Your agile team is to write an application that stores the given National Basketball Association (NBA) information into an ordered or unordered map (not using the map or unordered map STL or the QT map). The underlying data structure of the map is the choice of the team. The map should store either the arenas and/or the souvenirs. The application will allow basketball fans to plan their dream vacation.

1. Write at least 10 agile stories (including description, tasks, test scenarios, and story points) before any software development.
2. Display all the information related to only one particular Basketball team (team name, arena name, seating capacity, location, conference, division, year the team joined the league, coach). Do not display information related to the other NBA teams.
3. Display the list of the NBA teams sorted by team name.
4. Display the list of NBA arenas and their corresponding team name sorted by arena name.
5. Display the list of only the Eastern Conference teams sorted by team name. The Western Conference teams should not be displayed.
6. Display the list of only the Southeast Eastern division teams of the Eastern conference sorted by team name. No other teams should be displayed.
7. Display the list of NBA coaches and their corresponding team name sorted by team name.
8. Display the list of NBA arenas and their corresponding team names sorted by seating capacity (smallest to largest). Be sure to display seating capacity. Display the total capacity of all NBA teams.
9. Display the list of NBA teams, their arena names, the year they joined the league, sorted by year in ascending order.
10. Display all the souvenirs related to only one particular basketball team.

**Planning a vacation:**

1. Provide the capability for a basketball fan to visit any other team of their choice starting at the Denver Nuggets traveling the shortest distance. Your Agile team should implement *Dijkstra’s* or the A\* algorithm. Display the total distance travelled.
2. Provide the capability for a basketball fan to plan his/her dream vacation by allowing a Basketball fan to choose their starting team and all the other teams they would like to visit using the order specified. Your Agile team should implement *Dijkstra’s* or the A\* algorithm between cities. Display the total distance travelled.
3. Provide the capability to visit the all the teams starting at the Detroit Pistons traveling the shortest distance. Chose the team closest to the Detroit Pistons and then chose the team closes to that team, etc.
   1. Display the total distance traveled
4. Provide the capability for a basketball fan to plan his/her dream vacation by allowing a basketball fan to choose their starting team
   1. Then allow a basketball fan to select other teams they wish to visit
   2. Plan the trip starting with the selected team then visit each of the other teams in the most efficient order (recursively choose the team closest to the previous team)
   3. Display the total distance traveled
5. Determine the minimum spanning tree (MST) connecting all the NBA arenas using Prim’s or Kruskal’s algorithm. Display the associated mileage.
6. Perform a DFS starting at the Orlando Magic. If there is a choice, always choose the shortest distance. Display the associated mileage.
7. Perform a BFS starting at Los Angeles Lakers. If there is a choice, always choose the shortest distance. Display the associated mileage.
8. When taking any trip:
   1. A basketball fan can purchase multiple souvenirs
   2. Your Agile team must keep track of the number of souvenirs purchased at each arena.
   3. Display the total amount spent at each arena and a grand total for all arenas visited
9. Maintenance (administrator only - requires a password to gain access)
   1. Provide the capability to add a new team and its corresponding information by having your program read from an input file given to the class (assume the team has the default souvenirs)
   2. Provide the capability to change the prices of the traditional souvenirs
   3. Provide the capability to add new traditional souvenirs
   4. Provide the capability to delete traditional souvenirs
10. Provide the ability to modify arena information including capacity if a team moves into a new arena. (administrator only) (The Los Angeles Clippers may be planning to move to a new arena in 2022).
11. What is the total seating capacity of the NBA teams?

The initial souvenir list is follows:

1. Autographed Basketball $49.89
2. Team pennant $17.99
3. Team picture $29.99
4. Team jersey $179.79

(Each team needs its own souvenir list so it can be modified)

Please let me know your partners by October 23th (three points will be deducted from your score if you do not meet this deadline). All projects are due by December 9th. **No late projects will be accepted.** Your team must demonstrate your project to me before it will be graded. Each teammate must identify their accomplishments on the project. Not all team members will necessarily earn the same score.

1. Design a very readable, easy to use interface to demonstrate your program.
2. Contingency handling should include addressing invalid input.
3. Team must submit their Agile stories. The team must follow the Scrum process (the Scrum master must document all meetings and the product owner must document the backlog).
4. Submit a UML class diagram, at least three use cases, and at least three state diagrams with your project.
5. Submit a test plan.
6. Identify all data structures used.
7. All changes must be persistent between executions.
8. Submit a discussing the **Big-Oh** of your project for at least **five** methods.
9. Identify all the data structures used.
10. Each team must use a version control system, graphical user interface tool, automated documentation tool, and an Agile management tool. (GITHUB, DOXYGEN, WAFFIO.IO, QT, etc.)
11. All artifacts are due on December 9th.

Schedule:

First checkpoint – November 13th – 4 points

Second checkpoint – November 25th – 4 points

Final checkpoint – December 9th – 42 points

The project will be graded using the following scale:



**Final demonstration meeting**:

1. Be prepared to demonstrate all project’s requirements within the 20 minute timeframe.
2. All team members must be present.
3. Turn in Agile planning poker cards
4. Demonstrate DOXYGEN and Agile management tool
5. Each teammate must identify their accomplishments on the project and assess their teammates via e-mail.
6. Submit all your project artifacts
7. Code, test plan, agile stories, scrum log, coding standards, team rules, UML diagrams (class, use cases, state diagrams, data structures used, Big Oh analysis.