# Test plan example

# Problem

A sports team has a name, and consists of a number of players. When the team has the required number of players, it can compete.

A player has a name, a team and a position. The position may be “Attack” or “Defence”, and is set only when the player is allocated to a team. If the player is not allocated to a team, the position must be blank (i.e. “”).

A player can only be in one team at a time. A player cannot be added to a team if he or she is already in the team.

A team cannot have more than the required number of players, although it can have fewer.

A team’s required number of players must be one or more.

Write and test Java classes to implement these requirements.

# Requirements

1. A team has a name
2. A team has a required number of players, which must be one or more
3. A player has a name
4. A player’s position is either “Attack” or “Defence” only when in a team
5. A player’s position must be blank (i.e. “”) when the player is not in a team
6. A team has zero or more players
7. A player can be added to a team
8. A player is in no team
9. A player is in one team
10. A player cannot be in more than one team at a time
11. A player cannot be added to a team if already in the team
12. A player can be removed from a team
13. When the number of players in a team is equal to the team’s required number of players, the team can compete
14. A team cannot have more than the required number of players

# Test cases

## Normal values

1. Team name = “A-Team” (R1)
2. Required number of players = 5 (R2)
3. Player name = “Jimmy” (R3)
4. Player position = “Attack” (R4)

## Invalid values

1. Team name = “” (R1)
2. Required number of players = -4 (R2)
3. Player name = “” (R3)
4. Player position = “Wing” (R4)

## Boundary values

1. Required number of players = 0 (R2)
2. Required number of players = 1 (R2)
3. Number of players in a team is one less than the team’s required number of players (R13)
4. Number of players in a team is equal to the team’s required number of players (R13)

## Special cases

1. Add player (Jimmy) to team (A-Team) in position “Defence” (R4, R7, R9)
2. Player (Jimmy) is removed from team (A-Team) (R5, R8, R12)
3. Remove a player from a team that has no players (R6)
4. Add a player to a team that already has the required number of players (R14)
5. Add a player to a team (B-Team) when the player is already in team (A-Team) (R10)
6. Add a player to a team (A-Team) when the player is already in team (A-Team) (R11)

# Test plan

Test plans should not be cumulative; i.e. a test must not rely on the prior successful execution of another test. Each test should be independent of all other tests.

| **Test** | **Instruction (Satisfies test cases)** | **Expected** |
| --- | --- | --- |
| T1 | Create a team called “A-Team” requiring 5 players  (N1, N2) | There is a team whose name is “A-Team” requiring 5 players |
| T2 | Create a player named “Jimmy”  (N3) | There is a player whose name is “Jimmy”, and whose position is blank |
| T3 | Create a team with a blank name requiring 5 players  (I1) | Error: team not created |
| T4 | Create a team called “Z-Team” requiring -4 players  (I2) | Error: team not created |
| T5 | Create a player with a blank name  (I3) | Error: player not created |
| T6 | Create a team called “Y-Team” requiring zero players  (B1) | Error: team not created |
| T7 | Create a team called “B-Team” requiring 1 player  (B2, B3) | There is a team whose name is “B-Team” requiring 1 player  The team cannot compete |
| T8 | Create a player named “Jimmy”  Create a team called “B-Team” requiring 1 player  Add player “Jimmy” to team “B-Team” in position “Defence”  (B4, S1) | Team “B-Team” has only one player, and that player’s name is “Jimmy”  The team can compete  Player “Jimmy” has a team with name = “B-Team”, and a position = “Defence” |
| T9 | Create a player named “Jimmy”  Create a team called “B-Team” requiring 1 player  Add player “Jimmy” to team “B-Team” in position “Defence”  Create player (“John”), and add this new player to team “B-Team” in position “Attack”  (S4) | Player “John” is not added to team B-Team  Player “John” does not have a team, and a position that is blank  The team “B-Team” has one player whose name is “Jimmy” |
| T10 | Create a player named “Jimmy”  Create a team called “B-Team” requiring 1 player  Add player “Jimmy” to team “B-Team” in position “Defence”  Remove player “Jimmy” from team “B-Team”  (S2) | Team “B-Team” has no players  The team cannot compete  Player “Jimmy” has no team, and a position that is blank |
| T11 | Create a player named “Jimmy”  Create a team called “B-Team” requiring 1 player  Add player “Jimmy” to team “B-Team” in position “Defence”  Remove player “Jimmy” from team “B-Team”  Remove player “Jimmy” from team “B-Team”  (S3) | Player “Jimmy” is not removed  The team “B-Team” has no players |
| T12 | Create a team called “A-Team” requiring 5 players  Create a team called “B-Team” requiring 1 player  Create a player named “Jimmy”  Add player “Jimmy” to team “A-Team” in position “Attack”  Add player “Jimmy” to team “B-Team” in position “Defence”  (N4, S5) | Team “A-Team” has only one player, and that player’s name is “Jimmy”  The team cannot compete  Player “Jimmy” has a team with name = “A-Team”, and a position = “Attack”  Team “B-Team” has no players, and cannot compete |
| T13 | Create a team called “A-Team” requiring 5 players  Create a player named “Jimmy”  Add player “Jimmy” to team “A-Team” in position “Attack”  Add player “Jimmy” to team “A-Team” in position “Defence”  (S6) | Player “Jimmy” is not added  Team “A-Team” has only one player, and that player’s name is “Jimmy”  The team cannot compete  Player “Jimmy” has a team with name = “A-Team”, and a position = “Attack” |
| T14 | Create a team called “A-Team” requiring 5 players  Create a player named “John”  Add player “John” to team “A-Team” in position “Wing”  (I4) | Player “John” is not added, has no team, and a position that is blank  Team “A-Team” has no players |