

**Task.** Your grandparents gave you a gift of 2000 on your 16th birth day. You want to invest the money in an account over four years. You have an option of investing the 2000 at 8% per annum simple interest or 8% per annum compound interest. Determine, through calculations, which investment will be more profitable.

**Solution.** Let  $P = 2000$  be the initial amount of money (principal),  $r = 0.08$  the interest rate, and  $n = 4$  number of years. Then the amount of money in  $n$  years with simple interest per annum at rate  $r$  is given by the formula:

$$A_1 = P(1 + rn) = 2000 * (1 + 0.08 * 4) = 2640.$$

On the other hand, compound interest with the same  $P$ ,  $r$  and  $n$  is equal to

$$A_2 = A(1 + r)^n = 2000 * (1 + 0.08)^4 \approx 2721.0 > A_1 = 2640.$$

Hence the investment with compound interest per annum is more profitable.

**Answer.** The investment with compound interest per annum is more profitable.