NBA 2017 Quick Game Simulation

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Author Note

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Abstract

In this project, I implemented a NBA 2017 quick game with JSP, Servelt in Java and connected MySQL with Jdbc. In this game, player can choose a team with favorable lineup to fight with other team. All the result generated by the game is simulated based on the real ability of athletes in NBA 2017 season. The abilities of athletes are stored in Database at the beginning. And the match result will also be updated into database after the match is finished.

Keywords: NBA, Database, Jdbc, Java, JSP, Servlet, MySQL.

Introduction

The National Basketball Association is the major men's professional basketball league in North America, and is widely considered to be the premier men's professional basketball league in the world [1]. NBA 2017 Quick Game Simulation helps people to feel the real match by simply playing a game. People can choose their favorable lineup for starter in their hearts. Super Star is strong enough, but this game is full of possibility. This game contains a great amount of data, and a sophisticated algorithm to simulate the real data compared with the real world. The first version only contains 5 teams and about 50 athletes, but it will enlarge to entire NBA soon and will have Season Model and Manager Model. All teams, rosters and abilities are stored in MySQL database beforehand. For Quick Game Model, the match result will not influence the ability. But it will do in Season and Manager Model. Multi-JSPs are implemented with several Serverlets, as served by Tomcat 8.0. This project can entertain people who like NBA. Most importantly, it is very exciting for a developer to develop a game on his crazy love for NBA.

Requirements

Display available game model(s)

- Exposition: The Player can see all game model(s).
- Precondition: System started.
- Step-by-step description
    1. [Player]: The Player clicks on *Quick Game* button.
    2. [System]: The System provided all the available team for Player to choose.
    3. [Player]: The Player clicks on *Back to index* button to re-choose game model.
    4. [System]: The System displays all game model(s) for Player to play.

Display all the available NBA teams and rosters

- Exposition: The Player can see all teams and rosters.
- Precondition: System started.
- Step-by-step description
    1. [Player]: The Player clicks on the *See All Rosters* button
    2. [System]: The System displays all available teams with button.

3. [Player]: The Player chooses a team by clicking on according team name button.
4. [System]: The System displays all rosters, abilities and team logo accordingly.
5. [Player]: The Player can see rosters in other team by clicking *Back to all Roster* button.
6. [System]: The System provided all the available team for Player to choose.

Choose your opponent team

- Exposition: The Player can choose a team to battle with.
- Precondition: System started and the Player has not chosen a team yet.
- Step-by-step description:
  1. [System]: The system provided all available teams for the Player to choose.
  2. [Player]: The Player chooses a team in *Choose Your Opponent Team* list.
  3. [System] The system holds the team and waits Player to choose a favorable team to control.

Choose your favorable team

- Exposition: The Player can choose a team to control.
- Precondition: System started and the Player has not chosen a team yet.
- Step-by-step description:
  1. [System]: The System provided all available teams for the Player to choose.
  2. [Player]: The Player chooses a team in *Choose Your Team* list and clicks *Confirm*.
  3. [System]: The System provided Team Rosters with abilities.
  4. [System]: The System provided two lineup options. One is Default LineUp, the other is Player's own LineUp. The default LineUp is shown in bold.

Choose lineup in the player's team

- Exposition: The player chooses the lineup before match
- Precondition: The player has chosen a team
- Step-by-step description:

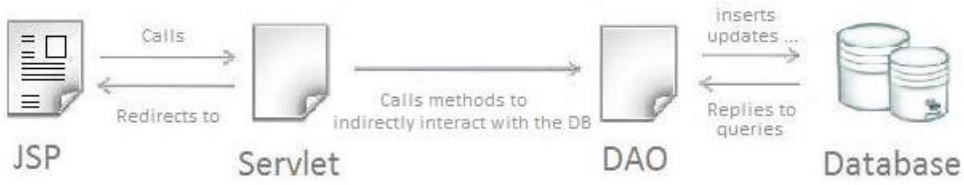
1. [System]: The System provided all the athletes according to their positions for players to choose lineup.
2. [Player]: The Players chooses 5 athletes according to different positions for the game.

Perform the match

- Exposition: Match result is generated automatically.
- Precondition: The match-begin confirmation has been confirmed
- Step-by-step description:
  1. [Player]: The Player confirms the lineup and click *confirm*
  2. [System]: The System simulates the match based on lineup abilities.
  3. [System]: The System provides the match results and updated statics in database.

