Python programming-CSA0814

DAY 8

(14 aug 24)

**1.DISTINCT WAYS TO CLIMB A LADDER**

from math import comb

n = int(input("Enter the number of steps: "))

total\_ways = 0

for k in range(n // 2 + 1):

total\_ways += comb(n - k, k)

print(f"Number of distinct ways to climb to the top: {total\_ways}")

**OUTPUT:**

3

the distinct ways:3

**2.GET EXPRESSION AS INPUT AND GIVE OUTPUT**

expression = input("Enter an expression: ")

result = eval(expression)

print(f"Result: {result}")

**OUTPUT:**

2+3\*4-5

result=9

**3.INDEX OF REPEATING CHARACTER IN STRING**

from collections import Counter

s = input()

count = Counter(s)

first\_index = min(i for i in range(len(s)) if count[s[i]] > 1)

sorted\_s = ''.join(sorted(s))

print(f"Sorted String: {sorted\_s}, First Repeating Index: {first\_index}")

OUTPUT:

Sorted String: aggimmnoprr, First Repeating Index: 1

**4.INTRSECTION OF TWO ARRAY**

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

b = [2, 2, 4, 6]

intersection = list(set(a).intersection(set(b)))

print(intersection)

**OUTPUT:**

[2,4]

**5.ITEMS AND PROFIT**

import numpy as np

items = [

(1, 2), (2, 3),

(3, 4),

(4, 5),

(5, 6),

(2, 2),

(1, 1),

(4, 7)

]

capacity = 5

weights = [item[0] for item in items]

values = [item[1] for item in items]

n = len(items)

dp = np.zeros((n + 1, capacity + 1), dtype=int)

for i in range(1, n + 1):

for w in range(capacity + 1):

if weights[i - 1] <= w:

dp[i][w] = max(dp[i - 1][w], dp[i - 1][w - weights[i - 1]] + values[i - 1])

else:

dp[i][w] = dp[i - 1][w]

result = []

w = capacity

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

if dp[i][w] != dp[i - 1][w]:

result.append(items[i - 1])

w -= weights[i - 1]

print(f"Items included for maximum profit:")

for item in result:

print(f"Weight: {item[0]}, Value: {item[1]}")

print(f"Maximum profit: {dp[n][capacity]}")

**OUTPUT:**

Items included for maximum profit:

Weight: 4, Value: 7

Weight: 1, Value: 1

Maximum profit: 8

**6.PRINT REPEATED ELEMENTS OF ARRAY**

arr = list(map(int, input("Enter array elements: ").split()))

seen = set()

repeated = None

for num in arr:

if num in seen:

repeated = num

break

seen.add(num)

print(f"Repeated element: {repeated}")

**OUTPUT:**

2,1,3,4,2

Repeated element:2

**7.RETURN NUMBER MATCHES IN TWO STRINGS HAVING SAME CHARACTER IN SAME INDEX**

def count\_matches(s1, s2):

return sum(x == y for x, y in zip(s1, s2))

s1 = "python"

s2 = "potion"

result = count\_matches(s1, s2)

print(f"Number of matches: {result}")

**OUTPUT:**

4