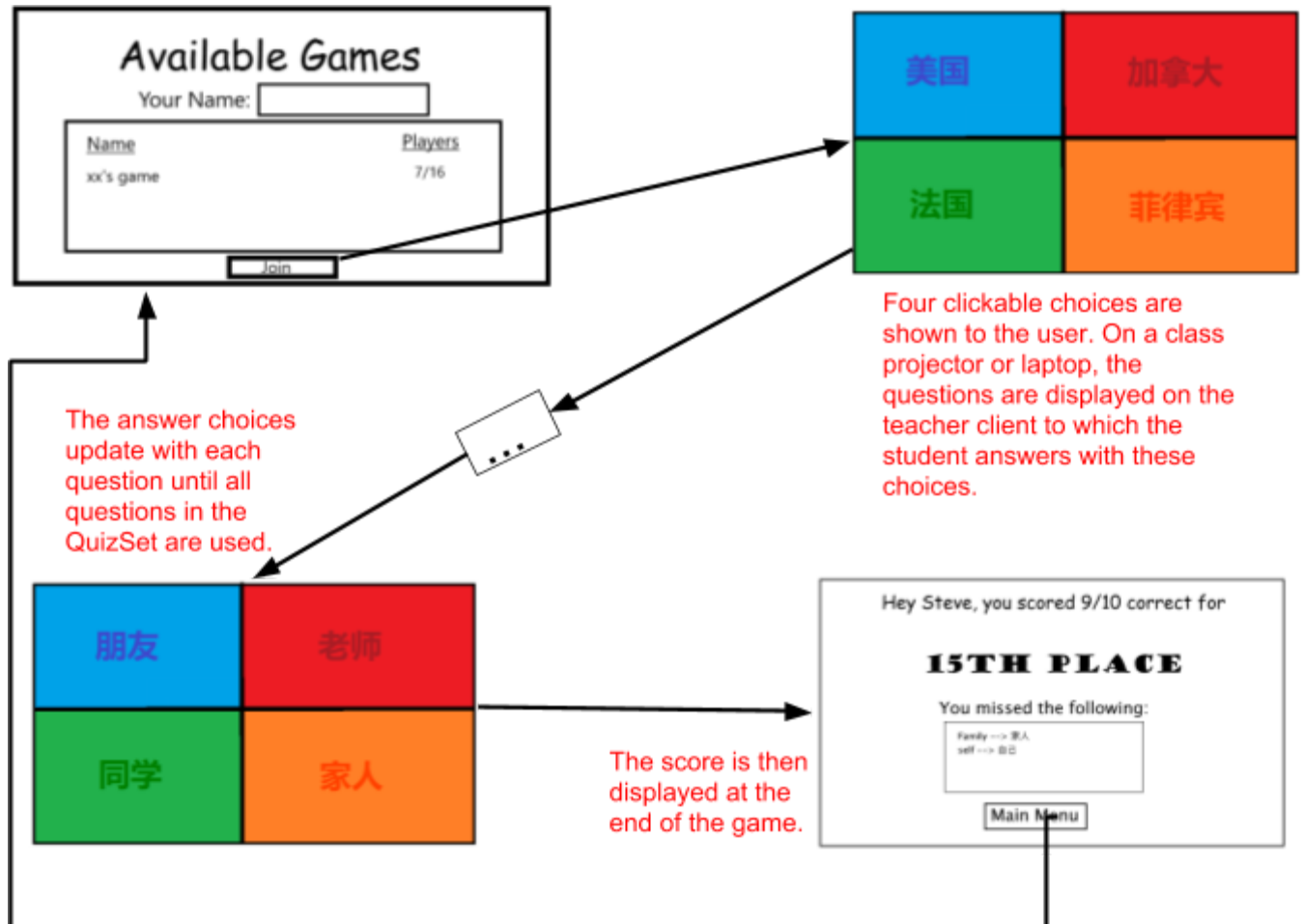
