 17 18 19 20     11 12 13 14 15 16 17      9 10 11 12 13 14 15
21 22 23 24 25 26 27     18 19 20 21 22 23 24     16 17 18 19 20 21 22
28 29 30 31              25 26 27 28 29 30        23 24 25 26 27 28 29
                                                  30 31
```

EXERCISE 3: CONTROL FLOW STATEMENTS

1. Suppose that when you run the following program you enter the input 2, 3, 6 from the console. What is the output?

```
x, y, z = eval(input("Enter three numbers: "))
print("sorted" if x < y and y < z else "not sorted")
```

Forecast: x = 2, y = 3, z = 6. Result: sorted.

```
1 x, y, z = eval(input("Enter three numbers: "))
2 print("sorted" if x < y and y < z else "not sorted")
```

```
Enter three numbers: 2,3,6
sorted
```

2. Rewrite the following **if** statements using **conditional expressions:**

```
ages = 15
if ages >= 16:
    ticketPrice = 20
else:
    ticketPrice = 10
print(ticketPrice)
```

```
count = 20
if count % 10 == 0:
    print(count)
else:
    print(count, end = " ")
print("Done")
```

```
1 ages = 15
2 if ages >= 16:
3     ticketPrice = 20
4 else:
5     ticketPrice = 10
6 print (ticketPrice)
```

```
10
```

```
1 ages = 15
2 ticketPrice = 20 if ages >= 16 else 10
3 print (ticketPrice)
```

```
10
```

```
1 count = 20
2 if count % 10 == 0:
3     print (count)
4 else:
5     print (count, end = " ")
6 print ("Done")
```

```
20
Done
```

```
1 count = 20
2 print (count, end = "\n" if count %10 == 0 else " ")
3 print ("Done")
```

```
20
Done
```

3. Rewrite the following conditional expressions using **if/else** statements:

a. score = 3*scale if x > 10 else 4*scale

```
1 scale = 10
2 x = 5
3 if x > 10:
4     n = 3*scale
5 else:
6     n = 4*scale
7 print (n)
```

```
40
```

b. print(i if number % 3 == 0 else j)

```
1 i, j = 1, 2
2 number = 3
3 if number % 3 == 0:
4     print (i)
5 else:
6     print (j)
```

```
1
```

4. Given different scored marks of students. We need to find grades. The final grade will be out of 100%. The grading breakdown is listed below:

Weekly Homework:	20%
Quizzes:	10%
Assignments :	20%
Final Exam:	50%

Grade will be calculated according to:

1. score >= 9.0 : "A+"
2. 8.5 <= score < 9.0 : "A"
3. 8.0 <= score < 8.5 : "B+"
4. 7.0 <= score < 8.0 : "B"
5. 6.5 <= score < 7.0 : "C+"
6. 6.0 <= score < 6.5 : "C"
7. 5.0 <= score < 6.0 : "D+"
8. 4.0 <= score < 5.0 : "D"

```
while True:
    weeklyHomework = eval(input("Enter weekly Homework: "))
    quiz = eval(input("Enter quiz: "))
    assignment = eval(input("Enter assignment: "))
    final = eval(input("Enter final exam: "))
    if weeklyHomework<0 or weeklyHomework>10 or quiz<0 or quiz>10 or assignment<0 or assignment>10 or final<0 or final>10:
        print("Enter again")
    else:
        score = weeklyHomework*0.2 + quiz*0.1 + assignment*0.2 + final*0.5
        if score >= 9.0:
            print ("A+")
        elif score >= 8.5:
            print ("A")
        elif score >= 8.0:
            print ("B+")
        elif score >= 7.0:
            print ("B")
        elif score >= 6.5:
            print ("C+")
        elif score >= 6.0:
            print ("C")
        elif score >= 5.0:
            print ("D+")
        elif score >= 4.0:
            print ("D")
        else:
            print ("F")
        break
```

```
Enter weekly Homework: -2
Enter quiz: 5
Enter assignment: 4.6
Enter final exam: 5
Enter again
Enter weekly Homework: 5
Enter quiz: 11
Enter assignment: 5
Enter final exam: 6
Enter again
Enter weekly Homework: 2
Enter quiz: 5
Enter assignment: 6
Enter final exam: 9
C+
```

5. Write a program that lets the user enter a year and then determines whether it is a leap year. **All leap years are divisible by four**, but **multiples of 100 are not leap years unless** they are also **a multiple of 400.**

For example: 2016 was a leap year, but 1900 was not, 2000 was a leap year, as it is a multiple of 400, but 2100 will not be a leap year.

