**Lessons-learn reflecting on the problems**

In the beginning, I put all the data in the primary method. Later, when I did the second assignment, I found some problems. Many data needed to be re-entered before the next step could be performed, which was a waste of time. In the next job, I re factor my data and methods, and there will be a manager associated with the Class to manage the data. The advantage of doing this is that you don't have to re-enter the data, and you use the data in the file to do the calculation. The second thing That I find most interesting is the part of the Scene Builder. I am a student without any computer foundation, and I thought that the design part of the JavaFX needed code to complete. But with Scene Builder, the software is so great that I have to design it, put it directly in the project, and then connect it with a class and add some methods. In the fourth assignment, I used the knowledge of the database, and many statements are the knowledge of the database.

And finally, the part of the algorithm that I spent the longest time on. Recommend uses the state Tree's greedy search. Here, a state is a method of composing teams, where any two students are swapped, and the form of the system changes from one state to another. The status tree is to root the current state and exchange all "reasonable" states of two students as children nodes (this is also called expand a state). Then find the best one in The Children nodes and do the same operation.Since swapping any two students gives a new state, the children of each expansion are the 20 choose two levels of complexity, so we used a strategy to reduce the complexity by swapping the best overall team for the worst, with all students in both teams changing once. In each swap, we only try to switch one student to another team, so that the maximum number of nodes to be expanded each time is 4\*4 = 16.Also, when searching, we stipulate that the state tree should be expanded at most five layers, which significantly reduces the complexity of the algorithm.The algorithm refers to Best First Search, USES priority Queue to sort the expanded status nodes, and selects the best node to extend each time. And remember that the best status node so far is returned after the algorithm is finished.

Through the completion of this assignment, I learned a lot of new things, a good experience, I finished a small project, very happy.