Problem 2 : Determine $T(n)$ & Big-O.

(a) There are 3 ifs, but the first 2 are exclusive:

- total = 1 → 1 op.
- $n > 0$ → 1 op
- $i > 1$: last iteration → 1 op.
- $i = n$: → 1 op.
- $i > 1$, $i--$: → $2n$.
- total = total * i : → n.

⇒ $T_1(n) = 3n + 4$

The last if :

- $n \% 2 == 0$ → 1 op.
- $i = 0$ → 1 op.
- $i < n$ (last iteration) → 1 op.
- $i < n$, $n += 2$: $\frac{n}{2}(2)$ op.
- total = total + i. → $\frac{n}{2}$ op.

⇒ $T_2(n) = 3 + n + \frac{n}{2}$

→ $\boxed{T(n) = T_1(n) + T_2(n) = 7 + 4n + \frac{n}{2}}$ ⇒ $\boxed{O(T(n)) = O(n)}$