```
while True:
    year = eval(input("Enter a year: "))
    if year < 0 or year != int(year):
        print ("Enter again")
    else:
        if year%4 == 0 and year%100 != 0 or year%400 ==0:
            print (f'{year} is a leap year')
        else:
            print (f'{year} is not a leap year')
        break
```

```
Enter a year: 2016
2016 is a leap year
```

```
Enter a year: 1900
1900 is not a leap year
```

6. Develop a program to play a lottery. The program randomly generates **a two-digit number**, prompts the user to enter a two-digit number, and determines whether the user wins according to the following rules:

a. If the user's input matches the lottery in the exact order, the award is $10,000. ***(So sánh ==)***

b. If all the digits in the user's input match all the digits in the lottery number, the award is $3,000.

+ Nếu chữ số thứ nhất trùng chữ số thứ 2, chữ số thứ 2 trùng chữ số thứ nhất thì trúng $3000.

c. If one digit in the user's input matches a digit in the lottery number, the award is $1,000.

+ Nếu chữ số thứ 1 trùng chứ số thứ 1 hoặc 2, hay chữ số thứ 2 trùng chữ số thứ 2 hoặc 1, thì trúng $1000.

- ***Cần lấy chữ số thứ 1, 2 từ số random và từ số của người dùng nhập vào đem đi so sánh.***

```
guess = eval(input("Enter a number: "))
from random import randint
rand = randint (11,99)
rand1, rand2 = rand//10, rand%10
guess1, guess2 = guess//10, guess%10
if guess == rand:
    print ("You win $10,000")
elif guess1 == rand2 or guess2 == rand1:
    print ("You win $3,000")
elif guess1 == rand2 or guess1 == rand1 or guess2 == rand2 or guess2 == rand1:
    print ("You win $1,000")
else:
    print ("Better luck next time!")
```

```
Enter a number: 20
You win $3,000
```

7. Write a program that lets user enter a integer number N and **calculate the sum of <u>EVEN</u> numbers from 0 to N-1.**

```
n = eval(input("Enter a number: "))
s = 0
for i in range (0,n,2):
    s += i
print (s)
```

```
Enter a number: 12
30
```

8. Create a simple guessing game. Program generates a **<u>random integer number between 1 and 50.</u>** The program prompts the user to ***enter numbers continuously until it matches the randomly generated number.*** For each user input, ***the program reports whether it is too low or too high, so the user can choose the next input intelligently.***

```
from random import randint
r = randint(1,50)
while True:
    n = eval(input("Enter number: "))
    if n < r:
        print ("You have to enter higher")
    elif n > r:
        print ("You have to enter lower")
    else:
        print ("You got it")
        break
```

```
Enter number: 20
You have to enter lower
Enter number: 50
You have to enter lower
Enter number: 10
You have to enter lower
Enter number: 5
You have to enter lower
Enter number: 1
You have to enter higher
Enter number: 2
You have to enter higher
Enter number: 3
You have to enter higher
Enter number: 5
You have to enter lower
Enter number: 4
You got it
```

9. Find all divisors of **a <u>natural</u> number.**

Example:
N = 20 → Divisors of N: 1, 2, 4, 5, 10, 20 → **<u>Cặp ước đối ứng:</u>** 1,20; 2,10; 4,5 (khi 2 số trong 1 cặp nhân với nhau thì ra N).
Ta có: Ước i = 1 → N/i = 20; Ước i = 2 → N/i = 10; Ước i = 4 → N/i = 5
→ **i ≤ N/i** → i * i ≤ N → **i ≤ sqrt (N)**

+ Nếu N = 100 → Ước i = 10 thì N/i = 10 → Để tránh số 10 in 2 lần thì ta phải xét điều kiện:
Nếu n//i == i (Giả sử xét n = 100 thì như trên) → Chỉ in ước i = 10 thôi.
Các trường hợp còn lại **n//i != i nên ta cần in cả i và n/i. (Theo phần ước đối ứng phía trên).**

```
from math import sqrt
n = eval(input("Enter a number: "))
canBac = int(sqrt (n)) #đã chứng minh
for i in range (1, canBac + 1):
    if n%i == 0:
        if n//i == i:
            print (i, end= " ")
        else:
            print (i, n//i, end = " ")
```

```
Enter a number: 100
1 100 2 50 4 25 5 20 10
```

10. Write a program that lets user enter a integer number N and display:

a. A box like one below:

```
Enter a number: 5
* * * * *
* * * * *
* * * * *
* * * * *
* * * * *
```

```
Enter a number: 5
* * * * *
*       *
*       *
*       *
* * * * *
```

```
n = eval (input("Enter a number: "))
for i in range (1, n+1): #không cần điều kiện i <= n vì bản thân range đã có
    print (n*"* ")
```

