**Problem 4**

Def Index(S, low, high):

IF high LESS than low

Return 🡨 -99

IF high EQUAL low AND S[low] EQUAL 0

Return 🡨 low

ELIF high EQUAL low AND S[low] NOT EQUAL 0

Return 🡨 -99

middle 🡨 floor{ low + (high -low) / 2 }

IF middle EQUAL 0 AND S[middle] EQUAL 0:

Return 🡨 mid

ELIF S[middle - 1] EQUAL 1 AND S[middle] EQUAL 0

Return 🡨 mid

ELIF S[middle] NOT EQUAL 0:

Return 🡨 Index(S, middle+1, high)

ELSE:

Return 🡨 Index(S, low, middle-1)

K 🡨 length of S

Def NumberOfZeroes(S, k):

index 🡨 Index(S, 0, k-1)

IF index EQUAL -99

Return 🡨 0

ELSE:

Return 🡨 (k – index)