Algorithm 2 Query CTI_SyscallSynonymBase

Input   TargetSent   /* a sentence segment in CTI document which
                               contains STobj */
            STobj   /* a STobj represent the word mapping a STregex
                               from ASG */

Output MatchedSyscalls [] /* the descriptive verb in sentence may match 0
                                    or more system calls (1-D array) */

/* Get the descriptive verb of ST_{obj}, return if not found */
nlp   ← denpency_parse(*TargetSent*, *STobj*)
verb ← find_subject_verb(*nlp*, *STobj*)
if *verb* is None **then**
        return empty list []
end if

/* If the descriptive verb is in SynonymBase, get the correspondence system
calls base on the verb and object type */
Initialize *SynonymList* [] ← load_synonym_base()
entityType ← classify_object_entity(*STobj*)
if *verb* ∈ query_all_verbs(*SynonymList*) **then**
        return query_mapped_syscall(*SynonymList*, *verb*, *entityType*)
end if

/* If the descriptive verb is not included, get a alternative verb from
SynonymBase with most similar word embedding */
/* Continue the correspondence syscall lookup process same as above */
wv ← bert_embedding(*TargetSent*, *verb*)
alternativeVerb ← query_nearest_verb(*SynonymList*, *wv*, *entityType*)
return query_mapped_syscall(*SynonymList*, *altVerb*, *entityType*)