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)