

$$S = 1 + 2 + 3 + 4 + \dots + 1000$$

$$S = 1000 + 999 + 998 + \dots + 1$$

$$2S = 1001 + 1001 + 1001 + \dots + 1001$$

$$S = \frac{1000 \times 1001}{2} = 500 \times 1001$$

$$500 \times 1001 = 500 \times 1000 + 500 \times 1$$

$$= 500000 + 500$$

$$= 500500$$

$$\therefore 1 + 2 + 3 + \dots + 1000 = 500500$$