```
Enter a number: 5
* * * * *
* * * * *
* * * * *
* * * * *
* * * * *
```

```
n = eval (input("Enter a number: "))
print (n*"* ")
for i in range (1, n-1):
    print ("* "+(n-2)*"  "+"*")
print (n*"* ")
```

```
Enter a number: 5
* * * * *
*       *
*       *
*       *
* * * * *
```

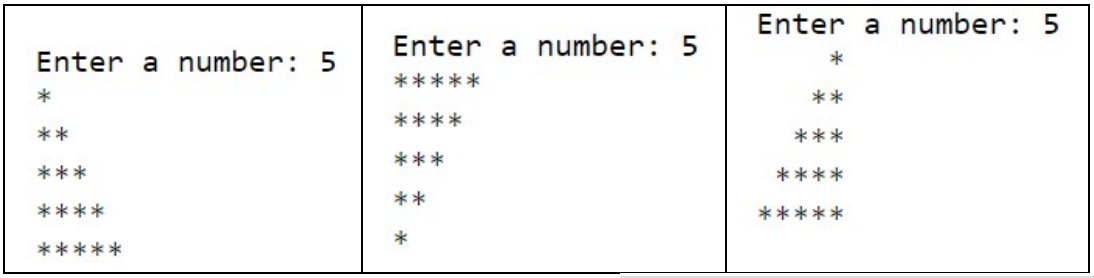
```
n = eval (input("Enter a number: "))
for i in range (n):
    for j in range (n):
        print ("*", end = " ") #in ngang các dấu sao
    print () #xuống dòng
```

```
Enter a number: 5
* * * * *
* * * * *
* * * * *
* * * * *
* * * * *
```

```
n = eval (input("Enter a number: "))
for i in range (1, n+1):
    if i == 1 or i == n:
        print (n*"* ")
    else:
        print ("*"+(2*n-3)*" "+"*")
```

```
Enter a number: 5
* * * * *
*       *
*       *
*       *
* * * * *
```

b. A triangle like one below:




```
n = eval (input("Enter a number: "))
for i in range (1, n+1):
    print (i*"*")
```

```
Enter a number: 5
*
**
***
****
*****
```

```
n = eval (input("Enter a number: "))
for i in range (n, 0,-1):
        print (i*"*")
```

```
Enter a number: 5
*****
****
***
**
*
```

```
n = eval (input("Enter a number: "))
for i in range (n, 0,-1):
    print ((i-1)*" "+(n-(i-1))*"*")
```

```
Enter a number: 5
    *
   **
  ***
 ****
*****
```

```
n = eval (input("Enter a number: "))
for i in range (1, n+1):
    print ((n-i)*" "+i*"*")
```

```
Enter a number: 5
    *
   **
  ***
 ****
*****
```

```
Enter a number: 5
      *
     ***
    *****
   *******
  *********
```

c. A triangle like one below:

```
n = eval (input("Enter a number: "))
for i in range (n, 0,-1):
    if i == n:
        print ((((i*2)//2)-1)*" "+((n-i+1))*"*"+(((i*2)//2)-1)*" ")
    elif i < n:
        print ((((i*2)//2)-1)*" "+((((n-i))*2)+1)*"*"+(((i*2)//2)-1)*" ")
```

```
Enter a number: 5
    *
   ***
  *****
 *******
*********
```

```
n = eval (input("Enter a number: "))
for i in range (1, n+1):
    print (((n-i)*" "+(2*i-1)*"*"))
```

```
Enter a number: 7
      *
     ***
    *****
   *******
  *********
 ***********
*************
```

```
Enter a number: 5
1 2 3 4 5
1 2 3 4
1 2 3
1 2
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
```

d. Shape “K” like one below:

```python
n = eval(input("Enter a number: "))
for i in range (n,0,-1): #Chạy  theo hàng
    for j in range (1, i+1): #Chạy theo cột, cho j chạy theo i
        print (j, end = " ")
    print ()
for i in range (2,n+1): #Chạy  theo hàng - chạy 4 hàng cuối -> i chạy từ 2
    for j in range (1, i+1): #Chạy theo cột, cho j chạy theo i
        print (j, end = " ")
    print ()
```

```
Enter a number: 5
1 2 3 4 5
1 2 3 4
1 2 3
1 2
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
```

ASSIGNMENT 3: CONTROL FLOW STATEMENTS

1. Write a program to find out the Chinese zodiac sign for a given year. The Chinese zodiac sign is based on a 12-year cycle, and each year in this cycle is represented by an animal — ***monkey, rooster, dog, pig, rat, ox, tiger, rabbit, dragon, snake, horse, and sheep.***

For example, year = 2019 → *Sample Output*: pig

Hint: Year % 12 == i, với i = 0, 1, …, 11 *tương ứng với thứ tự các con vật phía trên.*