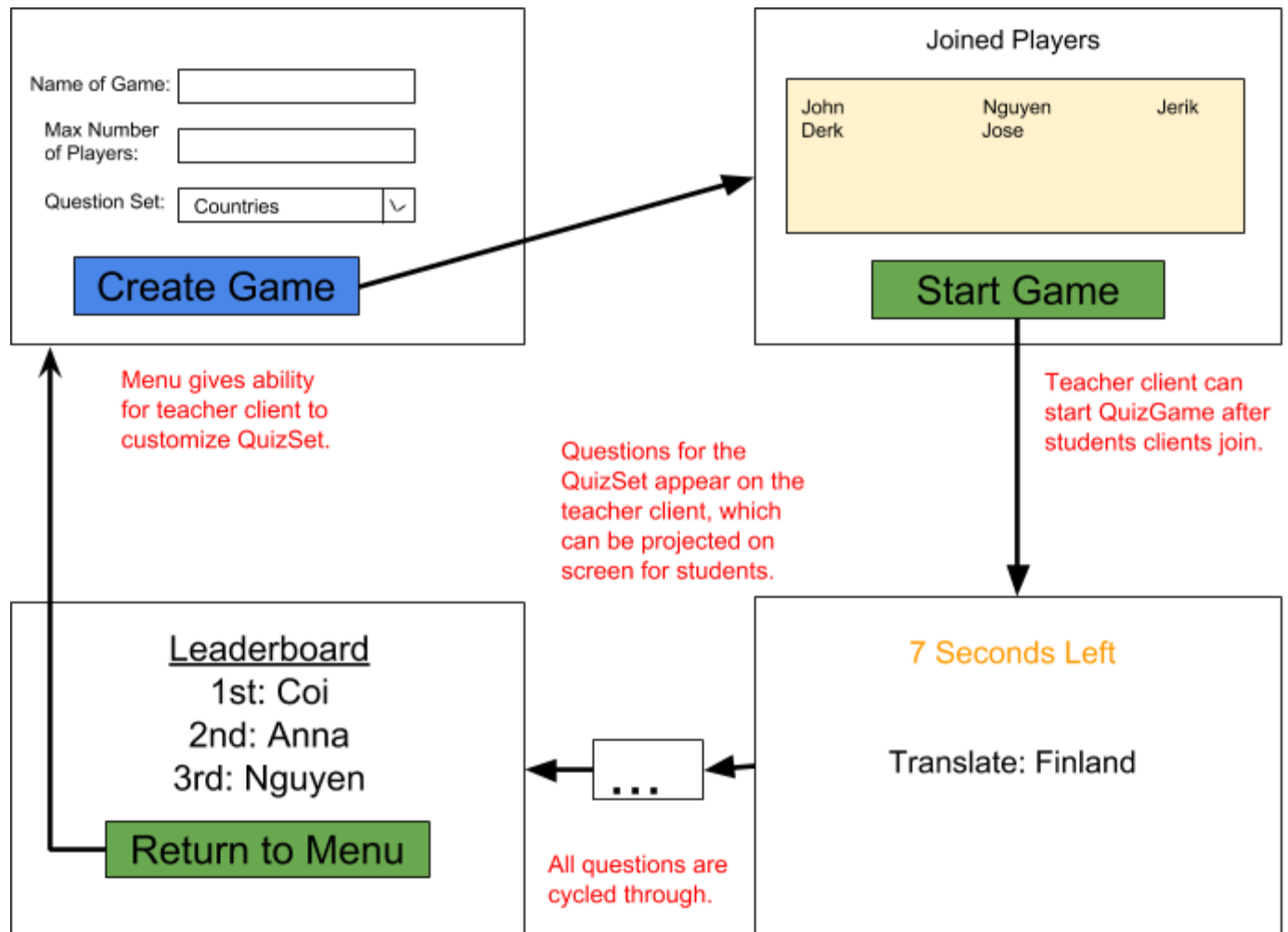


