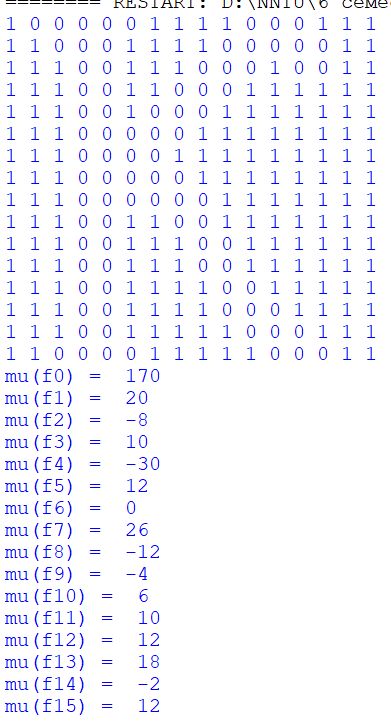
**Задача:**

Рассчитать μ для первой буквы фамилии.

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Черный = 0, белый = 1.

**Программная реализация:**



**Проверка (не всех значений):**

F0:

μ = 170

F1:

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μ = 95 – 75 = 20

F2:

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μ = 81 – 89 = -8

F6:

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μ = 85 – 85 = 0

F13:

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μ = 94 – 76 = 18

F15:

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μ = 91 – 79 = 12

**Код программы (python):**

Фильтры представляют собой матрицы, где закрашенная часть – «1», а не закрашенная – «-1» . Перемножаю элементы матрицы с буквой и фильтра и складываю их - получаю μ.

def printLetter(mass):

for row in mass:

for col in row:

print(col, end=" ")

print()

def firstLine(f,letter):

mu = 0

for row in range(16):

for col in range(16):

mu += f[col] \* letter[row][col]

return mu

def secondLine(f,letter):

mu = 0

for row in range(16):

for col in range(16):

mu += f[row//8][col] \* letter[row][col]

return mu

def thirdLine(f,letter):

mu = 0

for row in range(16):

for col in range(16):

mu += f[row//4][col] \* letter[row][col]

return mu

def fourthLine(f,letter):

mu = 0

for row in range(16):

for col in range(16):

if row < 4 or (row > 7 and row < 12):

mu += f[0][col] \* letter[row][col]

else:

mu += f[1][col] \* letter[row][col]

return mu

myLetter = [[1,0,0,0,0,0,1,1,1,1,0,0,0,1,1,1],

[1,1,0,0,0,1,1,1,1,0,0,0,0,0,1,1],

[1,1,1,0,0,1,1,1,0,0,0,1,0,0,1,1],

[1,1,1,0,0,1,1,0,0,0,1,1,1,1,1,1],

[1,1,1,0,0,1,0,0,0,1,1,1,1,1,1,1],

[1,1,1,0,0,0,0,0,1,1,1,1,1,1,1,1],

[1,1,1,0,0,0,0,1,1,1,1,1,1,1,1,1],

[1,1,1,0,0,0,0,0,1,1,1,1,1,1,1,1],

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[1,1,1,0,0,1,1,1,0,0,1,1,1,1,1,1],

[1,1,1,0,0,1,1,1,1,0,0,1,1,1,1,1],

[1,1,1,0,0,1,1,1,1,0,0,0,1,1,1,1],

[1,1,1,0,0,1,1,1,1,1,0,0,0,1,1,1],

[1,1,0,0,0,0,1,1,1,1,1,0,0,0,1,1]]

# Фильтры (по строкам, с нижней строки)

# 1 строка

f0 = [1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1]

f1 = [-1,-1,-1,-1,-1,-1,-1,-1,1,1,1,1,1,1,1,1]

f4 = [-1,-1,-1,-1,1,1,1,1,1,1,1,1,-1,-1,-1,-1]

f9 = [1,1,1,1,-1,-1,-1,-1,1,1,1,1,-1,-1,-1,-1]

