Algorithm 1 Nyström-Approximated Primal SVM Framework

Input Training data with labels $(\boldsymbol{y}, X)$. A kernel function K. A number s, the total size of the bases. (Optional)

Predefined A basis selection algorithm $\mathcal{A}(\boldsymbol{y}, X, K, s)$.

1. Get $B \leftarrow \mathcal{A}(\boldsymbol{y}, X, K, s)$
2. Compute $R \leftarrow$ Cholesky decomposition of $K(B, B)$
3. Compute $\bar{X} \leftarrow K(X, B)R^{-1}$
4. Learn a linear SVM model $\mathcal{M}$ from $\bar{X}$ and $\boldsymbol{y}$

Return $\mathcal{M}$