

2.3 Dataflow Computation

Petri nets can be used to represent not only the flow of control but also the flow of data. The net shown in Fig. 2.7 is a Petri net representation of a dataflow computation. A dataflow computer is one in which instructions are enabled for execution by the arrival of their operands, and may be executed concurrently. In the Petri net representation of a dataflow computation, tokens denote the values of current data as well as the availability of data. In the net shown in Fig. 2.7, the instructions represented by transitions t_1 and t_2 can be executed concurrently and deposit the resulting data $(a + b)$ and $(a - b)$ in the respective output places.

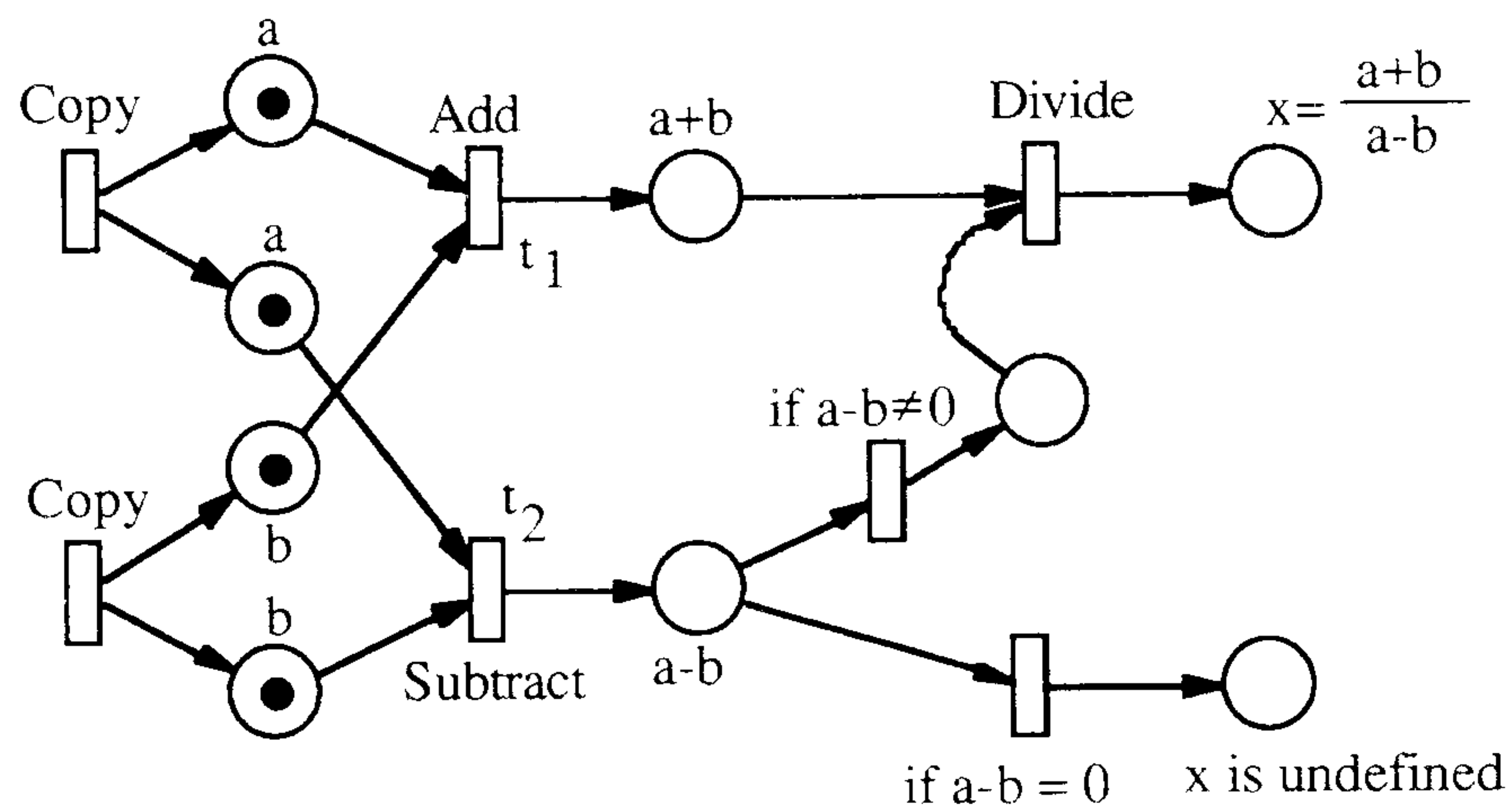


Fig.2.7. A Petri net showing a dataflow computation for $x = (a + b)/(a - b)$.

2.4 Communication Protocols

Communication protocols are another area where Petri nets can be used to represent and specify essential features of a system. The liveness and safeness properties (see Chapter 3) of a Petri net are often used as correctness criteria in communication protocols. The Petri net shown in Fig. 2.8 is a very simple model of a communication protocol between two processes. Fig. 2.9 shows the Petri net representation of a nondeterministic