**PROGRAM CODE:**

list=['mena','arun','lina','shuba','jai','ashwin','rahul','devi','john','jack']

n=input('Enter the name of a student : ')

list.append(n)

print('The new list is ',list)

index=0

name=input('Enter name of student to be searched: ')

for i in list:

if name in i:

print(name ,'is found at index ',index)

else:

index=index+1

**OUTPUT:**

Enter the name of a student: vaishali

The new list is ['mena', 'arun', 'lina', 'shuba', 'jai', 'ashwin', 'rahul', 'devi', 'john', 'jack', 'vaishali']

Enter name of student to be searched: shuba

shuba is found at index 3

**PROGRAM CODE:**

jee=['divya','edward','mena','arun','lina','shuba','jai','ashwin','rahul','devi','john']

neet=['gayatri’,mena' ,'lina','shuba','kumar','aishu','rahul','devi','john','jack']

print('Students who passed JEE: ')

print(jee)

print()

print('Students who passed NEET: ')

print(neet)

print()

#both exams

both = []

for element in jee:

if element in neet:

both.append(element)

print('List of students who have qualified both exams: ')

print(both)

print()

#only jee

ojee=[]

for i in jee:

if i not in both:

ojee.append(i)

print('List of students who have qualified only in JEE: ')

print(ojee)

print()

#only neet

oneet=[]

for j in neet:

if j not in both:

oneet.append(j)

print('List of students who have qualified only in NEET: ')

print(oneet)

print()

#atleast one exam

list4=[]

for k in ojee:

list4.append(k)

for name in oneet:

list4.append(name)

for s in both:

list4.append(s)

print('Students who attended atleast one exam: ')

print(list4)

**OUTPUT:**

Students who passed JEE:

['divya', 'edward', 'mena', 'arun', 'lina', 'shuba', 'jai', 'ashwin', 'rahul', 'devi', 'john']

Students who passed NEET:

['gayatri’,mena', 'lina', 'shuba', 'kumar', 'aishu', 'rahul', 'devi', 'john', 'jack']

List of students who have qualified both exams:

['lina', 'shuba', 'rahul', 'devi', 'john']

List of students who have qualified only in JEE:

['divya', 'edward', 'mena', 'arun', 'jai', 'ashwin']

List of students who have qualified only in NEET:

['gayatri’,mena', 'kumar', 'aishu', 'jack']

Students who attended atleast one exam:

['divya', 'edward', 'mena', 'arun', 'jai', 'ashwin', 'gayatri’,mena', 'kumar', 'aishu', 'jack', 'lina', 'shuba', 'rahul', 'devi', 'john']

**PROGRAM CODE:**

#Binary Search

def binary\_search(sortedlist,n,x):

start=0

end=n

while(start<=end):

mid=(start+end)//2

if (x==sortedlist[mid]):

return mid

elif(x < sortedlist[mid]):

end = mid - 1

else:

start = mid + 1

return -1

sorted\_cubes=[1,8,27,64,125,216,343,512,729,1000]

print('The list of sorted cubes are: ')

print( sorted\_cubes)

n=len(sorted\_cubes)

x = int(input("Enter the number to be searched: "))

position = binary\_search(sorted\_cubes,n,x)

if(position != -1):

print("Entered number",x,"is present at position: ",position)

else:

print("Entered number",x,"is not present in the list")

print()

#linear search

def linear\_search(list, key):

for j in range(len(list)):

if list[j] == key:

return j

else:

return -1

unsorted\_cubes=[8,343,1,1000,125,27,512,64,216,729]

print('The list of unsorted cubes are:')

print(unsorted\_cubes)

key=int(input('Enter the number to be searched: '))

val=linear\_search(unsorted\_cubes,key)

if val==-1:

print("Entered number",key,"is not present in the list")

else:

print("Entered number",key,"is present at position: ",val)

**OUTPUT:**

The list of sorted cubes are:

[1, 8, 27, 64, 125, 216, 343, 512, 729, 1000]

Enter the number to be searched: 125

Entered number 125 is present at position: 4

The list of unsorted cubes are:

[8, 343, 1, 1000, 125, 27, 512, 64, 216, 729]

