481 (research) If we ignore time, then

$$x:= 3.\ \ y:= 4 \ \ = \ \ x:= 3 \parallel y:= 4$$

Some sequential compositions could be executed concurrently if we ignore time. But the time for $P.Q$ is the sum of the times for $P$ and $Q$ , and that forces the execution to be sequential.

$$t:= t+1.\ \ t:= t+2 \ \ = \ \ t:= t+3$$

Likewise some concurrent compositions could be executed sequentially, ignoring time. But the time for $P \| Q$ is the maximum of the times for $P$ and $Q$ , and that forces the execution to be concurrent.

$$t:= t+1 \parallel t:= t+2 \ \ = \ \ t:= t+2$$

Invent another form of composition, intermediate between sequential and concurrent composition, whose execution is sequential to the extent necessary, and concurrent to the extent possible.

After trying the question, scroll down to the solution attempt.

§ We need a symbol for this kind of composition; let's say ★ with the same precedence as $\|$. Suppose the variables are $x$ and $y$, plus time $t$. Suppose time is measured as assignment count. We want to define ★ such that

$$x{:=}\ 2 \bigstar y{:=}\ 3 \;=\; x{:=}\ 2 \,\|\, y{:=}\ 3 \;=\; x'{=}2 \land y'{=}3 \land t'{=}t{+}1$$

$$x{:=}\ 2 \bigstar x{:=}\ 3 \;=\; x{:=}\ 2.\ x{:=}\ 3 \;=\; x'{=}3 \land y'{=}y \land t'{=}t{+}2$$

If you figure out how to do that, please let me know.