List- Solutions

1.

1. fruit=['banana','mango','apple','peach','grapes']
2. City=['Delhi','Chennai','Kannur','Jalandhar','Hyderabad']
3. Mixed=['banana','apple','grapes',12,13] (iv) Box=[1,5,2,['a','b']]
4. R10=[random.randint(10,50) for i in range(10)]
5. F10=[random.randint(1000,4999)/100 for i in range(10)]
6. y=[x\*x+2\*x-1 for x in range(-4,6)]
7. C=[random.randint(-30,-20) for x in range(10)] (ix) A=[3,5,6.7]

(x) B=[A,[1,2,3]]

2.

* 1. A[2] is an element of A and A[2:] is a slice of A.
  2. Slice A[2:] contains all elements of A starting from A[2] till the last element. Slice A[:2] contains only the elements A[0] and A[1].
  3. Slice A[2::] contains all elements of A starting from A[2] till the last element. Slice A[::2] contains alternate elements of A starting from A[0] till the last element.
  4. A\*3 represents a list which contains all elements of A thrice. [A,A,A] represents a list which contains three instances of list A.

3.

|  |  |  |
| --- | --- | --- |
| (i) 12 | (ii) 8 | (iii) 6 |
| (iv) [8,10,12,23,33,16,6,2,1] | (v) [6,2,1] | (vi) [3,8,23,6] |
| (vii) [12,23,33,16,6,2,1] | (viii) [8,6] | (ix) [6,33,12,8,6] |
| (x) [1,16,12,7] | (xi) [8,23] | (xii) [] |
| (xiii) 9 | (xiv) 3 | (xv) 4 |

4.

|  |  |  |  |
| --- | --- | --- | --- |
| (i) True | (ii) False | (iii) False | (iv) True |
| (v) True | (vi) False | (vii) False | (viii) True |
| (ix) True | (x) False |  |  |

5. 2\*3\*2\*3\*2\*

6. 0

# 0

0

[2, 4] [-2, -3, 3, -4]

4 -2

[2] [-3, 3, -4]

7. 1 appears in nums 3 times. Its first occurence is at index 0

# 2 appears in nums 3 times. Its first occurence is at index 1 4 appears in nums 1 times. Its first occurence is at index 7 5 appears in nums 2 times. Its first occurence is at index 4 7 appears in nums 2 times. Its first occurence is at index 2 9 appears in nums 1 times. Its first occurence is at index 3

8.

(i) [5, 3, 8]

(ii) [[5, 3, 8], 8, 66, 45, 'A', ['A', [5, 3, 8]], ['nested', 'lists']]

(iii) 5

(iv) [5, 3, 8]

(v) []

(vi) [5, 3, 8]

1. 3
2. [3, 8]
3. A

(x) ['A', [5, 3, 8]]

(xi) [5, 3, 8]\*8\*66\*45\*A\*['A', [5, 3, 8]]\*['nested', 'lists']\*

(xii) ['A', [5, 3, 8]]

# 45

66

9. [1, 2, 3, 4, 5, 7, 9]

# [5, 3, 9, 7, 1, 2, 4]

[5, 3, 9, 7, 1, 2, 4]

[5, 3, 9, 7, 1, 2, 4]

10. [1, 2, 7]

# [5, 3, 9, [1, 2, 7], 4]

[5, 3, 9, [1, 2, 7], 4]

[5, 3, 9, [1, 2, 7], 4]

[5, 3, 9, [7, 1, 2], 4]

[1, 10, 7]

[5, 3, 9, [1, 10, 7], 4]

[5, 3, 9, [1, 10, 7], 4]

[5, 3, 9, [1, 10, 7], 4]

[5, 3, 9, [7, 55, 2], 4]

11.

