

CAS0888 – PYTHON PROGRAMMING

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1.INPUT:

MAX_CHARS = 256

def areIsomorphic(string1, string2):

 m = len(string1)

 n = len(string2)

 if m != n:

 return False

 marked = [False] * MAX_CHARS

 map = [-1] * MAX_CHARS

 for i in xrange(n):

 if map[ord(string1[i])] == -1:

 if marked[ord(string2[i])] == True:

 return False

 marked[ord(string2[i])] = True

 map[ord(string1[i])] = string2[i]

 elif map[ord(string1[i])] != string2[i]:

 return False

 return True

print ("aab", "xxy")

2.INPUT:

def sumSquare(l):

 odd_sum = 0

 even_sum = 0

 for num in l:

 if num % 2 == 0:

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        even_sum += num ** 2
    else:
        odd_sum += num ** 2
    return [odd_sum, even_sum]
numbers = [1, 2, 3, 4, 5, 6, 7, 8, 9]
result = sumsquare(numbers)
print(result)

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3.INPUT:

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def is_happy(n):
    def get_next(num):
        next_num = 0
        while num > 0:
            digit = num % 10
            next_num += digit ** 2
            num //= 10
        return next_num
    slow = n
    fast = n
    while True:
        slow = get_next(slow)
        fast = get_next(get_next(fast))
        if slow == fast:
            break
    return slow == 1
num = 19
print(is_happy(num))

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4.INPUT:

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def is_palindrome(x):
    if x < 0:

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        return False

    original = x
    reverse = 0
    while x > 0:
        digit = x % 10
        reverse = reverse * 10 + digit
        x //= 10

    return original == reverse

num1 = 121
num2 = 123

print(is_palindrome(num1))
print(is_palindrome(num2))

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5.INPUT:

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def calculate_price(num_fresh, num_day_old):
    regular_price = (num_fresh + num_day_old) * 185
    discount = num_day_old * 185 * 0.60
    total_price = regular_price - discount
    return regular_price, discount, total_price

def main():
    try:
        num_fresh = int(input("Enter the number of fresh loaves purchased: "))
        num_day_old = int(input("Enter the number of day-old loaves purchased: "))
        if num_fresh < 0 or num_day_old < 0:
            print("Please enter non-negative numbers of loaves.")
        else:
            regular_price, discount, total_price = calculate_price(num_fresh, num_day_old)
            print("\nRegular Price: {:.2f} rupees".format(regular_price))
            print("Discount: {:.2f} rupees".format(discount))
    except ValueError:
        print("Invalid input. Please enter integers.")

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        print("Total Price: {:.2f} rupees".format(total_price))

except ValueError:

    print("Invalid input. Please enter valid integers.")

if __name__ == "__main__":

    main()

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6.INPUT:

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def max_area(height):

    left = 0

    right = len(height) - 1

    max_area = 0

    while left < right:

        h = min(height[left], height[right])

        w = right - left

        area = h * w

        max_area = max(max_area, area)

        if height[left] < height[right]:

            left += 1

        else:

            right -= 1

    return max_area

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

print(max_area(heights))

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7.INPUT:

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def count_sorted_vowel_strings(n):

    vowels = 'aeiou'

    def generate_strings(curr_str, index):

        if len(curr_str) == n:

            return 1

        count = 0

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        for i in range(index, len(vowels)):
            count += generate_strings(curr_str + vowels[i], i)

        return count

    return generate_strings("", 0)

n = 2

print(count_sorted_vowel_strings(n))

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8.INPUT:

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import re

def isNumber(s):

    s = s.strip()

    integer_pattern = r'^[+-]?\d+$'

    decimal_pattern = r'^[+-]?(\d+\.\d*|\.\d+)(e[+-]?\d+)?$'

    exponential_pattern = r'^[+-]?\d+e[+-]?\d+$'

    if re.match(integer_pattern, s):

        return True

    if re.match(decimal_pattern, s):

        return True

    if re.match(exponential_pattern, s):

        return True

    return False

valid_numbers = ["2", "0089", "-0.1", "+3.14", "4.", "-.9", "2e10", "-90E3", "3e+7", "+6e-1",
"53.5e93", "-123.456e789"]

invalid_numbers = ["abc", "1a", "1e", "e3", "99e2.5", "--6", "-+3", "95a54e53"]

for num in valid_numbers:

    print(f"{num}: {isNumber(num)}")

for num in invalid_numbers:

    print(f"{num}: {isNumber(num)}")

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9.INPUT:

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def max_guests_within_time_limit(T, E, L):

    max_guests = 0

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current_guests = 0
for i in range(T):
    current_guests += E[i] - L[i]
    max_guests = max(max_guests, current_guests)
return max_guests

T = 5
E = [7, 0, 5, 1, 3]
L = [1, 2, 1, 3, 4]
result = max_guests_within_time_limit(T, E, L)
print(result)

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10.INPUT:

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def modify_string(s):
    def circular_distance(ch):
        return (ord(ch) - ord('a') + 1) % 26

    char_frequency = {}
    modified_string = ""

    for ch in s:
        if ch in char_frequency:
            char_frequency[ch] += 1
        else:
            char_frequency[ch] = 1

    for ch in s:
        freq = char_frequency[ch]
        distance = circular_distance(ch)
        new_char = chr((ord('a') + distance - 1) % 26 + ord('a'))
        modified_string += new_char

    return modified_string

input_string = "abbccc"
result = modify_string(input_string)

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print(result)
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