8 Exercises – Multiple sequence alignment

1. **SP score**

   The SP (sum-of-pairs) score is used to evaluate multiple sequence alignments.

$$S(\mathcal{A}) = \sum_{i=1}^{m-1} \sum_{j=i+1}^{m} S(\bar{s}^i, \bar{s}^j)$$

   Use the simple scoring scheme and the alignment $\mathcal{A}$ to answer the following questions.

   Alignment $\mathcal{A}$:

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Seq1: A-G
Seq2: GCG
Seq3: G-T
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   Scoring scheme:
   $R_{ab} = 1$ for a = b
   $R_{ab} = 0$ for a $\neq$ b
   g = 1

   N.B. The score of a column with two blanks in a pairwise alignment should be 0.

   (a) Calculate the pairwise score $S(\bar{s}^1, \bar{s}^2)$.

   Solution: 0

   (b) Calculate the pairwise score $S(\bar{s}^1, \bar{s}^3)$.

   Solution: 0

   (c) Calculate the pairwise score $S(\bar{s}^2, \bar{s}^3)$.

   Solution: 0

   (d) Calculate the SP score $S(\mathcal{A})$.

   Solution: $0 + 0 + 0 = 0$