Turing machines

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***Abstract*—The Turing machine is a conceptual model of computation. Originally defined in Alan Turing's 1936 paper *On computable numbers with an application to the entscheidungsproblem*.**

I. Definitions

A Turing machine is a 7-tuple $(Q, \Sigma, \Gamma, \delta, q_0, q_a, q_f)$ where: Q is a set of states; Σ is the input alphabet, not containing the blank symbol $\sqcup$; Γ is the tape alphabet, a superset of Σ containing $\sqcup$; δ is a map from $Q \times \Gamma$ to $\Gamma \times \{L, R, S\} \times Q$; q_0 is the initial states; q_a is the accept state; q_f is the reject state.