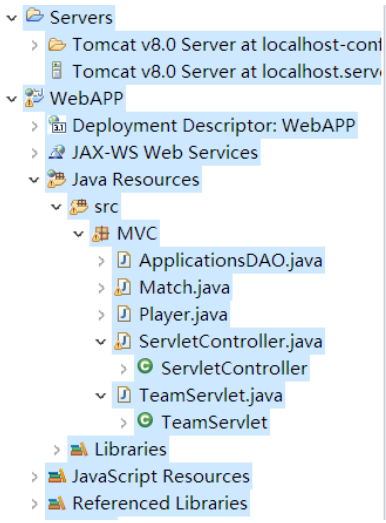
Design

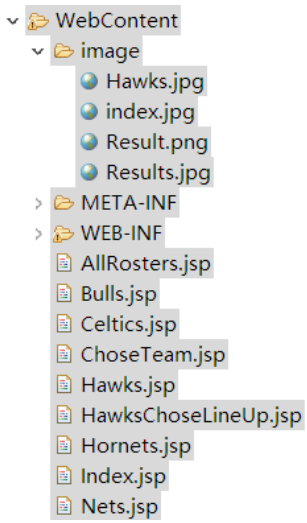
Whole game plan



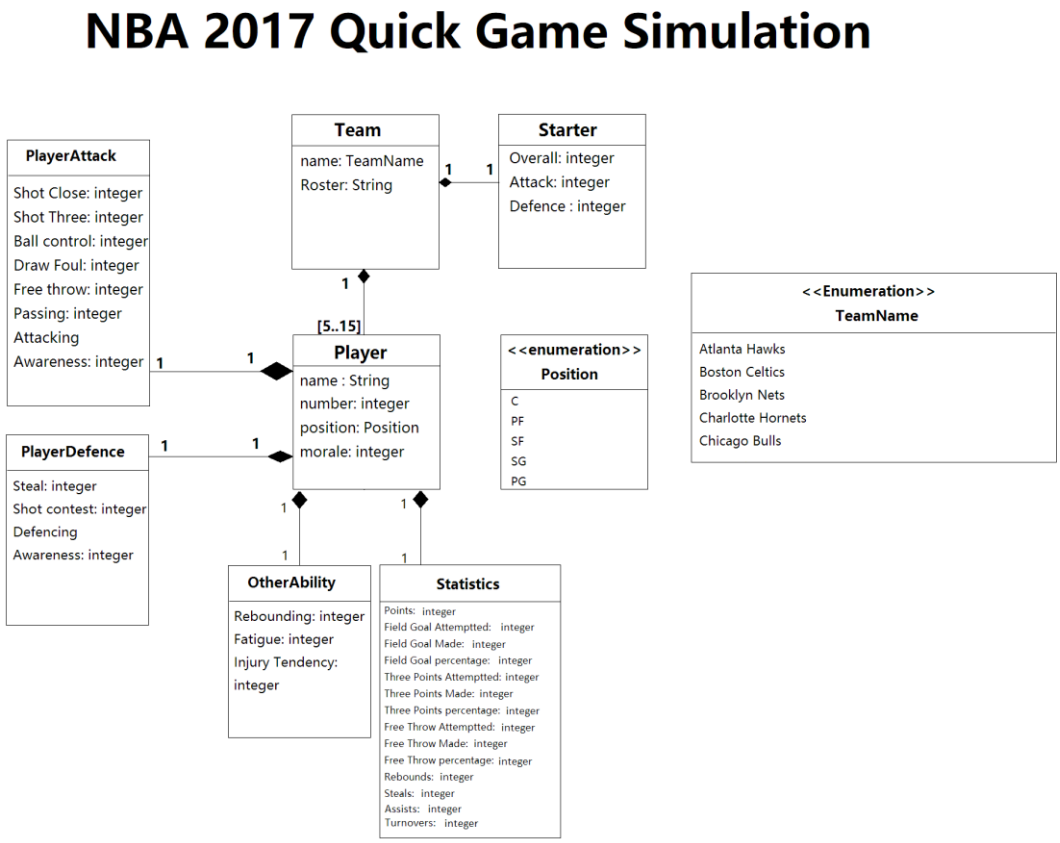
Player view content by browser supported by Tomcat 8.0. Multi-JSPs interact with several Servelets. Servelets connects with Datbase by a Data Access Object (DAO). Database provided athletes' abilities and match results.

