DTM - Deterministic Turing Machine running in polynomial time
NTM - Non-deterministic Turing Machine running in polynomial time
PT - Probabilistic Turing Machine running in polynomial time

Probabilistic Complexity Classes

$$P = \{A \in \Sigma^* \mid \exists\, \text{DTM } T : \quad \forall x \in A : \mathrm{P}(T(x) = 1) = 1 \,\wedge$$
$$\forall x \notin A : \mathrm{P}(T(x) = 1) = 0 \,\}$$

$$NP = \{A \in \Sigma^* \mid \exists\, \text{NTM } T : \quad \forall x \in A : \mathrm{P}(T(x) = 1) > 0 \,\wedge$$
$$\forall x \notin A : \mathrm{P}(T(x) = 1) = 0 \,\}$$

$$PP = \{A \in \Sigma^* \mid \exists\, \text{PT } T : \quad \forall x \in A : \mathrm{P}(T(x) = 1) > 0.5 \,\wedge$$
$$\forall x \notin A : \mathrm{P}(T(x) = 1) \leq 0.5 \,\}$$

$$BPP = \{A \in \Sigma^* \mid \exists\, \text{PT } T : \quad \forall x \in A : \mathrm{P}(T(x) = 1) > 0.5 + \epsilon \,\wedge$$
$$\forall x \notin A : \mathrm{P}(T(x) = 1) \leq 0.5 - \epsilon \,\}$$

$$RP = \{A \in \Sigma^* \mid \exists\, \text{PT } T : \quad \forall x \in A : \mathrm{P}(T(x) = 1) > 0.5 \,\wedge$$
$$\forall x \notin A : \mathrm{P}(T(x) = 1) = 0 \,\}$$

$$ZPP = \{A \in \Sigma^* \mid \exists\, \text{PT } T : \quad \forall x \in A : \mathrm{P}(T(x) = 1) > 0.5 \,\wedge$$
$$\mathrm{P}(T(x) = ?\,) < 0.5 \,\wedge$$
$$\forall x \notin A : \mathrm{P}(T(x) = 1) = 0 \,\wedge$$
$$\mathrm{P}(T(x) = ?\,) < 0.5 \,\}$$