1. Write a program that calculates and prints the value according to the given formula:

Q = Square root of [(2 * C * D)/H]

Following are the fixed values of C and H:

C is 50. H is 30.

D is the variable whose values should be input to your program in a comma-separated sequence.

Example

Let us assume the following comma separated input sequence is given to the program:

100,150,180

The output of the program should be:

18,22,24

Ans:

In [1]:
```
from math import sqrt
C = 50
H = 30
D = eval(input('Enter int values separated by commma: '))
output =[]
for i in D:
    Q = str(int(sqrt((2*C* i)/H)))
    output.append(Q)
print('Output: {}'.format(','.join(output)))
```

```
Enter int values separated by commma: 100,150,180
Output: 18,22,24
```

2. Write a program which takes 2 digits, X,Y as input and generates a 2-dimensional array. The element value in the i-th row and j-th column of the array should be i*j.

Note: i=0,1.., X-1; j=0,1,¡Y-1.

Example

Suppose the following inputs are given to the program:

3,5

Then, the output of the program should be:

[[0, 0, 0, 0, 0], [0, 1, 2, 3, 4], [0, 2, 4, 6, 8]]

Ans:

In [4]:
```
import array as arr
X = int(input('Enter the No of Rows:'))
Y = int(input('Enter the No of Columns:'))
matrix = []
def Gen_Mat(X,Y):
    for i in range(X):
        matrix.insert(X,[])
        for j in range(Y):
            matrix[i].append(i*j)
    print(matrix)
Gen_Mat(X,Y)
```

```
Enter the No of Rows:3
Enter the No of Columns:5
[[0, 0, 0, 0, 0], [0, 1, 2, 3, 4], [0, 2, 4, 6, 8]]
```

3. Write a program that accepts a comma separated sequence of words as input and prints the words in a comma-separated sequence after sorting them alphabetically.

Suppose the following input is supplied to the program:

without,hello,bag,world

Then, the output should be:

bag,hello,without,world

Ans:

In [5]:
```
string = str(input("Enter a sequence of words separated by commas: "))
words = [word.lower() for word in string.split(',')]
words.sort()
print("After sorting alphabetically:")
for word in words:
    print(word, end =',')
```

```
Enter a sequence of words separated by commas: without,hello,bag,world
After sorting alphabetically:
bag,hello,without,world,
```

4. Write a program that accepts a sequence of whitespace separated words as input and prints the words after removing all duplicate words and sorting them alphanumerically.

Suppose the following input is supplied to the program:
hello world and practice makes perfect and hello world again
Then, the output should be:
again and hello makes perfect practice world

Ans:

In [9]:
```
string = input('Enter a sentence: ')
newstring = string.split(' ')
modstring = ' '.join(sorted(sorted(list(set(newstring)))))
print(modstring)
```

```
Enter a sentence: i i am oliver for to for you
am for i oliver to you
```

5. Write a program that accepts a sentence and calculate the number of letters and digits.

Suppose the following input is supplied to the program:
hello world! 123
Then, the output should be:
LETTERS 10
DIGITS 3

Ans:

In [17]:
```
string = input('Enter a setence:')
letters = 'ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz'
digits = '0123456789'
wordcount = 0
numcount = 0
for i in string:
    if i in letters:
        wordcount += 1
    elif i in digits:
        numcount +=1
print('Word ', wordcount)
print('Digit ', numcount)
```

```
Enter a setence:hello world! 123
Word  10
Digit  3
```

6. A website requires the users to input username and password to register. Write a program to check the validity of password input by users.

Following are the criteria for checking the password:
1. At least 1 letter between [a-z]
2. At least 1 number between [0-9]
1. At least 1 letter between [A-Z]

3. At least 1 character from [$#@]
4. Minimum length of transaction password: 6
5. Maximum length of transaction password: 12

Your program should accept a sequence of comma separated passwords and will check them according to the above criteria. Passwords that match the criteria are to be printed, each separated by a comma.

Example

If the following passwords are given as input to the program:

ABd1234@1,a F1#,2w3E*,2We3345

Then, the output of the program should be:

ABd1234@1

Ans:

In [21]:

```
string = input("Enter the Input String: ")
specialchars = "$#@"
def checkPassword(string):
    for ele in string.split(','):
        if len(ele) <= 12 and len(ele) >=6 :
            if any(i.isupper() for i in ele):
                if any(i.islower() for i in ele):
                    if any(i for i in ele if i in specialchars):
                        print(ele)
checkPassword(string)
```

```
Enter the Input String: ABd1234@1,a F1#,2w3E*,2We3345
ABd1234@1
```