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| Batch | A6B3 |

def optimal\_bst(p, q, n):

e = [[0 for \_ in range(n + 1)] for \_ in range(n + 1)]

w = [[0 for \_ in range(n + 1)] for \_ in range(n + 1)]

for i in range(n + 1):

e[i][i] = q[i]

w[i][i] = q[i]

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

for i in range(n - l + 1):

j = i + l

e[i][j] = float('inf')

w[i][j] = w[i][j - 1] + p[j - 1] + q[j]

for r in range(i + 1, j + 1):

t = e[i][r - 1] + e[r][j] + w[i][j]

if t < e[i][j]:

e[i][j] = t

return e[0][n]

n = int(input("Enter number of book IDs: "))

keys = list(map(int, input("Enter sorted book IDs: ").split()))

p = list(map(float, input("Enter probabilities of successful searches (p[i]): ").split()))

q = list(map(float, input("Enter probabilities of unsuccessful searches (q[i]): ").split()))

min\_cost = optimal\_bst(p, q, n)

print(f"Minimum expected cost of OBST = {min\_cost:.4f}")