```python
year = eval(input("Enter a year: "))
soDu = year%12
if soDu == 0:
    print ("Monkey")
elif soDu == 1:
    print ("Rooster")
elif soDu == 2:
    print ("Dog")
elif soDu == 3:
    print ("Pig")
elif soDu == 4:
    print ("Rat")
elif soDu == 5:
    print ("Ox")
elif soDu == 6:
    print ("Tiger")
elif soDu == 7:
    print ("Rabbit")
elif soDu == 8:
    print ("Dragon")
elif soDu == 9:
    print ("Snake")
elif soDu == 10:
    print ("Horse")
elif soDu == 11:
    print ("Sheep")
else:
    print ("Invalid data!")
```

```
Enter a year: 2019
Pig
```

2. Write a program to **display all odd (Số lẻ) numbers between** a and b.

Cách 1: Thông thường:

```python
a = eval (input("Enter number a: "))
b = eval (input("Enter number b: "))
if a > b:
    print ("We will swap a and b")
    a, b = b, a
for i in range (a+1,b): #Between a and b
    if i%2 != 0:
        print (i, end = " ")
```

```
Enter number a: 10
Enter number b: 50
11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49
```

Cách 2: Tối ưu hơn:

```python
#Cách 2: Cách tối ưu - Chạy nhanh hơn
while True:
    a = eval(input("Enter a: "))
    b = eval(input("Enter b: "))
    if a >= b:
        print ("a must be greater than b")
    else:
        break #điều kiện đúng -> stop loop
#Xác định a là số chẵn hay số lẻ
if a%2 == 0:
    j = a + 1 #Trường hợp a là số chẵn
else:
    j = a + 2 #Trường hợp a là số lẻ
for i in range (j,b,2):
        print (i, end = " ")
```

```
Enter a: 32
Enter b: 55
33 35 37 39 41 43 45 47 49 51 53
```

3. Write a program to create a simple calculator that can add, subtract, multiply or divide depending upon the input from the user.

```
1.Add
2.Subtract
3.Multiply
4.Divide
Please choose operations (1,2,3,4):5
Your choice is invalid
Please choose operations (1,2,3,4):3
Enter two numbers: 2,3
2 * 3 = 6
Do you want to continue (Y/N)?Y
Please choose operations (1,2,3,4):1
Enter two numbers: 3,4
3 + 4 = 7
Do you want to continue (Y/N)?N
```

```python
# Print menu
q = 'Y'
while q == 'Y':
    c = int(input("Please choose operations (1,2,3,4):"))
    # check user's choice is valid or invalid?
    # if choice is invalid, ask user to re-enter other choice
    # if choice is valid, prompt user to input two numbers
    # Use "if" statement to execute operations
    q = input("Do you want to continue (Y/N)?")
```

Cách 1: Không theo thứ tự đề yêu cầu:

```python
print ("1. Add\n2. Subtract\n3. Multiply\n4. Divide")
q = "Y"
while q == "Y":
    c = int (input("Please choose operations (1,2,3,4): "))
    if c == 1:
        a, b = eval(input("Enter two numbers: "))
        print (f'{a} + {b} = {a+b}')
    elif c == 2:
        a, b = eval(input("Enter two numbers: "))
        print (f'{a} - {b} = {a-b}')
    elif c == 3:
        a, b = eval(input("Enter two numbers: "))
        print (f'{a} * {b} = {a*b}')
    elif c == 4:
        while True:
            a, b = eval(input("Enter two numbers: "))
            if b != 0:
                print (f'{a} / {b} = {a/b}')
                break
            else:
                print ("Error equation!")
    else:
        print ("Your choice is invalid!")
    q = input ("Do you want to continue (Y/N)? ")
```

```
1. Add
2. Subtract
3. Multiply
4. Divide
Please choose operations (1,2,3,4): 4
Enter two numbers: 1,0
Error equation!
Enter two numbers: 1,5
1 / 5 = 0.2
Do you want to continue (Y/N)? Y
Please choose operations (1,2,3,4): 1
Enter two numbers: 2,5
2 + 5 = 7
Do you want to continue (Y/N)? N
```

Cách 2: Theo thứ tự đề yêu cầu:

```python
print ("1. Add\n2. Subtract\n3. Multiply\n4. Divide")
q = "Y"
while q == "Y":
    c = int (input("Please choose operations (1,2,3,4): "))
    if c<1 or c>4 or round(c,0)!= c: # loại trường hợp users nhập c không là số nguyên, vd 1.1
        print ("Your choice is invalid!")
    elif c == 1:
        a, b = eval(input("Enter two numbers: "))
        print (f'{a} + {b} = {a+b}')
    elif c == 2:
        a, b = eval(input("Enter two numbers: "))
        print (f'{a} - {b} = {a-b}')
    elif c == 3:
        a, b = eval(input("Enter two numbers: "))
        print (f'{a} * {b} = {a*b}')
    else:
        while True:
            a, b = eval(input("Enter two numbers: "))
            if b != 0:
                print (f'{a} / {b} = {a/b}')
                break
            else:
                print ("Error equation!")
    q = input ("Do you want to continue (Y/N)? ")
```

