

Problem 2

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Each of I, H, X, Y, Z, CNOT and TOF is a quantum circuit expression, and therefore terminals.

$S \rightarrow I \mid H \mid X \mid Y \mid Z \mid \text{CNOT} \mid \text{TOF}$

$S \rightarrow \epsilon$

$S \rightarrow (S)$

$S \rightarrow S * S$

$S \rightarrow S \otimes S$

Note that ϵ represents empty string (epsilon)