A transition without any input place is called a *source transition*, and one without any output place is called a *sink transition*. Note that a source transition is unconditionally enabled, and that the firing of a sink transition consumes tokens, but does not produce any.

A pair of a place p and a transition t is called a *self-loop* if p is both an input and output place of t. A Petri net is said to be *pure* if it has no self-loops. A Petri net is said to be *ordinary* if all of its arc weights are one. When there is no arc from p to t (or t to p), we define the default arc weight w(p, t) = 0 (or w(t, p) = 0). It is easy to see that a Petri net has no self-loops iff either w(p, t) or w(t, p) or both are zero, i.e., w(p, t)w(t, p) = 0.

Input Places	Transition	Output Places
Preconditions	Event	Postconditions
Input data	Computation step	Output data
Input signals	Signal processor	Output signals
Resources needed	Task or job	Resources released
Conditions	Clause in logic	Conclusion(s)
Buffers	Processor	Buffers

Table 1 Some Typical Interpretations of Transitions and Places

A Petri net is a 5-tuple, $PN = (P, T, F, W, M_0)$ where:

$P = \{p_1, p_2, ..., p_m\}$ is a finite set of places,

$T = \{t_1, t_2, ..., t_n\}$ is a finite set of transitions,

$F \subseteq (P \times T) \cup (T \times P)$ is a set of arcs (flow relation),

$W: F \rightarrow \{1, 2, 3, ...\}$ is a weight function with $W(a) = 0$ for $a \notin F$,

M_0: P $\rightarrow \{0, 1, 2, 3, ...\}$ is the initial marking,

$P \cap T = \emptyset$ and $P \cup T \neq \emptyset$.

A Petri net structure $N = (P, T, F, W)$ without any specific initial marking is denoted by N.

A Petri net with given initial marking is denoted by (N, M_0).

Table 2 Formal Definition of a Petri Net