```
1. Add
2. Subtract
3. Multiply
4. Divide
Please choose operations (1,2,3,4): 4
Enter two numbers: 2,0
Error equation!
Enter two numbers: 1,2
1 / 2 = 0.5
Do you want to continue (Y/N)? Y
Please choose operations (1,2,3,4): 5
Your choice is invalid!
Do you want to continue (Y/N)? N
```

EXERCISE 4: DEFINING FUNCTIONS

1. Write a **compare function** that **returns 1 if a > b, 0 if a == b, and -1 if a < b.**

```
def compare (a,b):
    if a>b:
        return 1
    elif a == b:
        return 0
    else:
        return -1
a = eval(input("Enter a: "))
b = eval(input("Enter b: "))
print (compare(a,b))
```

```
Enter a: 1
Enter b: 5
-1
```

2. Write a program that contains two functions:

- **a.** Calculate area of rectangle *(hình chữ nhật)* ***(Lưu ý kiểm tra điều kiện của các độ dài luôn > 0)***
- **b.** Calculate area of circle

+ Hướng dẫn: (Cách mở rộng)

```
#Q.5
# Calculate area of rectangle
def areaOfRec(length,width):
    while True:
        length,width = eval(input("Enter length and width of a rectangle: "))
        if length < 0 or width < 0:
            print ("Invalid value, please enter again!")
            return -1
        else:
            area1 = length*width
            return area1
# Khi lập trình, cả 2 nhánh : 1 là cả 2 phải có return, 2 là cả 2 cùng không có return, không nên 1 hàm có, 1 hàm không
# Calculate area of circle
import math
def areaOfCircle(radius):
    while True:
        radius = eval(input("Enter radius of a circle: "))
        if radius < 0:
            print ("Invalid value, please enter again!")
            return -1
        else:
            area2 = radius*radius*math.pi
            return round(area2,3)
# Input:
print (areaOfRec(a,b))
print (areaOfCircle(radius))
```

```
Enter length and width of a rectangle: 12,4
48
Enter radius of a circle: 12.4
483.051
```

```python
#Q.5
# Calculate area of rectangle
def areaOfRec(length,width):
    if length < 0 or width < 0:
        print ("Invalid value")
        return -1
    else:
        area1 = length*width
        return area1
# Calculate area of circle
import math
def areaOfCircle(radius):
    if radius < 0:
        print ("Invalid value")
        return -1
    else:
        area2 = radius*radius*math.pi
        return area2
# Input:
print (f'Area of rectangle is: {areaOfRec(3,4)}')
print (f'Area of circle is: {areaOfCircle(21.2):.3f}')
```

```
Area of rectangle is: 12
Area of circle is: 1411.957
```

```python
#Calculate area of rectangle:
def areaOfRec (a,b):
    while True:
        if a<0 or b<0:
            print ("Enter again")
        else:
            area = a*b
            return print ("Area of rectangle is ", area)
#Calculate area of circle:
def areaOfCircle (r):
    from math import pi
    while True:
        if r<0:
            print ("Enter again")
        else:
            area1 = pi*r*r
            return print (f"Area of circle is {area1:.2f}")
a,b=eval(input("Enter 2 sides of rectangle: "))
areaOfRec(a,b)
r=eval(input("Enter radius of circle: "))
areaOfCircle(r)
```

```
Enter 2 sides of rectangle: 2,4
Area of rectangle is  8
Enter radius of circle: 12
Area of circle is 452.39
```

3. Write a function to reverse digits of a number. **(NC)**

```python
#Q.6 Write a function to reverse digits of a number
def reverse (a):
    i = a
    while i !=0:
        d = i%10
        print (d, end="")
        i = i // 10
a = eval(input("Enter a number: "))
reverse (a)
# Về mặt hình thức nó đúng, nhưng bản chất nó chưa đúng, vì trả kết quả là trả từng chữ số 1
```

```
Enter a number: 123
321
```

```
123
3
2
1
rev =(3*10 + 2)*10 + 1 = 321
```

In [22]:

```python
def reverse (a):
    rev = 0
    while a > 0:
        i = a%10
        a = a // 10
        rev = (rev*10) + i
    return rev
a = eval(input("Enter a number: "))
reverse (a)
```

