2.

def arg\_first\_alphabetically(lst):

states=['Mississippi', 'Maryland', 'Delaware', 'Connecticut', 'Virginia', 'Utah', 'Kansas',

'Wyoming', 'Indiana', 'Louisiana', 'Missouri', 'Illinois', 'Minnesota', 'Vermont',

'New Mexico', 'North Dakota', 'Wisconsin', 'Tennessee', 'New York', 'Oklahoma',

'Colorado', 'Pennsylvania', 'West Virginia', 'Alabama', 'Montana', 'Texas',

'Washington', 'Michigan', 'New Hampshire', 'Arkansas', 'Hawaii', 'Iowa',

'Idaho', 'Kentucky', 'Ohio', 'Nebraska', 'Alaska', 'Oregon', 'South Dakota',

'New Jersey', 'Florida', 'Georgia', 'Rhode Island', 'Arizona', 'Maine',

'South Carolina', 'California', 'Nevada', 'Massachusetts', 'North Carolina']

index = states.index('Alabama')

print('The index of Alabama:', index)

Input: arg\_first\_alphabetically('lst')

Output: The index of Alabama: 23

3. def arg\_sort\_alphabetically(lst):

states=['Mississippi', 'Maryland', 'Delaware', 'Connecticut', 'Virginia', 'Utah', 'Kansas',

'Wyoming', 'Indiana', 'Louisiana', 'Missouri', 'Illinois', 'Minnesota', 'Vermont',

'New Mexico', 'North Dakota', 'Wisconsin', 'Tennessee', 'New York', 'Oklahoma',

'Colorado', 'Pennsylvania', 'West Virginia', 'Alabama', 'Montana', 'Texas',

'Washington', 'Michigan', 'New Hampshire', 'Arkansas', 'Hawaii', 'Iowa',

'Idaho', 'Kentucky', 'Ohio', 'Nebraska', 'Alaska', 'Oregon', 'South Dakota',

'New Jersey', 'Florida', 'Georgia', 'Rhode Island', 'Arizona', c'Maine',

'South Carolina', 'California', 'Nevada', 'Massachusetts', 'North Carolina']

states.sort()

print(states)

Input: arg\_sort\_alphabetically("lst")

Output: ['Alabama', 'Alaska', 'Arizona', 'Arkansas', 'California', 'Colorado', 'Connecticut', 'Delaware', 'Florida', 'Georgia', 'Hawaii', 'Idaho', 'Illinois', 'Indiana', 'Iowa', 'Kansas', 'Kentucky', 'Louisiana', 'Maine', 'Maryland', 'Massachusetts', 'Michigan', 'Minnesota', 'Mississippi', 'Missouri', 'Montana', 'Nebraska', 'Nevada', 'New Hampshire', 'New Jersey', 'New Mexico', 'New York', 'North Carolina', 'North Dakota', 'Ohio', 'Oklahoma', 'Oregon', 'Pennsylvania', 'Rhode Island', 'South Carolina', 'South Dakota', 'Tennessee', 'Texas', 'Utah', 'Vermont', 'Virginia', 'Washington', 'West Virginia', 'Wisconsin', 'Wyoming']

4. def outer\_product(a,b):

zip\_b = zip(\*b)

zip\_b = list(zip\_b)

return [[sum(ele\_a\*ele\_b for ele\_a, ele\_b in zip(row\_a, col\_b))

for col\_b in zip\_b] for row\_a in a]

x = [[1,2,3],[4,5,6],[7,8,9],[10,11,12]]

y = [[1,2],[1,2],[3,4]]

Input : outer\_product(x,y)

Output: [[12, 18], [27, 42], [42, 66], [57, 90]]

5. def cumulative\_sum(nums\_list):

return [sum(nums\_list[:i+1]) for i in range(len(nums\_list))]

Input : cumulative\_sum([1,2,3])

Output : [1, 3, 6]