Funny Cost

To find the best matching, we can use the following greedy algorithm:

Pick the largest edge, note that this edge should be present in the maximum number of pairs. It means that if the index of this edge is i, you should pick the maximum number of pairs (l, r) with $l \in [1 \dots i)$, $r \in [i \dots n)$. Then, you need to add $a_i \cdot \min((i-l), (n-i))$ to the answer and proceed recursively to the problem "find the maximum weight of k pairs inside the segment" for the larger segment.

From this algorithm it is trivial that for the fixed length n, for the i-th element in the sorted order there is a coefficient b_i, and the answer for any array $a_1 \geq a_2 \geq \ldots \geq a_n$ is equal to $\sum a_i \cdot b_i$.

You can investigate the algorithm below to prove that b_i is equal to $(\frac{n}{2}!)^2 \cdot \binom{n-i-2}{\frac{n}{2}-1}$.