(i) a=[1,2,3,2,1]

for x in **a**:

print(x)

1. a=["Umang","Usman","Utkarsh","Umedh"] for x in range(len(a)):

print(a**[**x**]**)

1. A=8\*[3]

for i in range(5):

A[i]=eval("A[i]\*i") OR A[i]=A[i]\*i for i in **range(len(**A**))**: OR for i in **A**: print(A**[**i**]**) print(**i**)

1. n=0 #The counter for i in nums:

n+=1

print("length of the list is: ",n)

1. print("The original list is: ",num) for i in range(len(num)):

if num[i]%5==0: num[i]//=5

else: num[i]\*=2

print("The changed list is: ",num)

1. print("The original list is: ",num) for i in range(len(num)):

if num[i]%2==0: num[i]//=2

else: num[i]\*=2

print("The changed list is: ",num)

1. num=[] #[] creates an empty list for i in range(10):

n=int(input("Enter a number: ")) num+=[n] #Inserts number n in the list

print("List in reverse order is: ")

for i in range(-1,-11,-1): #OR range(9,-1,-1) print(num[i],end=' ')

1. num=[] #[] creates an empty list sum=0

for i in range(10): n=eval(input("Enter a number: ")) sum+=n

num+=[n] #Inserts number n in the list avg=sum/10

print("Sum =",sum) print("Average =",avg)

print("Numbers greater than the average are: ") for i in num:

if i>avg:

print(i, end=' ');

1. from random import randint

num=[randint(10,99) for i in range (10)] #[] creates the list print("The list is: ",num)

print("Odd elements of the list are: ", end=" ") for i in num:

if (i%2==1):

print(i, end=" ")

1. from random import random

num=[ round(random()\*100,2) for i in range (10)] print("The list is: ",num)

i,j=0,5 #first half of the list starts at num[0], and #second half starts at num[5]

while i<5:

num[i],num[j]=num[j],num[i] i+=1

j+=1

print("The list after swap is: ",num)

1. from random import randint

n=int(input("How many numbers do you want in the list? ")) num=[ randint(1,25) for i in range (n)]

print("The list is: ",num)

i,j=0,(n+1)//2 #first half of the list starts at num[0], and #second half starts at num[(n+1)//2]

while j<n:

num[i],num[j]=num[j],num[i] i+=1

j+=1

print("The list after swap is: ",num)

1. from random import random num=[round(random()\*100,2) for i in range(10)] print("The list is: ",num)

for i in range(0,10,2): num[i],num[i+1]=num[i+1],num[i]

print("The list after swap is: ",num)

1. from random import randint

n=int(input("How many NUMBERSbers do you want in the list? ")) NUMBERS=[ randint(1,25) for i in range (n)]

print("The list is: ",NUMBERS)

i,j=0,n-1 while i<j:

NUMBERS[i],NUMBERS[j]=NUMBERS[j],NUMBERS[i] i+=1

j-=1

print("The list after swap is: ",NUMBERS)

1. from random import randint num=[randint(100,999) for i in range(10)]

print("The list is: ",num)

print("Prime numbers in the list are:", end=" ") for i in num:

count=0 factor=2

while factor<=i\*\*0.5: if (i%factor==0):

count+=1 factor+=1

if count==0:

print(i, end=' ')

1. from random import randint nums=[randint(1,20) for i in range(20)] print("Original list:",nums) nums.reverse()

n=20 #length of the list i=0;

while i<n:

ele=nums[i]

while (nums.count(ele)>1): nums.remove(ele);

if (n!=len(nums)): n=len(nums)

else: i+=1 nums.reverse() print("Shortened list:",nums)

1. A=eval(input("Enter first list: ")) B=eval(input("Enter second list: ")) print("Original Lists: ") print("A:",A)

print("B:",B) for i in B:

while i in A:

A.remove(i) print("After removal: ") print("A:",A)

print("B:",B)

A=[randint(10,99) for i in range(5)] B=[randint(100,999) for i in range(10)] print("Original Lists: ") print("A:",A)

print("B:",B) A.sort() B.sort(reverse=True) l1=len(A)

l2=len(B)

print("After sorting: ") print("A:",A)

print("B:",B) C=[]

i,j=0,l2-1

while i<l1 and j>=0: if A[i]<B[j]:

C.append(A[i]) i+=1

else:

C.append(B[j]) j-=1

while i<l1:

C.append(A[i]) i+=1

while j>=0:

C.append(B[j]) j-=1

print("Merged list: ") print("C:",C)

1. from random import randint n=10

A=[randint(10,99) for i in range(10)] B=[randint(1,9) for i in range(10)] print("Original Lists: ") print("A:",A)

print("B:",B) C=[]

for i in range(10): ele=2\*A[i]+3\*B[i] C.append(ele)

print("Resultant list: ") print("C:",C)

1. ALL=[] l1=len(first) l2=len(second) i=j=0

while i<l1 and j<l2: ALL.append(second[j]) ALL.append(first[i]) i+=1

j+=1

while i<l1:

ALL.append(first[i]) i+=1

while j<l2:

ALL.append(second[j]) j+=1

1. from random import randint A=eval(input("Enter the list: ")) temp=A[0]

l=len(A)

for i in range(l-1): A[i]=A[i+1]

A[l-1]=temp print("Resultant list:",A)

1. P=eval(input("Enter the list: ")) l=len(P)

i=0

while i<l-1:

if P[i]%10==0: P[i],P[i+1]=P[i+1],P[i] i+=2

else:

i+=1

print("Resultant list:",P)

1. P=eval(input("Enter the list: ")) l=len(P)

i=0

for i in range(l): if P[i]%5==0:

P[i]=5

else:

P[i]=0

print("Resultant list:",P)

1. P=eval(input("Enter the list: ")) l=len(P)

i=0

for i in range(l): if P[i]%2==0:

s=0

while P[i]:

s+=P[i]%10

P[i]//=10 P[i]=s

else:

s=1

while P[i]:

s\*=P[i]%10 P[i]//=10

P[i]=s print("Modified list:",P)

1. Pay=eval(input("Enter the list: ")) l=len(Pay)

for i in range(l):

if Pay[i]<100000: Pay[i]+=0.25\*Pay[i]

elif Pay[i]<200000: Pay[i]+=0.20\*Pay[i]

else:

Pay[i]+=0.15\*Pay[i] print("Modified list:",Pay)

1. n1=int(input("Enter number of students in first class: "))

names1=n1\*[None] #A list of n1 elements where each element is of None type

print("Enter names of students (Press Enter after every name): ") for i in range(n1):

names1[i]=input()

n2=int(input("Enter number of students in second class: ")) names2=n2\*[None]

print("Enter names of students (Press Enter after every name): ") for i in range(n2):

names2[i]=input() combined=[] combined.extend(names1) combined.extend(names2) combined.sort()

print("Combined sorted list is: ") print(combined)

1. list=[] option=None

while (option != 0):

print("1. Append an element")

print("2. Remove an element from the list") print("3. Remove all elements from the list") print("4. Count the occurances of an element") print("5. Sort the list and display it") print("6. Reverse the list")

print("7. Display the list") print("0. Exit")

option=int(input("Enter your option: ")) if option==1:

ele=input("Enter the element to append: ") list.append(ele)

elif option==2:

ele=input("Enter the element to delete: ") if ele in list:

list.remove(ele) print(ele,"deleted from the list")

else: print(ele,"not is not present in the list") elif option==3:

list.clear() elif option==4:

ele=input("Enter the element: ") n=list.count(ele) print(ele,"appears",n,"times in the list")

elif option==5: list.sort();

print("The sorted list is: ") print(list)

elif option==6: list.reverse() print("List reversed")

elif option==7: print("The list is: ")

print(list)