Criterion B: Design

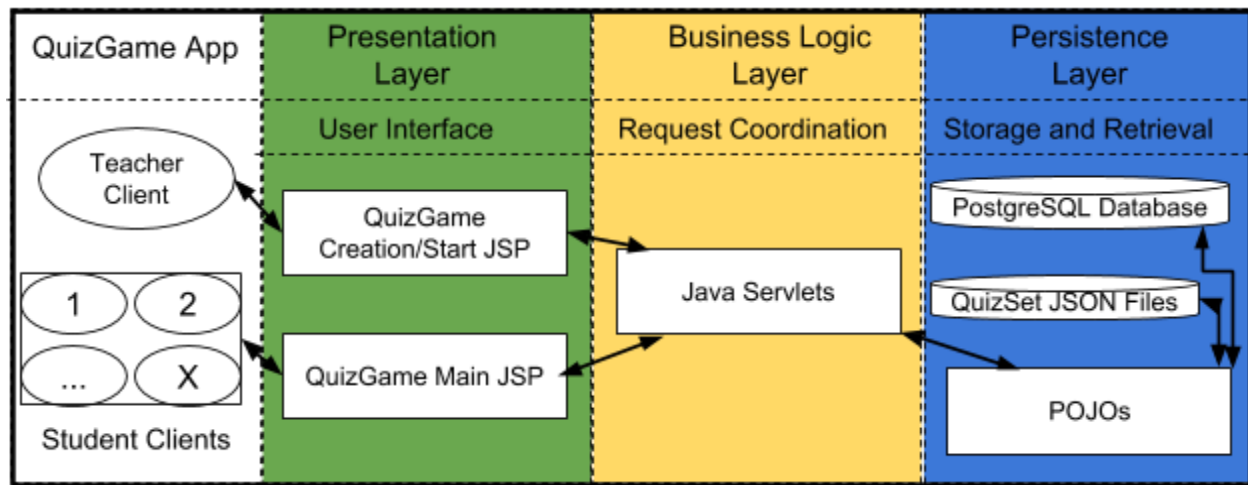
Student Prototype



Teacher Prototype



Application Architecture

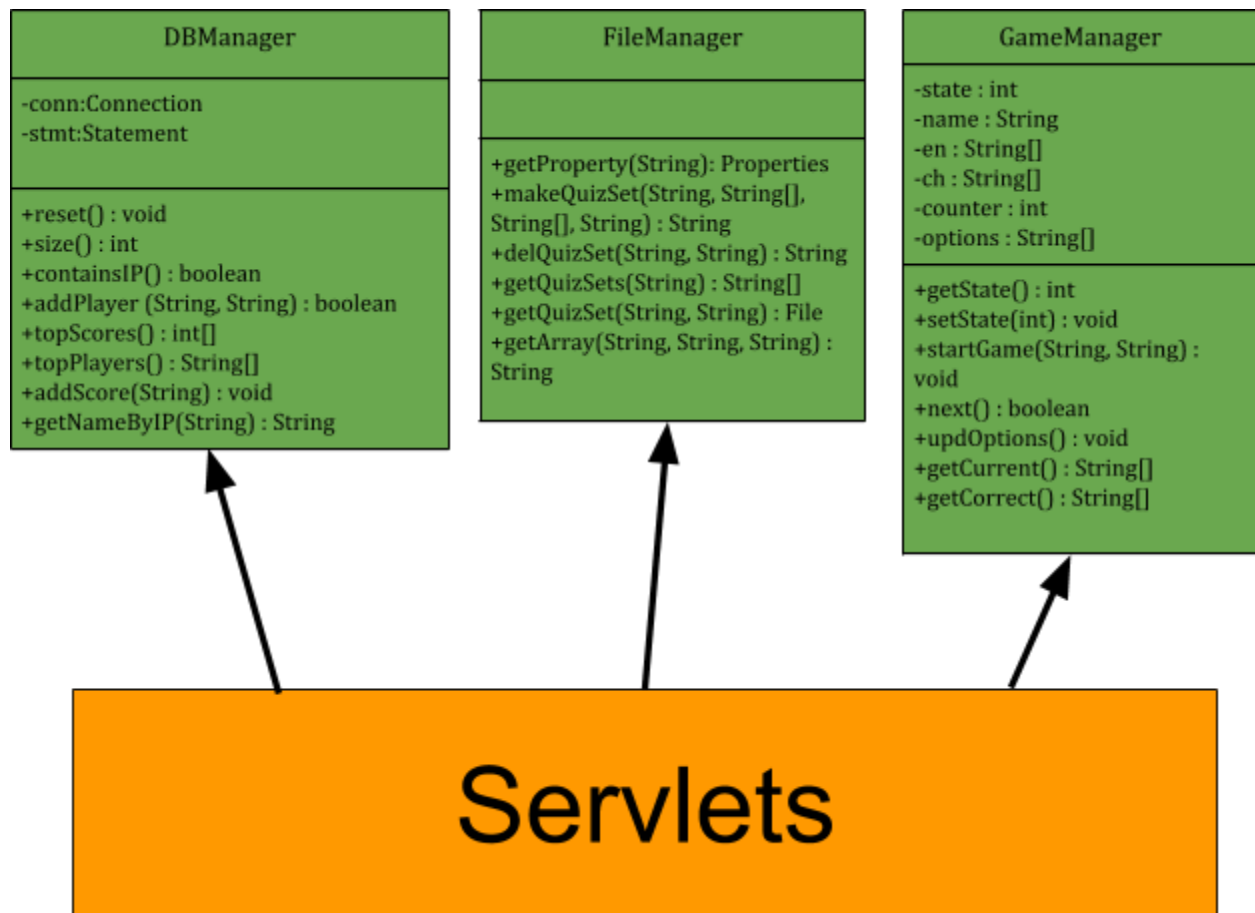


- PostgreSQL, a database system is used to hold player data. JSON Files are used to hold quiz set information.
- Information for PostgreSQL database and JSON files are retrieved through POJOs for use by the java servlet. Communications to and from the database by the POJOs is done through structured query language (SQL).
- The java servlet handles the student and teacher requests providing a web frontend using dynamic JSP files.