```
Enter a number: 1243
```

Out[22]: 3421

4. Write a function to show greeting based on current time:

- Good morning (0 – 11:59)
- Good afternoon (12 – 15:59)
- Good evening (16 - 20:59)
- Good night (21 – 23:59)

Cách 1: Sử dụng thư viện datetime

```
# Q.7 - Ex4 - Chap8
def greeting():
    import datetime
    hour = datetime.datetime.now().hour #Lấy giờ hiện hành theo kiểu int
    minute = datetime.datetime.now().minute # Lấy phút hiện hành theo kiểu int
    now = datetime.datetime.now()
    print (f'Current date and time: {now:%A, %d/%m/%y, %H:%M:%S}')
    if hour >=0 and hour <=11 and minute <=59:
        print ("Good morning!")
    elif hour >= 12 and hour <= 15 and minute <= 59:
        print ("Good afternoon!")
    elif hour >= 16 and hour <= 20 and minute <= 59:
        print ("Good evening!")
    else:
        print ("Good night")
greeting()
```

```
Current date and time: Monday, 12/12/22, 14:12:14
Good afternoon!
```

Cách 2: Sử dụng thư viện time

In [15]:

```
def currenttime(n):
    if n<0 or n>=24:
        print('Invalid data')
    elif n<12:
        print('Good morning')
    elif n<16:
        print('Good afternoon')
    elif n<21:
        print('Good evening')
    else:
        print('Good night')

import time
n = time.localtime()
currenttime(n.tm_hour)
```

```
Good night
```

ASSIGNMENT 4: DEFINING FUNCTIONS

1. Write a program that contains the following two functions and test them:

```
#check whether three sides of a triangle are valid?
def isValid(side1, side2, side3):
    # return True if three sides of a triangle are valid?
    # otherwise return False

#Calculate area of a triangle
def area(side1, side2, side3):
    # Call function isValid() to check inputs
    # compute area if inputs are valid
    # otherwise, displays that the "inputs are invalid"

# Enter three sides and call func area()
```

Sample Output 1:
Enter three sides: 1, 3, 1
Inputs are invalid

Sample Output 2:
Enter three sides: 1, 1, 1
The area of the triangle is 0.43

In [1]:
```
#Check whether three sides of a triangle are valid
def isValid(side1, side2, side3):
    if side1 < 0 or side2 < 0 or side3 < 0:
        return False
    elif (side1+side2)<=side3 or (side1+side3)<=side2 or (side2+side3)<=side1:
        return False
    return True #Trường hợp mặc định

#Calculate area of a triangle:
from math import sqrt
def area(side1, side2, side3):
    if (isValid(side1,side2,side3)) == False: #Lời gọi hàm trong điều kiện
    # Tương tự câu trên: if (isValid(side1,side2,side3)) == True
    # if (isValid(side1,side2,side3)) == False
    # Tương tự câu trên: if (!isValid(side1,side2,side3))
        print ('Inputs are invalid')
        return -1
    else:
        p = (side1+side2+side3)/2
        area = sqrt(p*(p-side1)*(p-side2)*(p-side3))
        return print (f"Area of triangle is: {area:.3f}")
side1, side2, side3 = eval(input("Please enter 3 sides of a rectangle: "))
area(side1, side2, side3)
```

```
Please enter 3 sides of a rectangle: 2,3,4
Area of triangle is: 2.905
```

2. Write a function that takes an integer n and returns a random integer with exactly n digits.
Sample Output: ndigit random(2) → 34, ndigit_random(3) →345, ndigit_random(4) → 4567

In [15]:
```
from random import randrange
def ndigit_random (n):
    return randrange (10**(n-1),10**n)
n = eval(input("Enter n: "))
print (ndigit_random (n))
```

```
Enter n: 12
680585819331
```

3. Write a function **even_digits**(n) that counts the number of even digits in n.

Sample Output:
even_digits(1234) → 2 , even_digits(1357) → 0

Một số được gọi là "chẵn" nếu nó là một bội nguyên của 2. Ví dụ, 10 là một số chẵn vì nó bằng 5 × 2. Tương tự như vậy, 0 là một bội nguyên của 2, cụ thể là 0 × 2, ***vì vậy 0 là số chẵn.***

```
def even_digits(n):
    count = 0
    while n != 0:
        i = n % 10
        n = n// 10
        if i % 2 == 0:
            count += 1
    return count
n = eval(input("Enter a number: "))
print (even_digits(n))
```

```
Enter a number: 12230
3
```

4. Write a function called **number_of_divisors** that takes an integer number and returns how many divisors the number has.

