

```
from tkinter import *
def run():
    a11= sa11.get()
    a12= sa12.get()
    a13= sa13.get()
    a21= sa21.get()
    a22= sa22.get()
    a23= sa23.get()
    a31= sa31.get()
    a32= sa32.get()
    a33= sa33.get()

    A11= sA11.get()
    A12= sA12.get()
    A13= sA13.get()
    A21= sA21.get()
    A22= sA22.get()
    A23= sA23.get()
    A31= sA31.get()
    A32= sA32.get()
    A33= sA33.get()

    a11=float(a11)
    a12=float(a12)
    a13=float(a13)
    a21=float(a21)
    a22=float(a22)
    a23=float(a23)
    a31=float(a31)
    a32=float(a32)
    a33=float(a33)

    A11=float(A11)
    A12=float(A12)
    A13=float(A13)
    A21=float(A21)
    A22=float(A22)
    A23=float(A23)
    A31=float(A31)
    A32=float(A32)
    A33=float(A33)
```

```
list1 = [a11,a12,a13]
list2 = [a21,a22,a23]
list3 = [a31,a32,a33]
```

```
list4 = [A11,A12,A13]
list5 = [A21,A22,A23]
list6 = [A31,A32,A33]
```

```
print("Matrix a =",list1)
print("      ",list2)
print("      ",list3)
print()
print()
print("Matrix A =",list4)
print("      ",list5)
print("      ",list6)
print()
print()
```

```
b11= a11*A11+a12*A21+a13*A31
b12= a11*A12+a12*A22+a13*A32
b13= a11*A13+a12*A23+a13*A33
```

#multiplying matrix

```
b21= a21*A11+a22*A21+a23*A31
b22= a21*A12+a22*A22+a23*A32
b23= a21*A13+a22*A23+a23*A33
```

```
b31= a31*A11+a32*A21+a33*A31
b32= a31*A12+a32*A22+a33*A32
b33= a31*A13+a32*A23+a33*A33
```

```
b11=float("%.2f" % b11)
b12=float("%.2f" % b12)
b13=float("%.2f" % b13)
b21=float("%.2f" % b21)
b22=float("%.2f" % b22)
b23=float("%.2f" % b23)
b31=float("%.2f" % b31)
b32=float("%.2f" % b32)
b33=float("%.2f" % b33)
```

#converting into values

```
final_list1 = [b11,b12,b13]
final_list2 = [b21,b22,b23]
final_list3 = [b31,b32,b33]

line1 = Label(text = '''[
|
|
|
|
[
''' )
line1.pack()
line1.place(x = 355 , y = 193)

line2 = Label(text = ''' ]
|
|
|
|
]''')
line2.pack()
line2.place(x = 500 , y = 193)

mat = Label(text = "Matrix axA =", fg = "dark blue", bg = "light green")
mat.pack()
mat.place(x = 270 , y = 230)

B11 = Label(text = b11)
B11.pack()
B11.place(x = 375 , y = 200)

B21 = Label(text = b21)
B21.pack()
B21.place(x = 375 , y = 230)

B31 = Label(text = b31)
B31.pack()
B31.place(x = 375 , y = 260)

B12 = Label(text = b12)
B12.pack()
B12.place(x = 415 , y = 200)
```

```

B22 = Label(text = b22)
B22.pack()
B22.place(x = 415 , y = 230)

B32 = Label(text = b32)
B32.pack()
B32.place(x = 415 , y = 260)

B13 = Label(text = b13)
B13.pack()
B13.place(x = 455 , y = 200)

B23 = Label(text = b23)
B23.pack()
B23.place(x = 455 , y = 230)

B33 = Label(text = b33)
B33.pack()
B33.place(x = 455 , y = 260)

print("Matrix axA =", final_list1)
print("          ",final_list2)
print("          ",final_list3)

```

```

def run1():
    #getting input values
    a11= sa11.get ()
    a12= sa12.get ()
    a13= sa13.get ()
    a21= sa21.get ()
    a22= sa22.get ()
    a23= sa23.get ()
    a31= sa31.get ()
    a32= sa32.get ()
    a33= sa33.get ()
    A11= sA11.get ()
    A12= sA12.get ()
    A13= sA13.get ()
    A21= sA21.get ()
    A22= sA22.get ()
    A23= sA23.get ()