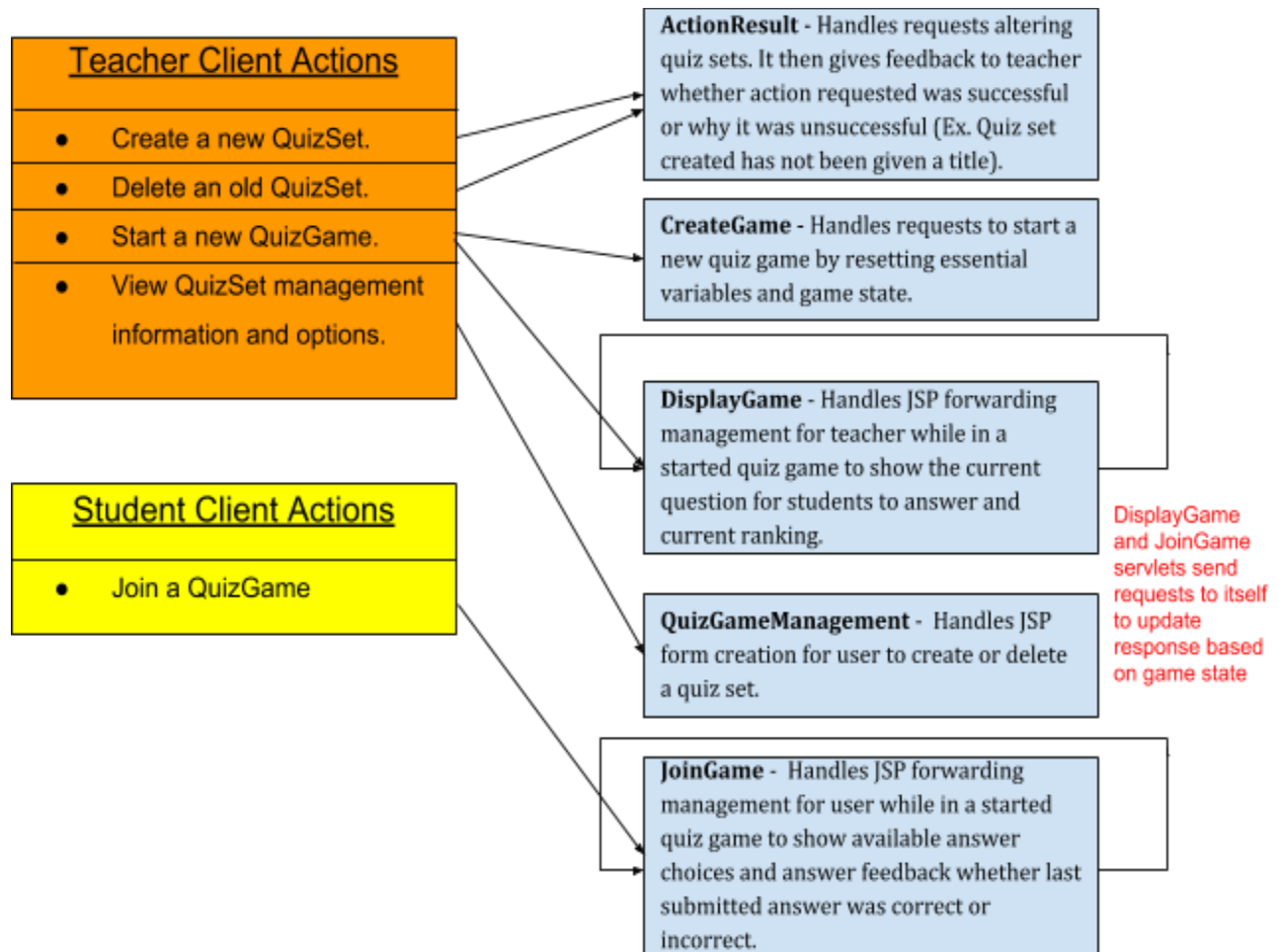
Plain Old Java Objects (POJOs) UML

POJOs are used in conjunction with servlets to handle persistent storage elements such as postgresQL queries and JSON file creations, deletions, and retrievals.

- The **DBManager** class holds user data and is used to tally points of each player and provide the ranking system.
- The **FileManager** class is used to refer to properties files to get required data and handle JSON file use.
- The **GameManager** class is used to keep note of the state of the game at any time and is often used by servlets to give the user the questions and answer choices of the quiz game for any given state of game.



Functionality of Each Servlet



Sample PostgreSQL Queries

Create players table

```
CREATE TABLE PLAYERS (  
    id BIGSERIAL PRIMARY KEY,  
    name TEXT UNIQUE,  
    score INTEGER,  
    ip TEXT UNIQUE  
);
```

Add a player

```
INSERT INTO PLAYERS  
VALUES (DEFAULT, '"+player+"', 0, '"+ip+"');
```

Get name of player of known IP

```
SELECT NAME FROM PLAYERS WHERE ip='192.168.254.112';
```

Add score to player of known IP

```
UPDATE PLAYERS SET SCORE=4 WHERE IP='192.168.254.112';
```

Reset before game start

```
DELETE * FROM PLAYERS;
```

Sample QuizSet in JSON format

```
{  
  "name": "TestQuizSet",  
  "English": ["North", "East", "South", "West"],  
  "Chinese": ["北方", "东方", "南方", "西方"]  
}
```

Testing Plan

Success Criterion	Method of Testing	Expected Result
1	Start a QuizGame	After a game begins, a question should appear on the teacher client, followed by more at in the order as shown in the JSON file.
2	Click an incorrect answer to a question. Then, click a correct answer to the next question.	A red screen should occur first saying that you were wrong. The next time, a green screen should occur stating you are correct.
3	Start a QuizGame, join the game on a student client and answer a question correctly.	After a question is asked, the current ranking of players should be shown. The student client should be ranked first for a correct answer.
4	Fill out a quiz set name, questions, and answers in the "create quiz set" menu and click submit.	A JSON file should be created in a "JSONFiles" folder on the server system with the information entered.
5	Submit a form for "Delete QuizSet"	The selected quiz set in the drop down menu should have its JSON file deleted from the server system.
6	Start a QuizGame	Questions from the selected quiz set in the drop down menu should be used in quiz game.
7	Finish a quiz game	At the end of the game, the student's individual score should be displayed to them.