```
def number_of_divisors(n):
    import math
    a = int(math.sqrt(n)) #a: căn bậc 2 của n
    count = 0
    print (f"Divisor of {n} are: ", end = " ")
    for i in range (1, a+1):
        if n%i ==0:
            count +=1
            if i == n//i:
                print (i, end = " ")
            else:
                print (i,n//i, end = " ")
                count+=1
    return print(F"\nNumber of divisors: {count}")
n = eval(input("Enter n: "))
number_of_divisors(n)
```

```
Enter n: 100
Divisor of 100 are:  1 100 2 50 4 25 5 20 10
Number of divisors: 9
```

EXERCISE 5: STRINGS AND LISTS

```
s1 = "Introduction to programming"
s2 = "ro"
```

1. Suppose that s1, s2 are two strings, given as follows:
What are the results of the following expressions?

a) s2.count('o')
b) s1.upper()
c) s1.find(s2)
d) s1[4]
e) s1[4 : 8]
f) s1[-4]
g) s1[-4: -8]
h) s1.startswith("o")
i) s1.endswith("o")
j) s1.isalpha()
k) s1 + s1
l) 'J' + s1[1:]

```
s1 = "Introduction to programming"
s2 = "ro"
print (s2.count('o'))
print (s1.upper())
print (s1.find(s2))
print (s1[4])
print (s1[4:8])
print (s1[-4])
print (s1[-4:-8])
print (s1.startswith("o"))
print (s1.endswith('o'))
print (s1.isalpha())
print (s1+s1)
print ("J"+s1[1:])
```

```
1
INTRODUCTION TO PROGRAMMING
3
o
oduc
m

False
False
False
Introduction to programmingIntroduction to programming
Jntroduction to programming
```

2. What is the output of the following code?

1. list1 = list(range(1,10,2))
2. list2 = list1
3. list1[0]= 111
4. print(list1)
5. print(list2)

```
list1 = list(range(1,10,2)) #1,3,5,7,9
list2 = list1 #list 2 đang tham chiếu đến vị trí mà list 1 đang tham chiếu
list1[0] = 111
print (list1)
print (list2)
```

```
[111, 3, 5, 7, 9]
[111, 3, 5, 7, 9]
```

3. Write a program that prompts the user to enter two strings s1, s2 and sorts them in increasing order.

```
s1 = str(input("Enter 1st string: "))
s2 = str(input("Enter 2nd string: "))
if s1 <= s2:
    print (s1,s2)
else:
    print (s2,s1)
```

```
Enter 1st string: abc
Enter 2nd string: abd
abc abd
```

4. Write a program that prompts the user to enter a string and tests whether the string is a palindrome or not.

```
s2 = str(input("Enter a string: "))
s1 = s2[::-1]
if s1 == s2:
    print ('Is Palindrome')
else:
    print ("Not Palindrome")
```

```
Enter a string: anna
Is Palindrome
```

5. Write a Python program to get a string made of the first 2 and the last 2 chars from a given a string. If the string length is less than 2, return instead of the empty string.

```
def check ():
    s1 = str(input("Enter string: "))
    while len(s1)>=2:
        return print (s1[0:2]+s1[-2:])
    return ""
check()
```

```
Enter string: abcd
abcd
```

6. Write a function named **mismatch** that accepts two strings as input arguments and returns:

- 0 if the two strings match exactly.
- 1 if the two strings have the same length and mismatch in only one character.
- 2 if the two strings do not have the same length or mismatch in two or more characters.

Capital letters are considered the same as lower case letters. Here are some examples:

S1 = "Python", S2 = "Java" → return 2
S1 = "Hello There", S2 = "helloothere" → return 1
S1 = "dog", S2 = "Dog" → return 0

Cách 1:

In [81]:

```
def mismatch (s1,s2):
    if len(s1) == len(s2):
        s1 = s1.lower()
        s2 = s2.lower()
        if s1 == s2:
            return 0
        else:
            count = 0
            for i in range (len(s1)):
                if s1[i] == s2[i]:
                    continue # nếu chữ cái theo thứ tự giống nhau, thì bỏ qua, ngược lại cộng vào count
                count +=1
            if count == 1:
                return 1
            else:
                return 2
    else:
        return 2
a = str(input("Enter 1st string: "))
b = str(input("Enter 2nd string: "))
mismatch(a,b)
```

```
Enter 1st string: helloothere
Enter 2nd string: Hello There
```

Out[81]: 1

Cách 2:

In [32]:
```
def mismatch(s1,s2):
    if len(s1) == len(s2):
        return 0
    elif len(s1) == len(s2):
        count = 0
        for i in range(len(s1)):
            if s1[i]!=s2[i]:
                count = count +1
                return 1
        if count == 1:
            return 1
        else:
            return 2
    else:
        return 2
s1 = str(input('Enter s1: '))
s2 = str(input('Enter s2: '))
print(mismatch(s1,s2))

```