```

```
A31= sA31.get()  
A32= sA32.get()  
A33= sA33.get()
```

```
a11=float(a11)                                     #converting into points  
a12=float(a12)  
a13=float(a13)  
a21=float(a21)  
a22=float(a22)  
a23=float(a23)  
a31=float(a31)  
a32=float(a32)  
a33=float(a33)  
A11=float(A11)  
A12=float(A12)  
A13=float(A13)  
A21=float(A21)  
A22=float(A22)  
A23=float(A23)  
A31=float(A31)  
A32=float(A32)  
A33=float(A33)
```

```
list1 = [a11,a12,a13]  
list2 = [a21,a22,a23]  
list3 = [a31,a32,a33]
```

```
list4 = [A11,A12,A13]  
list5 = [A21,A22,A23]  
list6 = [A31,A32,A33]
```

```
print("Matrix a =",list1)  
print("          ",list2)  
print("          ",list3)  
print()  
print()  
print("Matrix A =",list4)  
print("          ",list5)  
print("          ",list6)  
print()  
print()
```



```
line2.pack()
line2.place(x = 240 , y = 193)

mat = Label(text = "Matrix a+A =", fg = "dark blue", bg = "light green")
mat.pack()
mat.place(x = 20 , y = 230)

B11 = Label(text = b11)                                #printing values on screen
B11.pack()
B11.place(x = 120 , y = 200)

B21 = Label(text = b21)
B21.pack()
B21.place(x = 120 , y = 230)

B31 = Label(text = b31)
B31.pack()
B31.place(x = 120 , y = 260)

B12 = Label(text = b12)
B12.pack()
B12.place(x = 160 , y = 200)

B22 = Label(text = b22)
B22.pack()
B22.place(x = 160 , y = 230)

B32 = Label(text = b32)
B32.pack()
B32.place(x = 160 , y = 260)

B13 = Label(text = b13)
B13.pack()
B13.place(x = 200 , y = 200)

B23 = Label(text = b23)
B23.pack()
B23.place(x = 200 , y = 230)

B33 = Label(text = b33)
B33.pack()
B33.place(x = 200 , y = 260)
```

```
print("Matrix a+A =", final_list1)
print("              ", final_list2)
print("              ", final_list3)
```

```
def run2():                                     #getting input values
    a11= sa11.get()
    a12= sa12.get()
    a13= sa13.get()
    a21= sa21.get()
    a22= sa22.get()
    a23= sa23.get()
    a31= sa31.get()
    a32= sa32.get()
    a33= sa33.get()
    A11= sA11.get()
    A12= sA12.get()
    A13= sA13.get()
    A21= sA21.get()
    A22= sA22.get()
    A23= sA23.get()
    A31= sA31.get()
    A32= sA32.get()
    A33= sA33.get()

    a11=float(a11)                             #converting into points
    a12=float(a12)
    a13=float(a13)
    a21=float(a21)
    a22=float(a22)
    a23=float(a23)
    a31=float(a31)
    a32=float(a32)
    a33=float(a33)
    A11=float(A11)
    A12=float(A12)
    A13=float(A13)
    A21=float(A21)
    A22=float(A22)
    A23=float(A23)
    A31=float(A31)
    A32=float(A32)
    A33=float(A33)
```



```
list1 = [a11,a12,a13]
list2 = [a21,a22,a23]
list3 = [a31,a32,a33]
```

```
list4 = [A11,A12,A13]
list5 = [A21,A22,A23]
list6 = [A31,A32,A33]
```

```
print("Matrix a =",list1)
print("          ",list2)
print("          ",list3)
print()
print()
print("Matrix A =",list4)
print("          ",list5)
print("          ",list6)
print()
print()
```

```
b11= a11-A11                                #subtracting matrix
b12= a12-A12
b13= a13-A13
```

```
b21= a21-A21
b22= a22-A22
b23= a23-A23
```

```
b31= a31-A31
b32= a32-A32
b33= a33-A33
```

```
b11=float("%.2f" % b11)                    #converting into values
b12=float("%.2f" % b12)
b13=float("%.2f" % b13)
b21=float("%.2f" % b21)
b22=float("%.2f" % b22)
b23=float("%.2f" % b23)
b31=float("%.2f" % b31)
b32=float("%.2f" % b32)
b33=float("%.2f" % b33)
```

```
final_list1 = [b11,b12,b13]
final_list2 = [b21,b22,b23]
```

```

final_list3 = [b31,b32,b33]
#printing labels on screen

line1 = Label(text = ''' [

[

'''
)
line1.pack()
line1.place(x = 605 , y = 193)

line2 = Label(text = '''

[

'''
)
line2.pack()
line2.place(x = 745 , y = 193)

mat = Label(text = "Matrix a-A =", fg = "dark blue", bg = "light green")
mat.pack()
mat.place(x = 525 , y = 230)

B11 = Label(text = b11)
#printing values on screen
B11.pack()
B11.place(x = 625 , y = 200)

B21 = Label(text = b21)
B21.pack()
B21.place(x = 625 , y = 230)

B31 = Label(text = b31)
B31.pack()
B31.place(x = 625 , y = 260)

B12 = Label(text = b12)
B12.pack()
B12.place(x = 665 , y = 200)

B22 = Label(text = b22)
B22.pack()

