

Take Me Out to the Ballgame

Your agile team is to write an application that stores the given Major League Baseball (MLB) information into an ordered or unordered **map or priority queue** (not using the STL ordered map or unordered map or the QT map). The underlying data structure of the map is the choice of the team. The map should store either the stadiums and/or the souvenirs. The application will allow baseball fans to plan their dream vacation. Write at least 10 agile stories (including description, tasks, test scenarios, and story points) before any software development commences. Develop the following UML documents: a) class diagram b) at least three use cases c) three activity diagram before any software development commences. The UML diagrams should be shown during the Sprint 1 checkpoint.

A list of all major league baseball stadiums resides at http://en.wikipedia.org/wiki/List_of_Major_League_Baseball_stadiums.

1. Display all the information related to only one particular baseball team (Stadium name, Seating capacity, Location, playing surface, Team name, League, Date opened, Distance to center field, Ballpark typology, Roof type). Do not display information related to the other MLB teams.
2. Display the list of all the major league team names and their corresponding stadiums names sorted by team name.
3. Display the list of all the major league team names and their corresponding stadiums names sorted by stadium name.
4. Display the list of American League team names and their corresponding stadiums names sorted by team name.
5. Display the list of National League team names and their corresponding stadiums names sorted by stadium name.
6. Display the list of stadiums and their corresponding team name sorted by park typology. Be sure to display park typology.
7. Display the list of team names that have an open roof type sorted by team name. Display the number of teams with an open roof type.
8. Display the list of stadiums and their corresponding team name in chronological order (oldest to newest) using date opened. Be sure to display date opened.

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9. Display the list of stadiums and their corresponding team names sorted by seating capacity (smallest to largest). Be sure to display seating capacity. Display the total capacity of all major league teams.
10. Display only the stadium(s) and corresponding team name(s) that has the greatest distance to center field.
11. Display only the stadium(s) and corresponding team name(s) that has the smallest distance to center field.

The initial souvenir list is as follows:

a. Baseball cap	\$19.99
b. Baseball bat	\$89.39
c. Team pennant	\$17.99
d. Autographed baseball	\$29.99
e. Team jersey	\$199.99

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

Planning a vacation:

1. Provide the capability for a baseball fan to visit any other team of their choice starting at the Dodger Stadium (Los Angeles Dodger) 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 baseball fan to plan his/her dream vacation by allowing a baseball fan to choose their starting team and all the other teams they would like to visit using the order specified using the shortest path. Display the total distance travelled.
3. Provide the capability to visit the all the teams starting at Marlins Park (Miami Marlins) traveling the shortest distance. Chose the team's stadium closest to Marlins Park and then chose the stadium closest to that stadium, etc.
 - a. Display the total distance traveled

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4. Provide the capability for a baseball fan to plan his/her dream vacation by allowing a baseball fan to choose their starting team
 - a. Then allow a baseball fan to select other teams they wish to visit
 - b. Plan the trip starting with the selected team's stadium then visit each of the other teams' stadium in the most efficient order (recursively choose the team closest to the previous team)
 - c. Display the total distance traveled
5. Determine the minimum spanning tree (MST) connecting all the MLB stadiums using Prim's or Kruskal's algorithm. Display the associated mileage.
6. Perform a DFS starting at Oracle Park (San Francisco Giants). If there is a choice, always choose the shortest distance. Display the associated mileage.
7. Perform a BFS starting at Target Field (Minnesota Twins). If there is a choice, always choose the shortest distance. Display the associated mileage.
8. When taking any trip:
 - a. A baseball fan can purchase multiple souvenirs
 - b. Your Agile team must keep track of the number of souvenirs purchased at each stadium.
 - c. Display the total amount spent at each stadium and a grand total for all stadiums visited
9. Maintenance (administrator only - requires an encrypted password to gain access)
 - a. Provide the capability to add a new stadium and its corresponding souvenirs by having your program read from an input file given to the class
 - b. Provide the capability to change the prices of the traditional souvenirs
 - c. Provide the capability to add new traditional souvenirs
 - d. Provide the capability to delete traditional souvenirs
10. Provide the ability to modify stadium information including capacity, stadium name, playing surface, roof type, ballpark typology, date opened, distance to center field, and location if a team moves into a new stadium. (administrator only) (The

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Oakland Athletics are planning to move to the Oakland Ballpark with a seating capacity of 35,000 in 2025).

Please let me know your partners by March 27th (two points will be deducted from your score if you do not meet this deadline). All projects are due by May 17th. **No late projects or artifacts 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. All changes must be persistent between executions.
5. Submit the following:
 - a. Test Plan
6. Submit the following UML diagrams:
 - a. Three use cases diagrams
 - b. Three activity diagrams
 - c. One class diagram
7. Agile stories, retrospective reports, coding standards and team rules, scrum log
8. Identify all data structures used
9. A **Big-Oh** discussion for at least **five** methods
10. Each team must use a version control system, graphical user interface tool, automated documentation tool, and an Agile management tool. (GITHUB, DOXYGEN, QT, etc.)
11. Everyone must critique their team members.
12. All artifacts are due on May 15th.

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The project will be graded using the following scale:

Description	Value
Checkpoint 1	3
Checkpoint 2	3
Meet requirements	75
Coding Style/Style Guide	1
Use of multiple C++ data structures (1 points per data structure)	3
Test Plan	3
User interface	2
Adherence to Scrum/Team Rules	3
UML	3
DOXYGEN	1
Big O (1 point for each method)	3
Total	100
Continuous Integration (extra credit)	3
Total with extra credit	103

Schedule:

First checkpoint – April 17th

Second checkpoint – May 1st

Final checkpoint – May 15th