**Prolog Sorting Report**

317203 Cairong Yang

**Task:**

In this lab 3 kinds of sorting algorithm will be implemented by prolog including insert sort, bubble sort, merge sort.

The environment used in this lab is SWI-Prolog(AMD64,Multi-threaded,version 8.4.0).

**1.Insert sort:**

**1.1 Code**

Text

Description automatically generated

**1.2 Description:**

The“i\_sort” predicate indicates inserting the first item into the accumulate result during recursive sorting. If adding the empty element to the accumulate result it will still be the accumulate result. When insert the non-null head element to the accumulate sub-result “insert” predicate will judge which location the head element will be in the accumulate sub-result. From the tail list each element will be successively picked and execute the recursive inserting action perceptively as well.

**1.3 The test case & result:**

Text, letter

Description automatically generated

**2. Bubble sort**

**2.1 Code**

Text

Description automatically generated

**2.2 Description:**

The ”b\_sort” predicate indicates comparing adjacent elements to find the max element, 2nd ,3rd,4th… greater element each time during the recursive sorting beyond the accumulating result.

The “bubble” predicate compare the head element with the first element of the tail sorting them ascending and each pair of the rest adjacent elements of the tail will accumulate comparing till all the element has be compared for one loop the max element will be found. Execute the recursive comparing for the number of the elements minus one times till all the elements is sorted.

**2.3 The test case & result:**

Text, letter

Description automatically generated

**3. Merge sort**

**3.1 Code**

Text, letter

Description automatically generated

**3.2 Description:**

The “halve” predicate indicates dividing a list into two sub list for both even elements and odd elements.

The “merge\_sort” predicate indicates for empty list and single element it’s already sorted, more than two elements list will be divided into two sub list, and sort them respectively by the recursive way, at last merge the result into sorted one.

The “merge” predicate will merge two sorted list in ascending order.

**3.3 The test case & result:**

Text

Description automatically generated