```

```
B22.place(x = 665 , y = 230)
```

```
B32 = Label(text = b32)
```

```
B32.pack()
```

```
B32.place(x = 665 , y = 260)
```

```
B13 = Label(text = b13)
```

```
B13.pack()
```

```
B13.place(x = 705 , y = 200)
```

```
B23 = Label(text = b23)
```

```
B23.pack()
```

```
B23.place(x = 705 , y = 230)
```

```
B33 = Label(text = b33)
```

```
B33.pack()
```

```
B33.place(x = 705 , y = 260)
```

```
print("Matrix a-A =", final_list1)
```

```
print("          ",final_list2)
```

```
print("          ",final_list3)
```

```
def run3():
```

```
#getting input values
```

```
a11= sa11.get()
```

```
a12= sa12.get()
```

```
a13= sa13.get()
```

```
a21= sa21.get()
```

```
a22= sa22.get()
```

```
a23= sa23.get()
```

```
a31= sa31.get()
```

```
a32= sa32.get()
```

```
a33= sa33.get()
```

```
A11= sA11.get()
```

```
A12= sA12.get()
```

```
A13= sA13.get()
```

```
A21= sA21.get()
```

```
A22= sA22.get()
```

```
A23= sA23.get()
```

```
A31= sA31.get()
```

```
A32= sA32.get()
```

```
A33= sA33.get()
```

```
n= sn.get()
```

#converting into points

```
a11=float(a11)
a12=float(a12)
a13=float(a13)
a21=float(a21)
a22=float(a22)
a23=float(a23)
a31=float(a31)
a32=float(a32)
a33=float(a33)
A11=float(A11)
A12=float(A12)
A13=float(A13)
A21=float(A21)
A22=float(A22)
A23=float(A23)
A31=float(A31)
A32=float(A32)
A33=float(A33)
n=float(n)

list1 = [a11,a12,a13]
list2 = [a21,a22,a23]
list3 = [a31,a32,a33]

list4 = [A11,A12,A13]
list5 = [A21,A22,A23]
list6 = [A31,A32,A33]

print("Matrix a =",list1)
print("          ",list2)
print("          ",list3)
print()
print()
print("Matrix A =",list4)
print("          ",list5)
print("          ",list6)
print()
print()

b11= n*a11
b12= n*a12
b13= n*a13
```

#scalar multiplication matrix

```
b21= n*a21
b22= n*a22
b23= n*a23

b31= n*a31
b32= n*a32
b33= n*a33
```

```
b11=float("%.2f" % b11)           #converting into values
b12=float("%.2f" % b12)
b13=float("%.2f" % b13)
b21=float("%.2f" % b21)
b22=float("%.2f" % b22)
b23=float("%.2f" % b23)
b31=float("%.2f" % b31)
b32=float("%.2f" % b32)
b33=float("%.2f" % b33)
```

```
final_list1 = [b11,b12,b13]
final_list2 = [b21,b22,b23]
final_list3 = [b31,b32,b33]
```

```
line1 = Label(text = '''           #printing labels on screen
```

```
line1.pack()
line1.place(x = 855 , y = 193)
```

```
line2 = Label(text = '''
```

```
line2.pack()
line2.place(x = 998 , y = 193)
```

```
mat = Label(text = "Matrix n.a =", fg = "dark blue", bg = "light green")
mat.pack()
```

```
mat.place(x = 775 , y = 230)

B11 = Label(text = b11)                                #printing values on screen
B11.pack()
B11.place(x = 875 , y = 200)

B21 = Label(text = b21)
B21.pack()
B21.place(x = 875 , y = 230)

B31 = Label(text = b31)
B31.pack()
B31.place(x = 875 , y = 260)

B12 = Label(text = b12)
B12.pack()
B12.place(x = 915 , y = 200)

B22 = Label(text = b22)
B22.pack()
B22.place(x = 915 , y = 230)

B32 = Label(text = b32)
B32.pack()
B32.place(x = 915 , y = 260)

B13 = Label(text = b13)
B13.pack()
B13.place(x = 955 , y = 200)

B23 = Label(text = b23)
B23.pack()
B23.place(x = 955 , y = 230)

B33 = Label(text = b33)
B33.pack()
B33.place(x = 955 , y = 260)

print("Matrix n.a =", final_list1)
print("              ",final_list2)
print("              ",final_list3)
```

```

screen = Tk()                                #screen setting
screen.title("Matrix Multiplication" ,)
screen.geometry("1050x400")

welcome = Label(text = "Welcome please enter matrix a,λ to solve your question ", fg = "red", bg = "yellow")
welcome.pack()
welcome.place(x = 375, y =10)

matrix_a = Label(text = "Matrix a = ", fg = "black")
matrix_a.pack()
matrix_a.place(x = 15, y = 87)

matrix_λ = Label(text = "Matrix λ = ", fg = "black")
matrix_λ.pack()
matrix_λ.place(x = 515, y =87)

scalar = Label(text = "n.a =", fg = "black")
scalar.pack()
scalar.place(x = 852.5, y =325.5)

sa11 = StringVar()                           #1st matrix location boxes
a11 = Entry(text = sa11)
a11.pack()
a11.place( x=80 ,y =60)

sa12 = StringVar()
a12 = Entry(text = sa12)
a12.pack()
a12.place( x=210 ,y =60)

sa13 = StringVar()
a13 = Entry(text = sa13)
a13.pack()
a13.place( x=340 ,y =60)

sa21 = StringVar()
a21 = Entry(text = sa21)
a21.pack()
a21.place( x=80 ,y =90)

sa22 = StringVar()