Enter the number to be searched: 27

Entered number 27 is present at position: 5

**PROGRAM CODE:**

l=int(input('enter lower range '))

u=int(input('enter upper range '))

odd=[]

even=[]

list=[]

for k in range(l,u+1):

list.append(k)

print('The list of numbers are ',list)

for num in list:

if num%2==0:

even.append(num)

else:

odd.append(num)

print('The list of even numbers are ',even)

print('The list of odd numbers are ',odd)

**OUTPUT:**

enter lower range 1

enter upper range 15

The list of numbers are [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15]

The list of even numbers are [2, 4, 6, 8, 10, 12, 14]

The list of odd numbers are [1, 3, 5, 7, 9, 11, 13, 15]

**PROGRAM CODE:**

stu=['anitha','saritha','furleen','divya','edward','rahul','ibrahim']

#new student

s1=input('Enter the name of the new student: ')

print()

stu.append(s1)

print('The list of students are: ')

print(stu)

print()

#no of students

l=len(stu)

print('The no of students registered for the course are: ',l)

print()

#first and last student

first=min(stu)

last=max(stu)

print('The first student and the last student in lexographical order are ',first,'and ',last,'respectively')

print()

#new list

n=int(input('Enter no of new students: '))

for i in range(0,n):

e=input('Enter name of student {}: '.format(i+1))

stu.append(e)

print()

print('The new list of students are: ',stu)

print()

#sort

stu.sort()

print('The sorted name list is: ',stu)

print()

#reg no

regno=[]

reg=101

print('The list of students with register no are: ')

for i in range(len(stu)):

regno.append(reg)

reg=reg+1

print(regno[i],stu[i])

print()

#insert new student

new=input('Enter the name of the new student: ')

for i in range (len(stu)):

if stu[i]<new<stu[i+1]:

p=i+1

break

stu.insert(p,new)

a=regno[-1]+1

regno.append(a)

print('The modified list is ')

print(stu)

print()

#search for a student name

name=input('Enter name of student to be searched: ')

position=stu.index(name)

print('The reg no of the student is: ',regno[position])

print()

#discontinued

rname=input('Enter name to be removed: ')

index=stu.index(rname)

stu.remove(rname)

d=regno.pop(index)

for i in range(index,len(stu)):

regno[index]=d

d+=1

print('The updated list is: ',stu)

print()

#name list for exam

print('The name list for the exam is: ')

for i in range(len(stu)):

print(regno[i],stu[i])

**OUTPUT:**

Enter the name of the new student: john

The list of students are:

['anitha', 'saritha', 'furleen', 'divya', 'edward', 'rahul', 'ibrahim', 'john']

The no of students registered for the course are: 8

The first student and the last student in lexographical order are anitha and saritha respectively

Enter no of new students: 4

Enter name of student 1: abi

Enter name of student 2: raja

Enter name of student 3: kala

Enter name of student 4: catherine

The new list of students are: ['anitha', 'divya', 'edward', 'furleen', 'ibrahim', 'john', 'rahul', 'saritha', 'abi', 'raja', 'kala', 'catherine']

The sorted name list is: ['abi', 'anitha', 'catherine', 'divya', 'edward', 'furleen', 'ibrahim', 'john', 'kala', 'rahul', 'raja', 'saritha']

The list of students with register no are:

101 abi

102 anitha

103 catherine

104 divya

105 edward

106 furleen

107 ibrahim

108 john

109 kala

110 rahul

111 raja

112 saritha

Enter the name of the new student: fathima

The modified list is

['abi', 'anitha', 'catherine', 'divya', 'edward', 'fathima', 'furleen', 'ibrahim', 'john', 'kala', 'rahul', 'raja', 'saritha']

Enter name of student to be searched: divya

The reg no of the student is: 104

Enter name to be removed: ibrahim

The updated list is: ['abi', 'anitha', 'catherine', 'divya', 'edward', 'fathima', 'furleen', 'john', 'kala', 'rahul', 'raja', 'saritha']

The name list for the exam is:

