

# CSCI335 Project

1. Binary insertion sort uses binary search to find an appropriate position to insert  $A[i]$  among the previously sorted  $A[0] \leq \dots \leq A[i-1]$ . Give the Pseudocode for binary insertion sort (30%).

**Note: If it is NOT binary insertion sort, you will get 0 credit.**

2. Determine the algorithm's worst-case efficiency class in terms of key comparisons. You must provide an explanation (20%).
3. Use Java to implement **binary insertion sort algorithm** to sort a list of student records containing student's ID, name, age, and GPA. (Use student ID as the sorting key.) (50%)
  - a. Create a **text file** containing **at least 20** students records
  - b. Your program must write sorted records into **another text file**.
  - c. Your program must display student records before and after sorting.
  - d. In your project report (in PDF or MS Word format), include:
    - i. Runnable source codes with comments (30%)
    - ii. Input text file (unsorted) (5%)
    - iii. Output text file (sorted) (5%)
    - iv. A screenshot showing your program running, displaying the records before and after sorting. (10%)

**Note:** \*\*Use binary insertion sort to sort the students' records! If your program does not implement binary insertion sort, you will receive a maximum of 10 points for Part 3, provided the program is runnable and sorts the list correctly.