

Om Sri Sai Ram

- #① Write a program to Create a list, with Cubes of 2, 4, 6, 8, 10 with list comprehension.

```
nums = [2, 4, 6, 8, 10]
cubes = [n * n * n for n in nums]
print("numbers:", nums)
print("cubes:", cubes)
outputs: [2, 4, 6, 8, 10] → Numbers.
          cubes: [8, 64, 216, 512, 1000]
```

- #② Write a program to extract 1st character of each string in capital letters in a list of strings without comprehension.

```
cities = ['hyd', 'pune', 'chennai', 'Vijayawada']
result = []
for city in cities:
    result.append(city[0].upper())
print(result)
O/P: ['H', 'P', 'C', 'V']
```

- #③ Repeat previous program with comprehension.

```
cities = ['hyd', 'pune', 'chennai', 'Vijayawada']
result = [city[0].upper() for city in cities]
print(result)
```

- #④ Write a program to append each word of the sentence and its length to a list.
(word should be in Capital letters)
without comprehension.

Sentence = input ("Enter any sentence :")

words = sentence . split ()

result = []

for word in words :

 result . append ([word . upper (),
 len (word)])

print (result)

O/P :-

Enter any sentence : students are getting bored.

[['STUDENTS', 8], ['ARE', 3], ['GETTING', 7],
 ['BORED', 5]]

⑤ Repeat previous program with comprehension.

Input : hyd is green city .

Sentence = "hyd is green city "

result = [[word . upper (), len (word)] for
word in sentence . split ()]

print (result)

O/P :- [['HYD', 3], ['IS', 2], ['GREEN', 5],
 ['CITY', 4]]

⑥ Write a program to add two lists of unequal
length without comprehension.

Let 1st list be [10, 20, 30, 40, 50, 60, 70] and
2nd list be [100, 200, 300, 400]

(9)

```

list1 = [10, 20, 30, 40, 50, 60, 70]
list2 = [1, 2, 3, 4]
min_len = []
for result = []:
    for i in range(min_len):
        result.append(list1[i] + list2[i])
print(result)

```

O/p :-

Enter 1st list : [10, 20, 30, 40, 50, 60, 70]
 Enter 2nd list : [1, 2, 3, 4]
 O/p : [11, 22, 33, 44]

- ⑦ Write a program to initialize a nested list with zeroes without comprehension.
 Hint: use repetition operator *

(10)

```

rows = int(input("How many lists ?: "))
cols = int(input("How many elements in each list ?: "))
nested = []
for i in range(rows):
    nested.append([0] * cols)
print(nested)

```

- ⑧ Repeat previous program with comprehension
 Inputs : 3 and 4
 O/p :

[[0, 0, 0, 0], [0, 0, 0, 0], [0, 0, 0, 0]]

(11)

rows = 3

cols = 4

nested = [[0]*cols for _ in range(rows)]

print(nested)

- (9) Write a program to extract those elements of 1st list which are not in 2nd list without comprehension.

Let 1st list be [10, 20, 15, 18, 25, 32]

2nd list be [30, 40, 10, 25, 15]

list1 = [10, 20, 15, 18, 25, 32]

list2 = [30, 40, 10, 25, 15]

result = []

for x in list1:

if x not in list2:

result.append(x)

print("Elements of 1st list which are not 2nd list:", result)

- (10) Repeat previous program with comprehension.

list1 = [10, 20, 15, 18, 25, 32]

list2 = [30, 40, 10, 25, 15]

result = [x for x in list1 if x not in list2]

print(result)

O/P: [20, 18, 32]

- (11) Write a program to print even numbers between 1 and 20 with comprehension.

"Even numbers b/w 1 and 20:

[2, 4, 6, 8, 10, 12, 14, 16, 18, 20]

(15) EVens = [x for x in range(1, 21) if x % 2 == 0]
 print ("even numbers between 1 and 20.",
 EVens)

(12) Repeat previous program with comprehension
 and without using if
 o/p: [Even numbers between 1 and 20]

EVens = [x for x in range(2, 21, 2)]
 print (" even numbers between 1 and 20.",
 EVens)

(13) Write a program to print those squares of
 1, 2, 3, 4, ..., 20
 which are divisible by 2 with comprehension.
 o/p: [4, 16, 36, ..., 400]

Squares = [x ** 2 for x in range(1, 21) if
 $(x ** 2) \% 2 == 0]$

print (" Squares of 1 to 20 which are
 divisible by 2: ", Squares)

(14) Repeat previous program with comprehension
 and without using if.

Squares = [x ** 2 for x in range(2, 21, 2)]
 print (" Squares of 1 to 20 which are
 divisible by 2: ", Squares)

(15) Write a program to add each element of 1st list with all the elements of 2nd list without comprehension.