```
Enter s1: dog
Enter s2: Dog
0
```

7. Write a program that prompts the user to enter a Social Security number in the format **ddd-dd-dddd**, where d is a digit. The program displays Valid SSN for a correct Social Security number or Invalid SSN otherwise.

Cách 1:

```
n = str(input("Enter a Social Security Number in the format ddd-dd-dddd, where d is a digit: "))
n1,n2,n3 = n[:3], n[4:6], n[7:11]

if len(n)!=11 or n1.isdigit==False or n2.isdigit==False or n3.isdigit==False or n[3]!="-" or n[6]!="-":
    print ('Invalid SSN')
else:
    print ("Valid SSN")
```

```
Enter a Social Security Number in the format ddd-dd-dddd, where d is a digit: 222-22-2354
Valid SSN
```

Cách 2:

In [24]:
```
ssn =input('Enter ssn: ')
flag = 1
if len(ssn) != 11:
    flag = 0
elif ssn[3] != '-' or ssn[6] != '-' or ssn[:3].isdigit == False\
or ssn[4:6] == False or ssn[-4:] == False:
    flag = 0
if flag == 1:
    print('Valid ssn')
else:
    print('Invalid ssn')
```

```
Enter ssn: 123-45-6789
Valid ssn
```

8. Write a function that checks whether a string is a valid password. Suppose the password rules are as follows:

- A password must have at least eight characters.
- A password must consist of only letters and digits.
- A password must contain at least two digits.

Write a program that prompts the user to enter a password and displays valid password if the rules are followed or invalid password otherwise.

Cách 1:

```
def password(p):
    if len(p) <8 or p.isalnum()==False:
        print ("Invalid password")
    else:
        count = 0
        for i in range (0, len(p)):
            if p[i].isdigit() == True: #Nhớ thêm ngoặc () chỗ isdigit
                count +=1
            else:
                continue
        if count < 2:
            print ("Invalid password")
        else:
            print ("Valid password")
a = str(input("Enter password: "))
password(a)
```

```
Enter password: abcderf1234
Valid password
```

Cách 2:

```
    def vaildpass(n):

        if len(n)<8:
            return False
        elif n.isalnum() == False:
            return False
        else:
            count = 0
            for e in n:
                if e.isdigit() == True:
                    count = count + 1
            if count < 2:
                return False
        return True
n = input('Enter n: ')
print(vaildpass(n))
```

```
Enter n: QUAN2004
True
```

9. Write a program that prompts the user to enter a list of integers:

a. Sum all elements in the list
b. Find minimum and maximum element in the list
c. Search an X element in the list
d. Count occurrences of an element X in the list
e. Print index of the first occurrence of element X in the list.

```
# Q.9 _ex5:
ds = eval(input("Enter a list:"))
print (sum(ds))
print (max(ds), min (ds))
x = eval(input("Enter x: "))
if x in ds:
    print (f'{x} is in the list')
    print ('first occurences', ds.index(x))
else:
    print (f'{x} is not in the list')
print (ds.count(x))
```

```
Enter a list:[5,3,1,3]
12
5 1
Enter x: 5
5 is in the list
first occurences 0
1
```

10. Given list of numbers $a_0, a_1, \ldots, a_{n-1}$. Write a program to:

a. Print all the negative elements in the list

b. Find sum of all the negative elements in the list

c. Check whether all elements in the list are positive or NOT

d. Sort the List in ascending /descending order.

```
#Q10
#ds = []
#n = int(input("Enter number of element: "))
#for i in range(0,n):
    #ele = int(input())
    #ds.append(ele)    #Dùng khi đề bài yêu cầu n phần tử
ds = eval(input("Enter the list: "))
#a and b
flag = False
s = 0
for e in ds:
    if e < 0:
        flag = True
        s = s + e
        print(e, end =" ")
if flag == False:
    print('list has no negative element')
else:
    print()
    print(s)

#c
flag = True
for e in ds:
    if e <= 0:
        flag = False
if flag == False:
    print("positive")
else:
    print('not positive')

#d
#descending
ds.sort(reverse = True)
print(ds)
#ascending
ds.sort()
print(ds)
```

```
Enter the list: [4,5,6,7-3,-4,-6]
-4 -6
-10
positive
[6, 5, 4, 4, -4, -6]
[-6, -4, 4, 4, 5, 6]
```

11. Write a program that prompts the user to enter two lists of integers and **find common numbers from two lists *(using list comprehension / for loop).***

```
#Q.11
ds1 = [5,4,3,2,8,9]
ds2 = [7,3,5,4,6]
common = [e for e in ds1 if e in ds2]
print (common)
```

```
[5, 4, 3]
```