Java File





Database UML



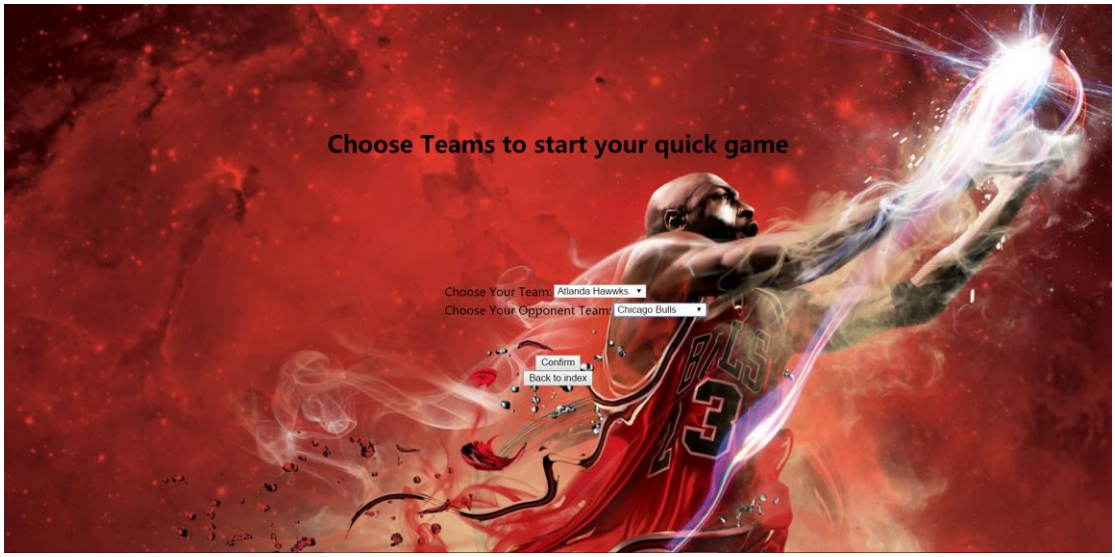
Implementation

Start the Game

Check all the Team and Rosters

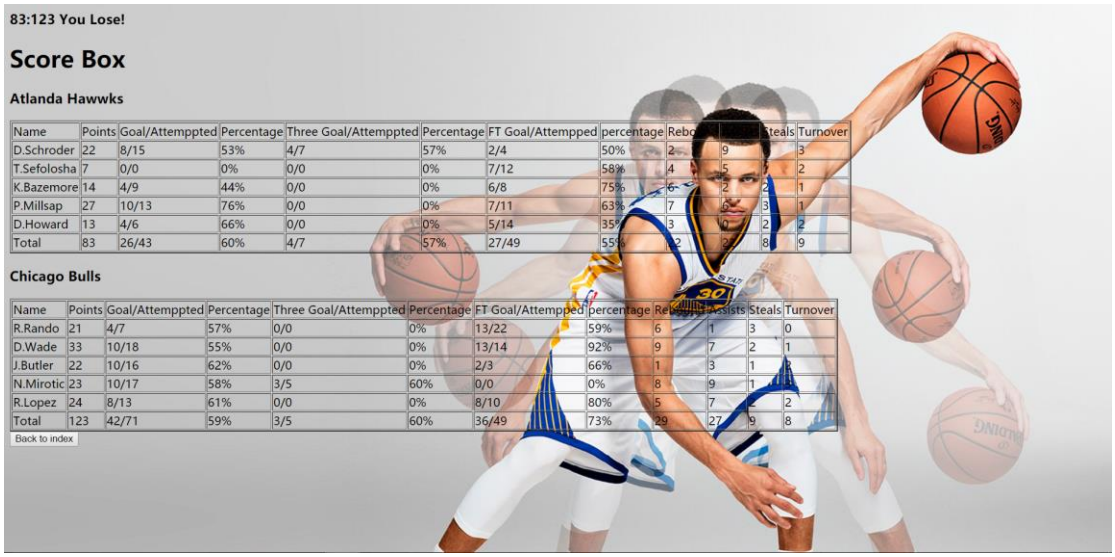
Check Rosters' abilities

Choose 2 teams to battle



Choose LineUp for your team before match begins

Match results and it will be uploaded to database.