Print : Nested for loops.

Let 1st list be [10, 20, 15] and
2nd list be [30, 40, 35, 32].

list1 = [10, 20, 15]

list2 = [30, 40, 35, 32]

result = []

for x in list1 :

 for y in list2 :

 result.append(x+y)

print(result)

O/P : [40, 50, 45, 22, 50, 60, 55, 32, 45, 55, 50, 27]

(16) Repeat previous program with comprehension.

list1 = [10, 20, 15]

list2 = [30, 40, 35, 32]

result = [x+y for x in list1 for y in list2]

print(result)

(17) Write a program to concatenate each character of 1st string with every character of 2nd string with comprehension.

Let 1st string be HYD and 2nd string be PUNE

str1 = "HYD"

str2 = "PUNE"

result = [ch1+ch2 for ch1 in str1 for ch2 in str2]

print(result)

O/P :- ['HP', 'HU', 'HN'

(18) write a program to convert a nested list to list without comprehension.

```
nested = [[10,20], [30,40,50], [60,70,80,90]]
```

~~flat = []~~

for sublist in nested:

for item in sublist:

for item in sublist:
 flat.append(item)

print (flat)

(19) Write a program to convert a nested list to list with comprehension.

```
nested := [[10,20], [30,40,50], [60,70,80,90]]
```

flat = [item for sublist in nested for item in sublist]

print (flat)

(20) Find outputs.

$$a = [[10, 20], [30, 40, 50], [60, 70, 80, 90]]$$

$b = [x \text{ for } x \text{ in } a \text{ for } y \text{ in } x]$

Point (b)

$y[x] = [10, 20] \rightarrow$ inner loop runs for 2 elements
add $[10, 20], [10, 20]$.

2) $x = [30, 40, 50] \rightarrow$ inner loop runs for 3 elements.
 add $[30, 40, 50], [30, 40, 50], [30, 40, 50]$

3) $x = [60, 70, 80, 90] \rightarrow$ inner loop runs for 4 seconds
add $[60, 70, 80, 90]$ four times.

(21)

Nested Comprehension demo program.

 $a = [[j \text{ for } j \text{ in range}(i)] \text{ for } i \text{ in range}(5)]$

print(a)

outer loop \rightarrow for i in range(5) $\rightarrow i = 0, 1, 2, 3, 4$.inner loop \rightarrow for j in range(i) \rightarrow generate $[0, 1, 2, \dots, i-1]$ $i=0 \rightarrow \text{range}(0) = []$ $i=1 \rightarrow \text{range}(1) = [0]$ $i=2 \rightarrow \text{range}(2) = [0, 1]$ $i=3 \rightarrow \text{range}(3) = [0, 1, 2]$ $i=4 \rightarrow \text{range}(4) = [0, 1, 2, 3]$

(22)

most tricky program.

Input : list of strings

eg : ['swathi', 'Anand', 'srinivas', 'zebra', 'king',
. 'Amar']

Output : Nested list

 $a = ['swathi', 'Anand', 'srinivas', 'zebra', 'king',
. 'Amar']$ $c = []$ $b = []$

for name in a :

first = name[0]

if first not in b :

d = [x for x in a if x[0] == first]

c.append(d)

b.append(first)

print(c)

(23)

Write a program to merge two sorted lists to produce another sorted list.

Hint: Unsorted lists can not be merged.

Hint2: Use single while loop.

a = [10, 20, 30, 40, 50]

b = [5, 12, 20, 37]

c = []

i = 0

j = 0

while i < len(a) and j < len(b):

if a[i] <= b[j]:

c.append(a[i])

i += 1

else:

c.append(b[j])

j += 1

while i < len(a):

c.append(a[i])

i += 1

while j < len(b):

c.append(b[j])

j += 1

print(c)

(24)

Write a program to determine n-th largest element of a list.

input1: [10, 20, 30, 25, 40, 35, 12, 5]

input2: 3 (3rd largest)

Output: 30

(25)

a = [10, 20, 30, 25, 40, 35, 12, 5]

n = int(input("Enter which largest element to be shown : "))

a_sorted = sorted(a, reverse = True)

print(f"\n{n}th Largest Element :

{a_sorted[n-1]}")

Q25) " Write a program to sort a list without using sorted() function and sort() method.

Input : [10, 20, 30, 25, 40, 35, 12, 5]

O/P : [5, 10, 12, 20, 25, 30, 35, 40]

a = [10, 20, 30, 25, 40, 35, 12, 5]

n = len(a)

for i in range(n):

 for j in range(0, n-i-1):

 if a[i] > a[j+1]:

 a[i] > a[j+1] :

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

print("Sorted list:", a)