# 2 строка

f2 = [[1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1],

[-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1]]

f3 = [[-1,-1,-1,-1,-1,-1,-1,-1,1,1,1,1,1,1,1,1],

[1,1,1,1,1,1,1,1,-1,-1,-1,-1,-1,-1,-1,-1]]

f6 = [[-1,-1,-1,-1,1,1,1,1,1,1,1,1,-1,-1,-1,-1],

[1,1,1,1,-1,-1,-1,-1,-1,-1,-1,-1,1,1,1,1]]

f11 = [[1,1,1,1,-1,-1,-1,-1,1,1,1,1,-1,-1,-1,-1],

[-1,-1,-1,-1,1,1,1,1,-1,-1,-1,-1,1,1,1,1]]

# 3 строка

f5 = [[-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1],

[1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1],

[1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1],

[-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1]]

f7 = [[1,1,1,1,1,1,1,1,-1,-1,-1,-1,-1,-1,-1,-1],

[-1,-1,-1,-1,-1,-1,-1,-1,1,1,1,1,1,1,1,1],

[-1,-1,-1,-1,-1,-1,-1,-1,1,1,1,1,1,1,1,1],

[1,1,1,1,1,1,1,1,-1,-1,-1,-1,-1,-1,-1,-1]]

f8 = [[1,1,1,1,-1,-1,-1,-1,-1,-1,-1,-1,1,1,1,1],

[-1,-1,-1,-1,1,1,1,1,1,1,1,1,-1,-1,-1,-1],

[-1,-1,-1,-1,1,1,1,1,1,1,1,1,-1,-1,-1,-1],

[1,1,1,1,-1,-1,-1,-1,-1,-1,-1,-1,1,1,1,1]]

f13 = [[-1,-1,-1,-1,1,1,1,1,-1,-1,-1,-1,1,1,1,1],

[1,1,1,1,-1,-1,-1,-1,1,1,1,1,-1,-1,-1,-1],

[1,1,1,1,-1,-1,-1,-1,1,1,1,1,-1,-1,-1,-1],

[-1,-1,-1,-1,1,1,1,1,-1,-1,-1,-1,1,1,1,1]]

# 4 строка

f10 = [[-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1,-1],

[1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1]]

f12 = [[1,1,1,1,1,1,1,1,-1,-1,-1,-1,-1,-1,-1,-1],

[-1,-1,-1,-1,-1,-1,-1,-1,1,1,1,1,1,1,1,1]]

f14 = [[1,1,1,1,-1,-1,-1,-1,-1,-1,-1,-1,1,1,1,1],

[-1,-1,-1,-1,1,1,1,1,1,1,1,1,-1,-1,-1,-1]]

f15 = [[-1,-1,-1,-1,1,1,1,1,-1,-1,-1,-1,1,1,1,1],

[1,1,1,1,-1,-1,-1,-1,1,1,1,1,-1,-1,-1,-1]]

printLetter(myLetter)

print("mu(f0) = ", firstLine(f0,myLetter))

print("mu(f1) = ", firstLine(f1,myLetter))

print("mu(f2) = ", secondLine(f2,myLetter))

print("mu(f3) = ", secondLine(f3,myLetter))

print("mu(f4) = ", firstLine(f4,myLetter))

print("mu(f5) = ", thirdLine(f5,myLetter))

print("mu(f6) = ", secondLine(f6,myLetter))

print("mu(f7) = ", thirdLine(f7,myLetter))

print("mu(f8) = ", thirdLine(f8,myLetter))

print("mu(f9) = ", firstLine(f9,myLetter))

print("mu(f10) = ", fourthLine(f10,myLetter))

print("mu(f11) = ", secondLine(f11,myLetter))

print("mu(f12) = ", fourthLine(f12,myLetter))

print("mu(f13) = ", thirdLine(f13,myLetter))

print("mu(f14) = ", fourthLine(f14,myLetter))

print("mu(f15) = ", fourthLine(f15,myLetter))