In order to explain the solution, we define w_i to be the weight of a random edge i. We aim to solve the following subproblem: What is the maximum total weight possible for a path of length k if the last edge in the path is edge i? The recursion is:

$opt(k, i) = \max\{opt(k-1, j) + w_i$: over edge j pointing to node v_i that edge i points from $\}$.

The final solution of the problem is $\max\{opt(K, i)$: i can be any edge in graph $G\}$.