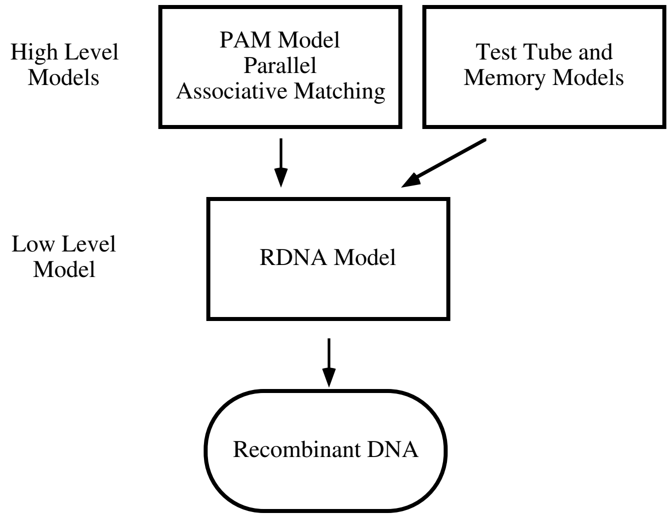

Figure 0. Molecular Model Simulation Results

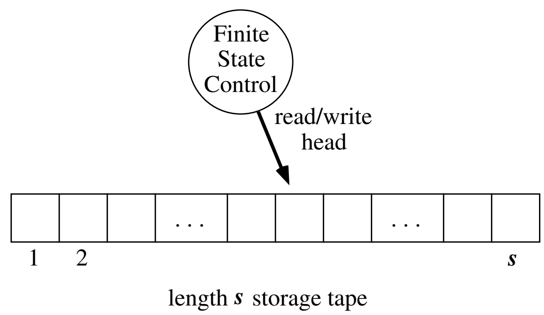

Figure 1. A Turing Machine with space bound s

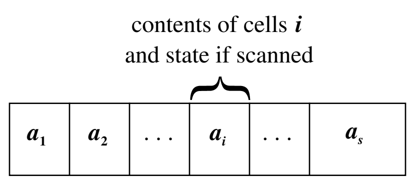

Figure 2. Encoding of the configuration of a Turing Machine.

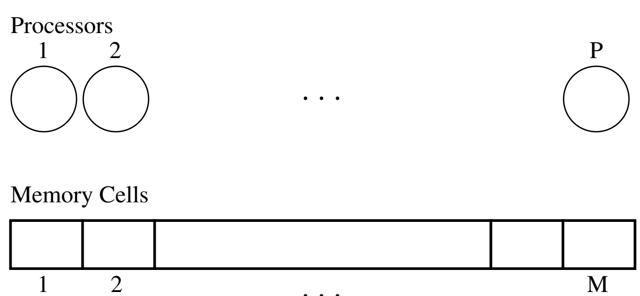

Figure 3. A Parallel RAM.

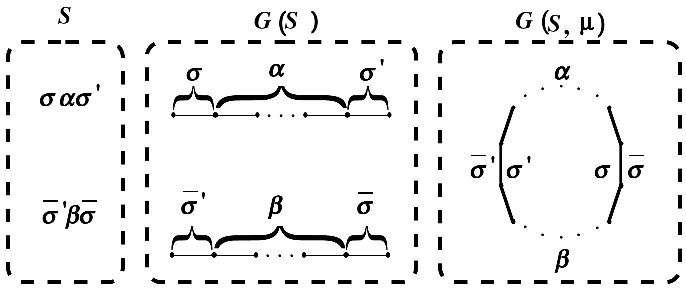

Figure 4. Example of a set of strings $S=\{\sigma\alpha\sigma', \bar{\sigma}'\beta\bar{\sigma}\}$, and the digraphs $G(S)$, $G(S, \mu)$

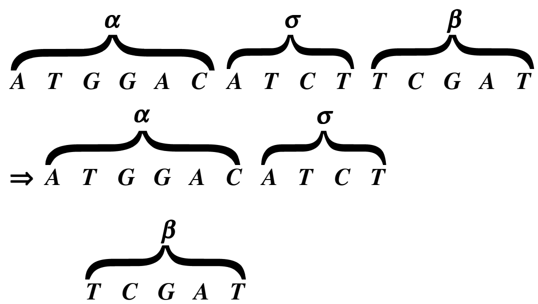

Figure 5. Cleavage of the DNA strand $\alpha\sigma\beta$ just after the sequence $\sigma = ATCT$, resulting in two disconnected strands $\alpha\sigma$ and β.

Example contents of the test tubes used to implement the PA Match Operation;
all are single stranded strings or single stranded simple loops.

