$$\sum_{i=1}^{N-1}\sum_{j=0}^{i-1}(A_i - A_j)^2 = \sum_{i=1}^{N-1}\sum_{j=0}^{i-1}(A_i^2 - 2A_iA_j + A_j^2)$$
$$= \sum_{i=1}^{N-1}(i * A_i^2 - 2A_i\sum_{j=0}^{i-1}A_j + \sum_{j=0}^{i-1}A_j^2)$$

$$dp_{i-1} = dp_i + \frac{n}{i-1}$$