1. Write a program that asks the user for weight in kilograms and converts it to pounds. There are 2.2 pounds in a kilogram.

Source Code:

```python
kilo_grams = float(input("kg: "))
pounds = kilo_grams * 2.2
print('lb:', pounds)
```

Output:

Expected Output:
kg:·120
lb:·264.0

Explanation:

The program reads a number from a user representing KGs, and converts it into a float number. Then the number is converted from KGs to Lbs (Pounds) and prints both KGs and Lbs.

2. Write a program that asks the user to enter three numbers (use three separate input statements). Create variables called total and average that hold the sum and average of the three numbers and print out the values of total and average.

Source Code:

```python
num1 = int(input("Num1: "))
num2 = int(input("Num2: "))
num3 = int(input("Num3: "))
sum=(num1 + num2 + num3)
print("Total: " , sum)
average = (num1 + num2 + num3) / 3
print("Avg:","%.3f" % average)
```

Output:

Expected Output:
Num1:·3
Num2:·5
Num3:·6
Total:··14
Avg:·4.667

3. Write a program that uses a for loop to print the numbers 8, 11, 14, 17, 20, . . . , 83, 86, 89.

Source Code:

```python
fmt = "%s"
for i in range(8,90,3):
    print(fmt % i, end="")
    fmt = ",%s"
```

Output:

8,11,14,17,20,23,26,29,32,35,38,41,44,47,50,53,56,59,62,65,68,71,74,77,80,83,86,89,

4. Write a program that asks the user for their name and how many times to print it. The program should print out the user's name a specified number of times.

Source Code:

```python
word = input('Enter your name: ')
number = int(input('How many times to print your name?: '))
for i in range(number):
    print(word)
```

Output

What is your name city
Enter a number 6
city
city
city
city
city
city

5. Use a for loop to print a triangle like the one below. Allow the user to specify how high the triangle should be.

```
*
* *
* * *
* * * *
```

Source Code:

```python
rows = int(input('Enter rows: '))
for i in range(1,rows+1):
    for j in range(0,i):
        print('*', end=' ')
    print('')
```

Output

Enter the number of rows: 5

```
*
* *
* * *
* * * *
* * * * *
```

6. Generate a random number between 1 and 10. Ask the user to guess the number and print a message based on whether they get it right or not.

Source Code:

```python
import random
target_num = int(input('Enter a number : '))
while target_num<0 or target_num>10:
    target_num = int(input('Enter a guess : '))
else:
    print('Well guessed!')
"""
import random
#target_num = int(input('Enter a number : '))
print('Enter a number : ')
target_num = random.randint(1, 10)
guess_num = 5
while target_num != guess_num:
    guess_num = int(input('Enter a guess : '))
print('Well guessed!')
"""
```

Output

Enter a number : 99
Enter a guess : 88
Enter a guess : 9
Well guessed!

7. Write a program that asks the user for two numbers and prints Close if the numbers are within .001 of each other and not close otherwise.

Source Code:

```python
a = float(input("Enter first number : "))
b = float(input("Enter second number : "))
c = abs(a - b)
if c > 0.0009 and c <= 0.001 :
```

```
        print("Close")
else :
    print("Not Close")
```

Output 1:

Enter first number : 1.00
Enter second number : 0.02
Not Close

Output 2:

Enter first number : 4.001
Enter second number : 4.002
Close

8. Write a program that asks the user to enter a word and prints out whether that word contains any vowels.

Source Code:
```python
string = input("String: ")
vowels = 0
consonants = 0
list = ["a","e","i","o","u","A","E","I","O","U"]
for letters in string:
    if letters in list:
        vowels +=1
    else:
        consonants +=1
if vowels>0:
    print("Vowels exist")
else:
    print("Vowels doesn't exist")
```

Output:
String: Engineering
Vowels exist
String: CSDS
Vowels doesn't exist

9. Write a program that asks the user to enter two strings of the same length. The program should then check to see if the strings are of the same length. If they are not, the program should print an appropriate message and exit. If they are of the same length, the program should alternate the characters of the two strings. For example, if the user enters abcde and ABCDE the program should print out AaBbCcDdEe.

Source Code:

```python
def alternate_string(s1,s2):
    new_string=""
    if len(s1)==len(s2):
        for i in range(len(s1)):
            new_string=new_string+s1[i]+s2[i]
        print("Merged string:",new_string)
    else:
        print("Strings are of diffeent length")
    return new_string
print("Enter 2 strings with same length")
string1=input("Enter first string: ")
string2=input("Enter second string: ")
alternate_string(string1,string2)
```

Output:

Enter 2 strings with same length
Enter first string: ABCDE
Enter second string: abcde
Merged string: AaBbCcDdEe

10. Write a program that asks the user for a large integer and inserts commas into it according to the standard American convention for commas in large numbers. For instance, if the user enters 1000000, the output should be 1,000,000.

Source Code:

```python
n=int(input("Enter input number: "))
print("Number with comma separator is: {:,}".format(n))
```

Output:

Enter input number: 1000000

> Number·with·comma·separator·is:··1,00
> 0,000

11. In algebraic expressions, the symbol for multiplication is often left out, as in 3x+4y or 3(x+5). Computers prefer those expressions to include the multiplication symbol, like 3*x+4*y or 3*(x+5). Write a program that asks the user for an algebraic expression and then inserts multiplication symbols where appropriate.

Source Code:

```python
expr=input("Enter any expression: ")
new_expr=""
count=0
for i in expr:
    ind=expr[count+1:count+2]
    if i.isdigit():
        if ind.isalpha() or ind=='(':
            new_expr+=i+"*"
        else:
            new_expr+=i
    elif i.isalpha() or i==')':
        if ind=='(':
            new_expr+=i+'*'
        else:
            new_expr+=i
    else:
        new_expr+=i
    count+=1
print(new_expr)
```

Output:

> Enter·any·expression:··x(5x+4y+6z)(2v)
> x*(5*x+4*y+6*z)*(2*v)

12. Write a program that generates a list of 20 random numbers between 1 and 100.
(a) Print the list.
(b) Print the average of the elements in the list.
(c) Print the largest and smallest values in the list.
(d) Print the second largest and second smallest entries in the list
(e) Print how many even numbers are in the list.

Source Code:

```python
import random
numList=[]
random.seed(10)
#for i in range(20):
#    numList.append(random.randint(1,100))
numList=random.sample(range(1, 100), 20)

print("List is:",numList)
print("Avg is: ",sum(numList)/20)
print("Largest element is:",sorted(numList)[-1])
print("Smallest element is:",sorted(numList)[0])
print("Second Largest element is:",sorted(numList)[-2])
print("Second Smallest element is:",sorted(numList)[1])
count=0
for value in numList:
        if value%2==0:
            count+=1
print("Even numbers in the list:",count)
```

Output 1:

```
List is: [74, 5, 55, 62, 2, 27, 60, 63, 36, 84, 21, 67, 42, 10, 32, 96, 47, 6, 54, 18]
Avg is:  43.05
Largest element is: 96
Smallest element is: 2
Second Largest element is: 84
Second Smallest element is: 5
Even numbers in the list: 13
```