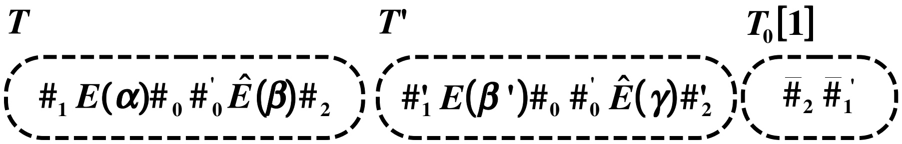

Figure 6.0. Example contents of the initial test tubes T, T',and $T_0[1]$.

$$T_1 \qquad \#_1 E(\alpha)\#_0 \#'_0 \hat{E}(\beta)\#_2 \#'_1 E(\beta')\#_0 \#'_0 \hat{E}(\gamma)\#'_2$$

Figure 6.1. Example contents of test tube T_1.

$$T_2 \qquad \#_1 E(\alpha)\#_0 \#'_0 \hat{E}(\beta)\#_2 \#'_1 E(\beta)\#_0 \#'_0 \hat{E}(\gamma)\#'_2$$

Figure 6.2. Example contents of test tube T_2.

T_3

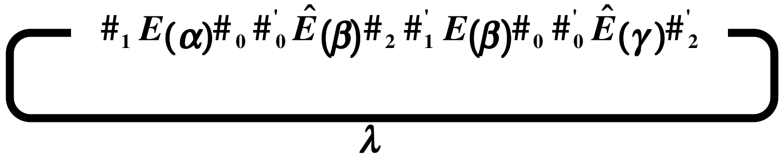

Figure 6.3. Example contents of the test tube T_3.

$$T_4 \qquad \#'_0 \hat{E}(\alpha)\#'_2 \lambda \#_1 \hat{E}(\gamma)\#_0$$

Figure 6.4. Example contents of the test tube T_4.

T_5

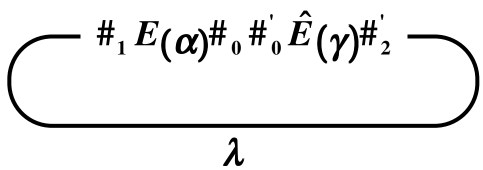

Figure 6.5. Example contents of test tube T_5.

$$T_6 \qquad \#_1 E(\alpha)\#_0 \#'_0 \hat{E}(\gamma)\#'_2$$

Figure 6.6. Example contents of the final test tube $T_6 = T \circ T'$.

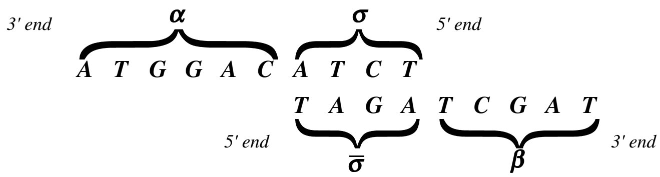

Figure 7. Two single DNA strands $\boldsymbol{\alpha\sigma}$ (oriented 3'-5') and $\boldsymbol{\bar{\sigma}\beta}$ (oriented 5'-3') joined at Watson-Crick complementary sequences $\boldsymbol{\sigma = ATCT}$, $\boldsymbol{\bar{\sigma} = TAGA}$ to form a partial double strand of DNA where $\boldsymbol{\alpha = ATGGAC}$, $\boldsymbol{\beta = TCGAT}$.

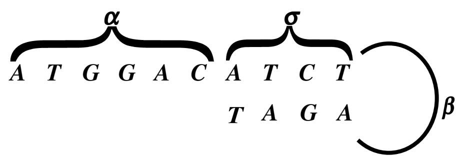

Figure 8. A segment of DNA with a loop resulting from a degenerate single strand $\boldsymbol{\alpha\sigma\beta\,\bar{\sigma}^R}$ with complementary substrings $\boldsymbol{\sigma, \bar{\sigma}}$.

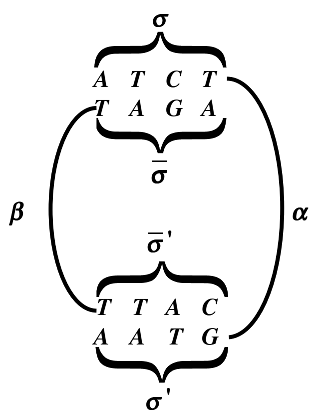

Figure 9. Two single DNA strands $\boldsymbol{\sigma\alpha\sigma'}$ (oriented 3'-5') and $\boldsymbol{\bar{\sigma}'\beta\bar{\sigma}}$ (oriented 5'-3') joined at two pairs of Watson-Crick complementary sequences: $\boldsymbol{\sigma = ATCT}$, $\boldsymbol{\bar{\sigma} = TAGA}$, and also $\boldsymbol{\sigma' = GTAA}$, $\boldsymbol{\bar{\sigma}' = CATT}$, to form a cyclic strand of DNA.