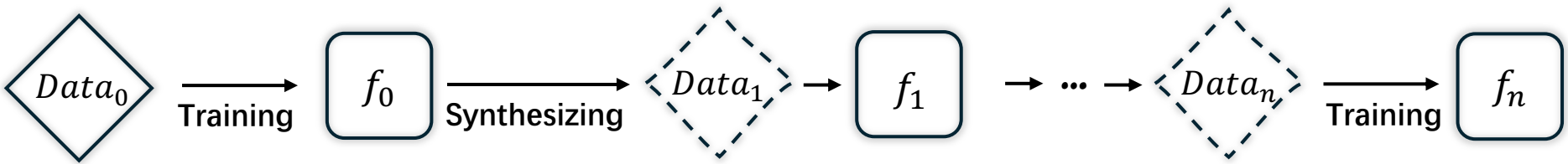
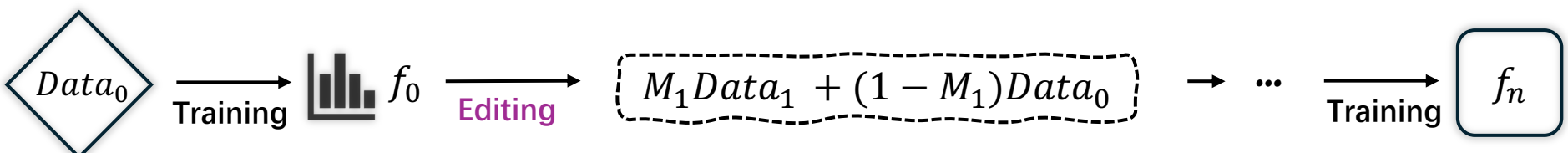
① Model Collapse Setting ⇢ $\boldsymbol{E_{test}} = \frac{\boldsymbol{\sigma^2 d}}{\boldsymbol{T-d-1}} \times \boldsymbol{n}$



② Token-Level Editing ⇢ $\boldsymbol{E_{test}} \leq \frac{\boldsymbol{\sigma^2 d}}{\boldsymbol{T-d-1}} \times \boldsymbol{2}$ ⇢ Avoiding Model Collapse



Trained Model f_i

Source Real Data: $Data_0$

Synthetic Data: $Data_{>0}$

Iterations $i \in \{1, \ldots, n\}$

Test Error E_{test}

Data Size T

Input Dimensions d

Label Noise Scalar σ

Editing Operation Matrix M_i