1. list=[] option=None

while (option != 0):

print(" ")

print("1. Insert an element in the list")

print("2. Remove an element from a location in the list") print("3. Find the location of an element in the list")

print("4. Display the list in sorted order") print("5. Display the list in reverse order") print("6. Display the list")

print("0. Exit") option=int(input("Enter your option: ")) if option==1:

ele=input("Enter the element to be inserted: ") if (len(list)==0):

list.append(ele)

print("List was empty. Element inserted at position 0") else:

n=len(list)

print("Element can be inserted at location 0 to",n," OR at",-n,"to -1")

print("If the specified location is out of the range, element will be")

print("inserted either at the beginning or at the end of the list")

pos=int(input("Enter the location to insert the element

at: "))

list.insert(pos,ele) print(ele,"inseretd in the list")

elif option==2: n=len(list)-1

print("Element can be removed from location 0 to",n," OR from -1 to",-n)

pos=int(input("Enter the location to remove the element from: "))

if (pos not in range(0,n+1) and pos not in range(-n,0)): print("Invalid location")

else:

ele=list.pop(pos) print(ele,"removed from the list")

elif option==3:

ele=input("Enter the element to find its location: ") if ele not in list:

print(ele, "not found in the list") else:

pos=list.index(ele)

print(ele,"is present at location",pos,"in the list") elif option==4:

list1=sorted(list)

print("List in sorted order is: ") print(list1)

elif option==5:

print("The reverse list is: ") print("[ ",end='')

for i in range(len(list)-1,-1,-1): print(list[i], end=' ')

print("]") elif option==6:

print("The list is: ") print(list)

36. n=0

for i in nums: n+=1

found=-1

for i in range(n): if ele==nums[i]:

found=i break

if found==-1:

print("Element not found in the list")

else: print("Element found at location",found,"in the list")

1. student=[None]\*3

n=int(input("Enter the number of students: ")) data=[None]\*n

print("Now enter students data one by one: ") for i in range(n):

print("Students number",i+1,":") student[0]=int(input("Roll number: ")) student[1]=input("Name: ") student[2]=float(input("Marks: ")) data[i]=student.copy()

print("List of students scoring marks more than 75: ") for i in range(n):

if data[i][2]>75: print(data[i])

1. units=['','One','Two','Three','Four','Five','Six','Seven','Eight',' Nine', 'Ten','Eleven','Twelve','Thirteen','Fourteen','Fifteen','Sixteen', 'Seventeen','Eighteen','Ninteen'] tens=['','','Twenty','Thirty','Forty','Fifty','Sixty','Seventy','Ei ghty',

'Ninety']

n=int(input("Enter a two digit number: ")) if n not in range(10,100):

print("Number out of range") else:

if (n<20):

print(units[n]) else:

units\_digit=n%10 tens\_digit=n//10

print(tens[tens\_digit],units[units\_digit])

1. roll=[]

first=91041; last=91090 stop = 0

while not stop: print()

print("1. Student Enters") print("2. Student Exits") print("3. Student Count")

print("4. Smallest and Largest Roll number present") print("5. Absentees' list")

print("6. Sorted list of roll numbers") print("0. Exit")

option = int(input("Enter your option")) if (option==0):

stop=1

if option==1:

r = int(input("Enter roll number")) if (r<first or r>last):

print("Roll number out of range") elif r in roll:

print("Roll number already present") else: roll.append(r)

elif option==2:

r = int(input("Enter roll number")) if r in roll:

roll.remove(r) else:

print("Roll number not present") elif option==3:

print(len(roll),"students are present") elif option==4:

if len(roll)==0:

print('No student present') else:

small = min(roll) large = max(roll)

print("Smallest roll number present is:",small) print("Largest roll number present is:",large)

elif option==5:

if len(roll) == last-first+1: print("All students are present")

else:

print("The following roll numbers are absent: ") for r in range(first,last+1):

if not(r in roll): print(r, end=" ")

elif option == 6:

if len(roll)==0:

print("No student is present") else:

roll.sort()

print("The following roll numbers are present: ") for r in roll:

print(r, end=" ")