```

```
a22 = Entry(text = sa22)
a22.pack()
a22.place( x=210 ,y =90)

sa23 = StringVar()
a23 = Entry(text = sa23)
a23.pack()
a23.place( x=340 ,y =90)

sa31 = StringVar()
a31 = Entry(text = sa31)
a31.pack()
a31.place( x=80 ,y = 120)

sa32 = StringVar()
a32 = Entry(text = sa32)
a32.pack()
a32.place( x=210 ,y =120)

sa33 = StringVar()
a33 = Entry(text = sa33)
a33.pack()
a33.place( x=340 ,y =120)
```

```
sA11 = StringVar()
A11 = Entry(text = sA11)
A11.pack()
A11.place( x=580 ,y =60)
```

#2st matrix location boxes

```
sA12 = StringVar()
A12 = Entry(text = sA12)
A12.pack()
A12.place( x=710 ,y =60)
```

```
sA13 = StringVar()
```



```
A13 = Entry(text = sA13)
A13.pack()
A13.place( x=840 ,y =60)

sA21 = StringVar()
A21 = Entry(text = sA21)
A21.pack()
A21.place( x=580 ,y =90)

sA22 = StringVar()
A22 = Entry(text = sA22)
A22.pack()
A22.place( x=710 ,y =90)

sA23 = StringVar()
A23 = Entry(text = sA23)
A23.pack()
A23.place( x=840 ,y =90)

sA31 = StringVar()
A31 = Entry(text = sA31)
A31.pack()
A31.place( x=580 ,y = 120)

sA32 = StringVar()
A32 = Entry(text = sA32)
A32.pack()
A32.place( x=710 ,y =120)

sA33 = StringVar()
A33 = Entry(text = sA33)
A33.pack()
A33.place( x=840 ,y =120)

sn = StringVar()
n = Entry(text = sn)
n.pack()
n.place( x=884 ,y =327)
```

#buttons command

```
click = Button(text = "multiplication of a x A", fg = "red", bg = "yellow" , command = run)
click.place(x = 366, y = 350)

click = Button(text = "Addition of a + A", fg = "red", bg = "yellow" , command = run1)
click.place(x = 123, y = 350)

click = Button(text = "minus of a - A", fg = "red", bg = "yellow" , command = run2)
click.place(x = 638, y = 350)

click = Button(text = " scalar multiplication of n.a", fg = "red", bg = "yellow" , command = run3)
click.place(x = 854, y = 350)

screen.mainloop()
```

OUTPUT

Welcome please enter matrix a,A to solve your question

Matrix a =

| | | |
|-------|-------|-------|
| 43.45 | 34.45 | 54.56 |
| 24.35 | 75.65 | 23.26 |
| 32.67 | 34 | 44 |

Matrix A =

| | | |
|-------|-------|-------|
| 35 | 68 | 23.34 |
| 31 | 43.56 | 76 |
| 45.57 | 32.32 | 23.45 |

Matrix a + A =

$$\begin{bmatrix} 78.45 & 102.45 & 77.9 \\ 55.35 & 119.21 & 99.26 \\ 78.24 & 66.32 & 67.45 \end{bmatrix}$$

Addition of a + A

Matrix a x A =

$$\begin{bmatrix} 5075.0 & 6218.62 & 4911.76 \\ 4257.36 & 5702.86 & 6863.18 \\ 4202.55 & 5124.66 & 4378.32 \end{bmatrix}$$

multiplication of a x A

Matrix a - A =

$$\begin{bmatrix} 8.45 & -33.55 & 31.22 \\ -6.65 & 32.09 & -52.74 \\ -12.9 & 1.68 & 20.55 \end{bmatrix}$$

minus of a - A

Matrix n.a =

$$\begin{bmatrix} 1868.35 & 1481.35 & 2346.08 \\ 1047.05 & 3252.95 & 1000.18 \\ 1404.81 & 1462.0 & 1892.0 \end{bmatrix}$$

n.a = 43

scalar multiplication of n.a