101 abi

102 anitha

103 catherine

104 divya

105 edward

106 fathima

107 furleen

108 john

109 kala

110 rahul

111 raja

112 saritha

**PROGRAM CODE:**

def rev(list):

rev=[]

for i in range(-1,-(len(list)+1),-1):

rev.append(list[i])

return rev

list=[1,2,3,4,5,6,7,8,9]

print('The list is ',list)

r=rev(list)

print('The reversed list is ',r)

**OUTPUT:**

The list is [1, 2, 3, 4, 5, 6, 7, 8, 9]

The reversed list is [9, 8, 7, 6, 5, 4, 3, 2, 1]

**PROGRAM CODE:**

def clone(lista):

listb=lista[:]

e=int(input('Enter a no '))

listb.append(e)

listb.sort()

print("List 'a' after cloning ",lista)

def alias(lista):

listb=lista

e=int(input('Enter a no '))

listb.append(e)

listb.sort()

print("List 'a' after aliasing ",lista)

lista=[]

n=int(input('Enter no of nos '))

for i in range(0,n):

e=int(input('Enter no {} '.format(i+1)))

lista.append(e)

print('List a outside function is ',lista)

clone(lista)

alias(lista)

**OUTPUT:**

Enter no of nos 5

Enter no 1 13

Enter no 2 24

Enter no 3 35

Enter no 4 98

Enter no 5 86

List a outside function is [13, 24, 35, 98, 86]

Enter a no 50

List 'a' after cloning [13, 24, 35, 98, 86]

Enter a no 90

List 'a' after aliasing [13, 24, 35, 86, 90, 98]

**PROGRAM CODE:**

def matrix(m):

for i in range(len(m)):

for j in range (len(m[0])):

m[i][j]=(m[i][j])\*\*2

a=[[1,2,3],[4,5,6],[8,9,0]]

print('The matrix is ',a)

matrix(a)

print('The updated matrix is ',a)

**OUTPUT:**

The matrix is [[1, 2, 3], [4, 5, 6], [8, 9, 0]]

The updated matrix is [[1, 4, 9], [16, 25, 36], [64, 81, 0]]

**PROGRAM CODE:**

def add(MA, MB):

r=len(MA)

c=len(MB)

M = []

for i in range(0,r):

M.append([])

for j in range(0,c):

ele = MA[i][j] + MB[i][j]

M[i].append(ele)

return M

a=[[1,2,3],[4,5,6],[2,8,9]]

b=[[6,7,8],[2,4,0],[1,2,8]]

ra=len(a)

ca=len(a[0])

rb=len(b)

cb=len(b[0])

if ( (ra != rb) or (ca != cb) ):

print("Rows and columns of given matrices do not match.")

print("Cannot Add the matrices.")

else:

print('The matrix a is ',a)

print('The matrix b is ',b)

print(add(a,b))

**OUTPUT:**

The matrix a is [[1, 2, 3], [4, 5, 6], [2, 8, 9]]

The matrix b is [[6, 7, 8], [2, 4, 0], [1, 2, 8]]

The resultant matrix is

[[7, 9, 11], [6, 9, 6], [3, 10, 17]]

**PROGRAM CODE:**

def mul(MA, MB, ra, ca, cb):

M = []

for i in range(0,ra):

M.append([])

for j in range(0,cb):

ele = 0

for k in range(0,ca,1):

ele = ele + (MA[i][k] \* MB[k][j])

M[i].append(ele)

return M

a=[[1,2,3],[4,5,6],[3,0,1]]

b=[[6,7,8],[2,4,0],[2,0,0]]

ra=len(a)

ca=len(a[0])

rb=len(b)

cb=len(b[0])

if ca!=rb:

print("Rows and columns do not match.")

print("Cannot multiply.")

else:

print('The matrix a is ',a)

print('The matrix b is ',b)

print(mul(a,b,ra,ca,cb))

a=[[1,2,3],[4,5,6],[3,0,1]]

b=[[6,7,8],[2,4,0],[2,0,0]]

print('The matrix a is ',a)

print('The matrix b is ',b)

print(mul(a,b))

**OUTPUT:**

The matrix a is [[1, 2, 3], [4, 5, 6], [3, 0, 1]]

The matrix b is [[6, 7, 8], [2, 4, 0], [2, 0, 0]]

The resultant matrix is

[[16, 15, 8], [46, 48, 32], [20, 21, 24]]