



Problem:

Calculate the sum:

$$\left(\frac{1+2}{3} + \frac{4+5}{6} + \frac{7+8}{9} + \cdots + \frac{2017+2018}{2019}\right) + \left(1 + \frac{1}{2} + \frac{1}{3} + \cdots + \frac{1}{673}\right).$$

Solution:

$$\begin{aligned} A &= \left(\frac{1+2}{3} + \frac{4+5}{6} + \frac{7+8}{9} + \cdots + \frac{2017+2018}{2019}\right) + \left(1 + \frac{1}{2} + \frac{1}{3} + \cdots + \frac{1}{673}\right) = \\ &= \sum_{k=1}^{673} \frac{(3k-2) + (3k-1)}{3k} + \sum_{k=1}^{673} \frac{1}{k} = \sum_{k=1}^{673} \left(\frac{6k}{3k} - \frac{3}{3k} + \frac{1}{k}\right) = \sum_{k=1}^{673} \left(2 - \frac{1}{k} + \frac{1}{k}\right) = 2 \cdot 673 = 1346. \end{aligned}$$

Answer: 1346.