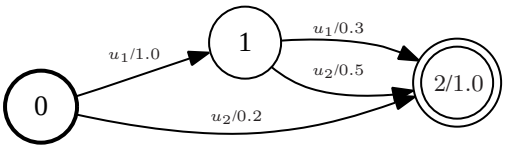
# Weighted Path Counting Transducers Example[1]




| Hypothesis | $p(E\|F)$ |
|---|---|
| $E_1 = u_1u_2$ | 0.5 |
| $E_2 = u_1u_1$ | 0.3 |
| $E_3 = u_2$ | 0.2 |

| Method | $u_1$ | $u_2$ |
|---|---|---|
| $c(u\|\mathcal{E})$ | 1.1 | 0.7 |
| $p(u\|\mathcal{E})$ | 0.8 | 0.7 |

Figure 1: Toy lattice $\mathcal{E}_n$ encoding three order $n$ hypothesis sequences: $E_1 = u_1u_2$, $E_2 = u_1u_1$, and $E_3 = u_2$.

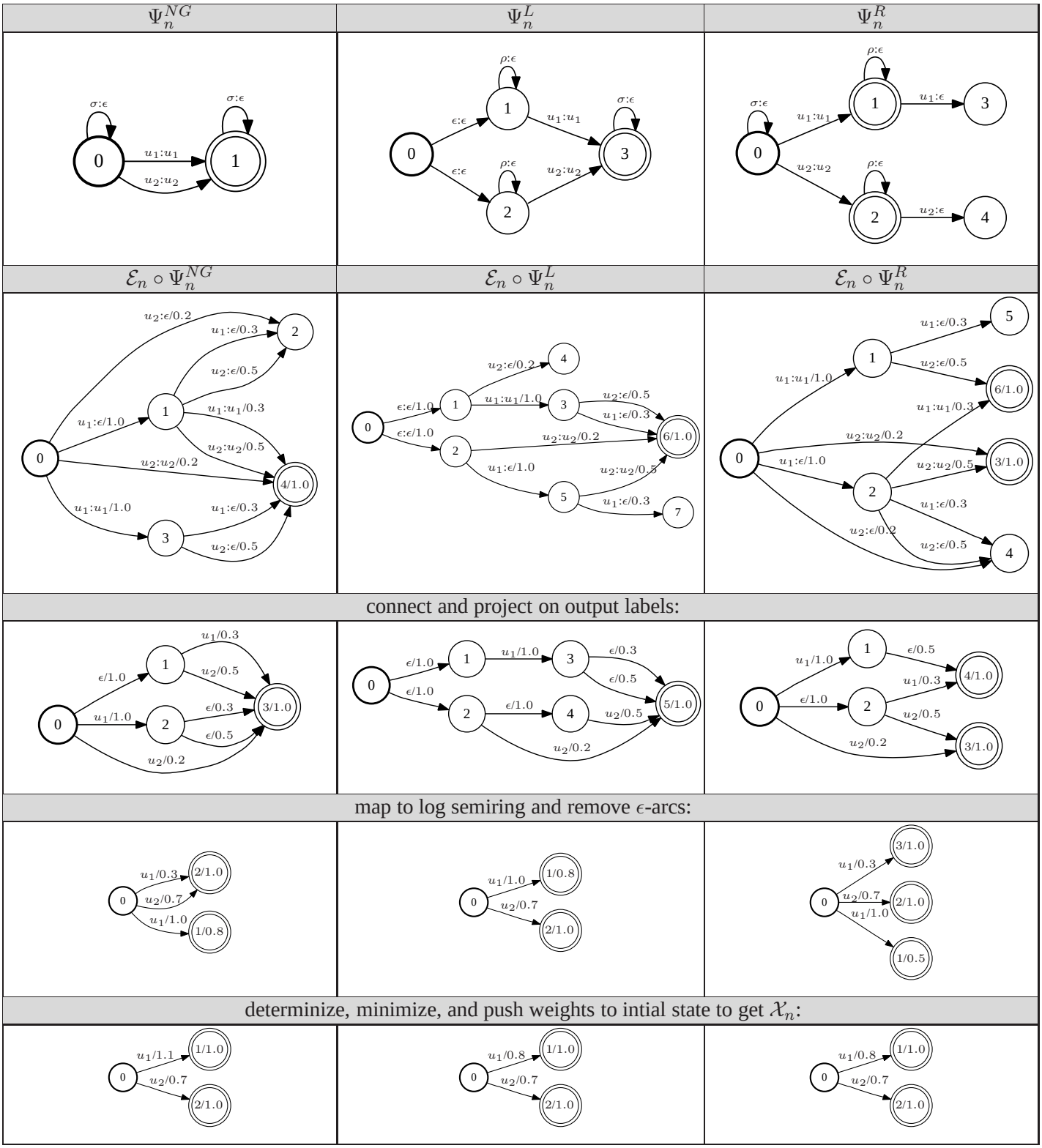



Figure 2: Weighted counting operations for $n$-gram counting transducer $\Psi_n^{NG}$, and left-most $\Psi_n^L$ and right-most $\Psi_n^R$ path-counting transducers. Costs of arcs and final states in all weighted automata are shown for the real $(+, \times)$ semiring.

[1]Blackwood, G., de Gispert, A., and Byrne, W. (2010). *Efficient path counting transducers for minimum Bayes-risk decoding of statistical machine translation lattices.* In Proceedings of the 48th Annual Meeting of the Association for Computational Linguistics (ACL 2010).