1. The following gaps have to be encoded: 3 512 5
   (a) VB code:
      10000011 00000100 10000000 10000101
   (b) Gamma code:
      101 111111110000000000 11001

2. Computing rank of document 1 (inner product of both vectors):
   \[ q \cdot d_1 = 0 \times 2 + 0 \times 0 + 0 \times 1 + 3 \times 2 + 0 \times 0 + 4 \times 0 = 6 \]

   Computing rank of document 2 (inner product of both vectors):
   \[ q \cdot d_2 = 0 \times 0 + 0 \times 3 + 0 \times 2 + 3 \times 1 + 0 \times 1 + 4 \times 1 = 7 \]

   Computing the length of document 1:
   \[ \sqrt{d_1 \cdot d_1} = \sqrt{2 \times 2 + 0 \times 0 + 1 \times 1 + 2 \times 2 + 0 \times 0 + 0 \times 0} = \sqrt{7} = 3 \]

   Computing the length of document 2:
   \[ \sqrt{d_2 \cdot d_2} = \sqrt{0 \times 0 + 3 \times 3 + 2 \times 2 + 1 \times 1 + 1 \times 1 + 1 \times 1} = \sqrt{16} = 4 \]

   Computing the length of the query:
   \[ \sqrt{q \cdot q} = \sqrt{0 \times 0 + 0 \times 0 + 0 \times 0 + 3 \times 3 + 4 \times 4 + 0 \times 0} = \sqrt{25} = 5 \]

   So \( \text{Rank}(d_1) = \frac{6}{3 \times 3} = 0.40 \) and \( \text{Rank}(d_2) = \frac{7}{3 \times 4} = 0.35 \); therefore document 1 will be listed before document 2.