83:123 You Lose!

Score Box

Atlanda Hawwks

Name	Points	Goal/Attemppted	Percentage	Three Goal/Attemppted	Percentage	FT Goal/Attempped	percentage	Rebo		Steals	Turnover
D.Schroder	22	8/15	53%	4/7	57%	2/4	50%	2	9		3
T.Sefolosha	7	0/0	0%	0/0	0%	7/12	58%	4	5		2
K.Bazemore	14	4/9	44%	0/0	0%	6/8	75%	6	2	2	1
P.Millsap	27	10/13	76%	0/0	0%	7/11	63%	7	5	3	1
D.Howard	13	4/6	66%	0/0	0%	5/14	35%	3	0	2	2
Total	83	26/43	60%	4/7	57%	27/49	55%	22	21	8	9

Chicago Bulls

Name	Points	Goal/Attemppted	Percentage	Three Goal/Attemppted	Percentage	FT Goal/Attempped	percentage	Rebo	Assists	Steals	Turnover
R.Rando	21	4/7	57%	0/0	0%	13/22	59%	6	1	3	0
D.Wade	33	10/18	55%	0/0	0%	13/14	92%	9	7	2	1
J.Butler	22	10/16	62%	0/0	0%	2/3	66%	1	3	1	3
N.Mirotic	23	10/17	58%	3/5	60%	0/0	0%	8	9	1	1
R.Lopez	24	8/13	61%	0/0	0%	8/10	80%	5	7		2
Total	123	42/71	59%	3/5	60%	36/49	73%	29	27	9	8

Back to index

Athletes' abilities in Database to be accessed for match

id	name	number	position	shotClose	shotThree	ballControl	drawFoul	freeThrow	pass	attackConsistency	steal	shotContest	defenceConsistency	rebound
1	P.Millsap	4	PF	71	57	57	66	69	57	68	72	61	88	67
2	D.Howard	8	C	69	37	33	75	42	33	58	54	73	73	75
3	D.Schroder	17	PG	48	69	80	67	75	76	66	63	60	56	34
4	K.Bazemore	24	SF	51	63	67	55	76	58	69	65	56	69	48
5	M.Scott	32	PF	66	60	41	55	76	38	62	55	56	47	59
6	T.Solitter	11	C	61	42	30	65	76	33	40	58	71	60	60
7	T.Hardawav Jr.	10	SG	54	63	72	62	83	65	41	55	51	38	31
8	T.Sefolosha	25	SG	55	54	63	70	58	46	25	68	75	65	48
9	K.Humphries	43	PF	58	58	36	62	76	37	56	53	61	46	70
10	J.Jack	3	PG	50	76	76	63	88	76	64	62	61	39	40

Match result stored in Database after match

id	name	points	fieldGoalAttemptted	fieldGoalMade	fieldGoalPercentage	3pointsAttemptted	3pointsMade	3pointsPercentage	freeThrowAttemptted	freeThrowMade
1	P.Millsap	27	13	10	76	0	0	0	11	7
2	D.Howard	13	6	4	66	0	0	0	14	5
3	D.Schroder	22	15	8	53	7	4	57	4	2
4	K.Bazemore	14	9	4	44	0	0	0	8	6
5	M.Scott	19	11	7	63	0	0	0	6	5
6	T.Solitter	4	3	1	33	0	0	0	3	2
7	T.Hardawav Jr.	15	10	5	50	0	0	0	5	5
8	T.Sefolosha	7	0	0	0	0	0	0	12	7
9	K.Humphries	33	19	12	63	0	0	0	12	9
10	J.Jack	36	15	8	53	6	4	66	18	16

Discussion

All use cases in the requirements are fulfilled.

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Conclusion

In this project, I designed and implemented a dynamic website with the use of MySQL database, which stores NBA athletes' abilities and game results that can be checked and accessed. The project fulfilled all basic use case requirements.
Future work is to implemented more teams and athletes. Create more game models. Make JSP more vivid. For example, now athlete's injury tendency, moral and fatigue are not making a big impact. But for a season game, win and lose will impact moral of athletes. Morals and fatigue can make impact on athlete's abilities. Athletes may injury during a long season and cannot be assigned to a match for a period of time. Efforts should also be put to ensure the security of the system and database.

References

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