App Development & Modelling

BSc in Applied Computing

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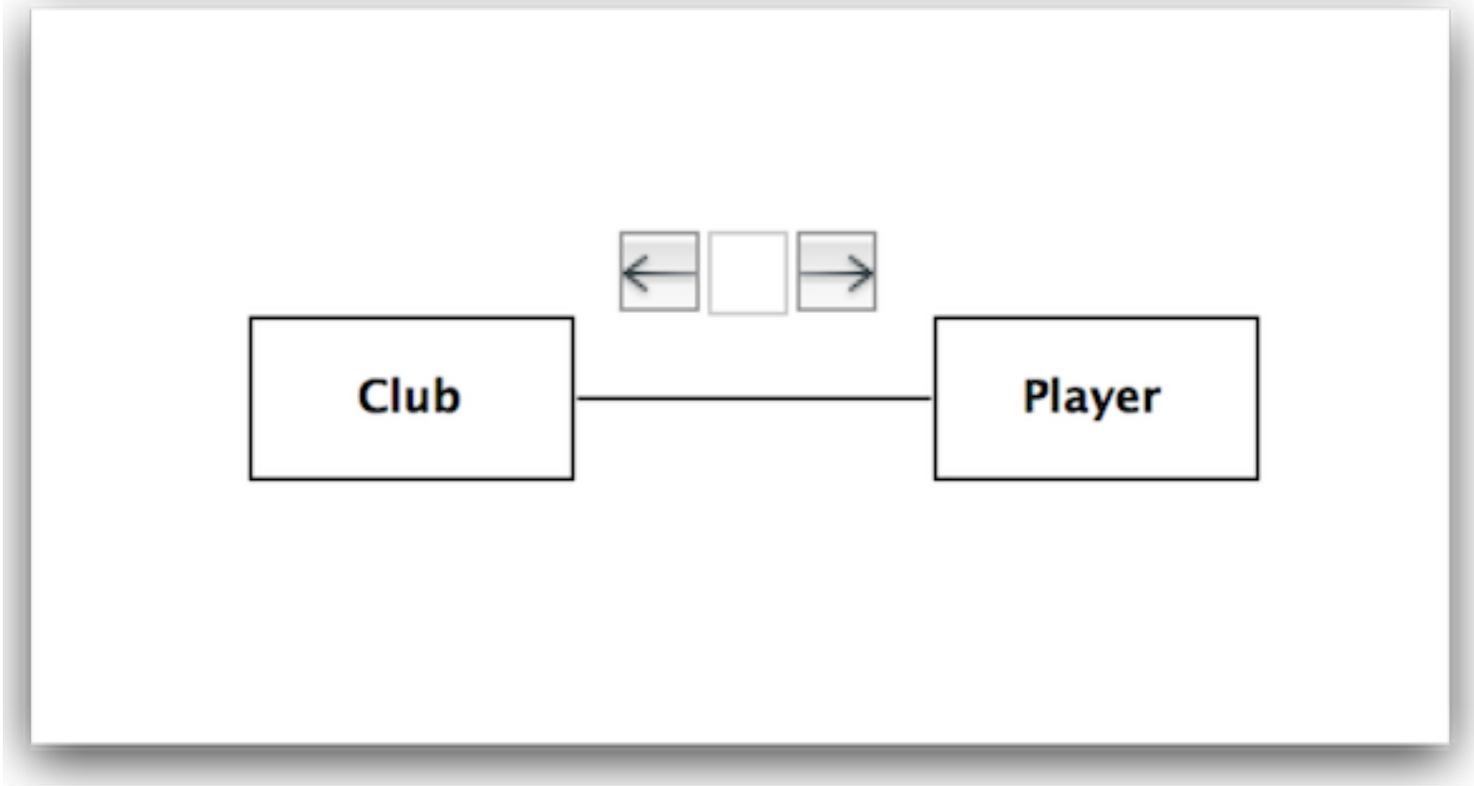
eLearning support unit

Modeling Relationships

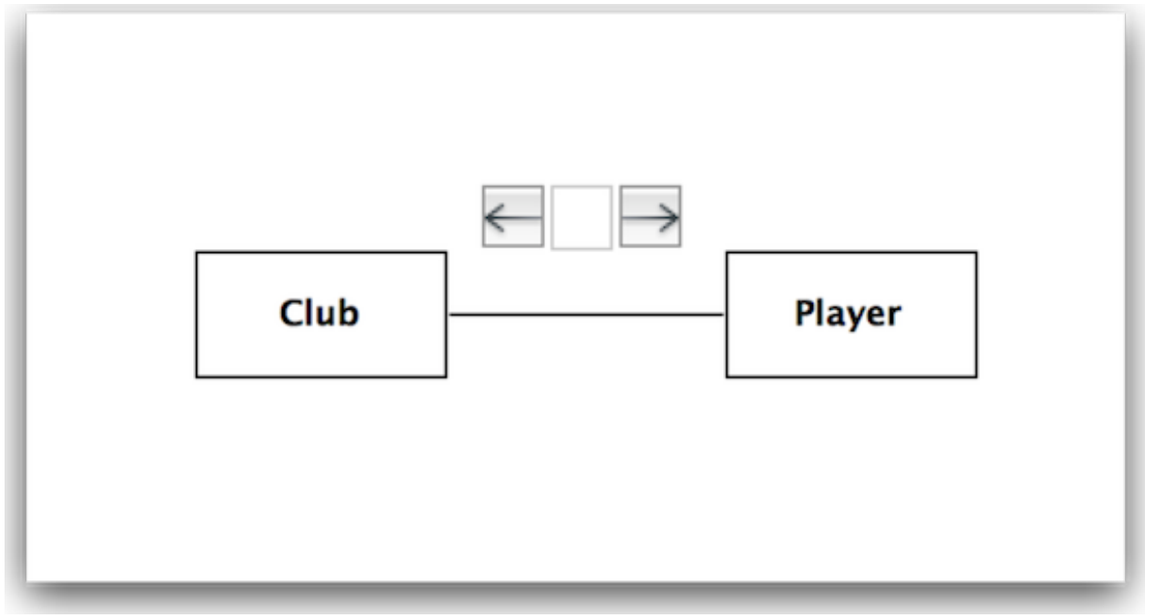
Associations

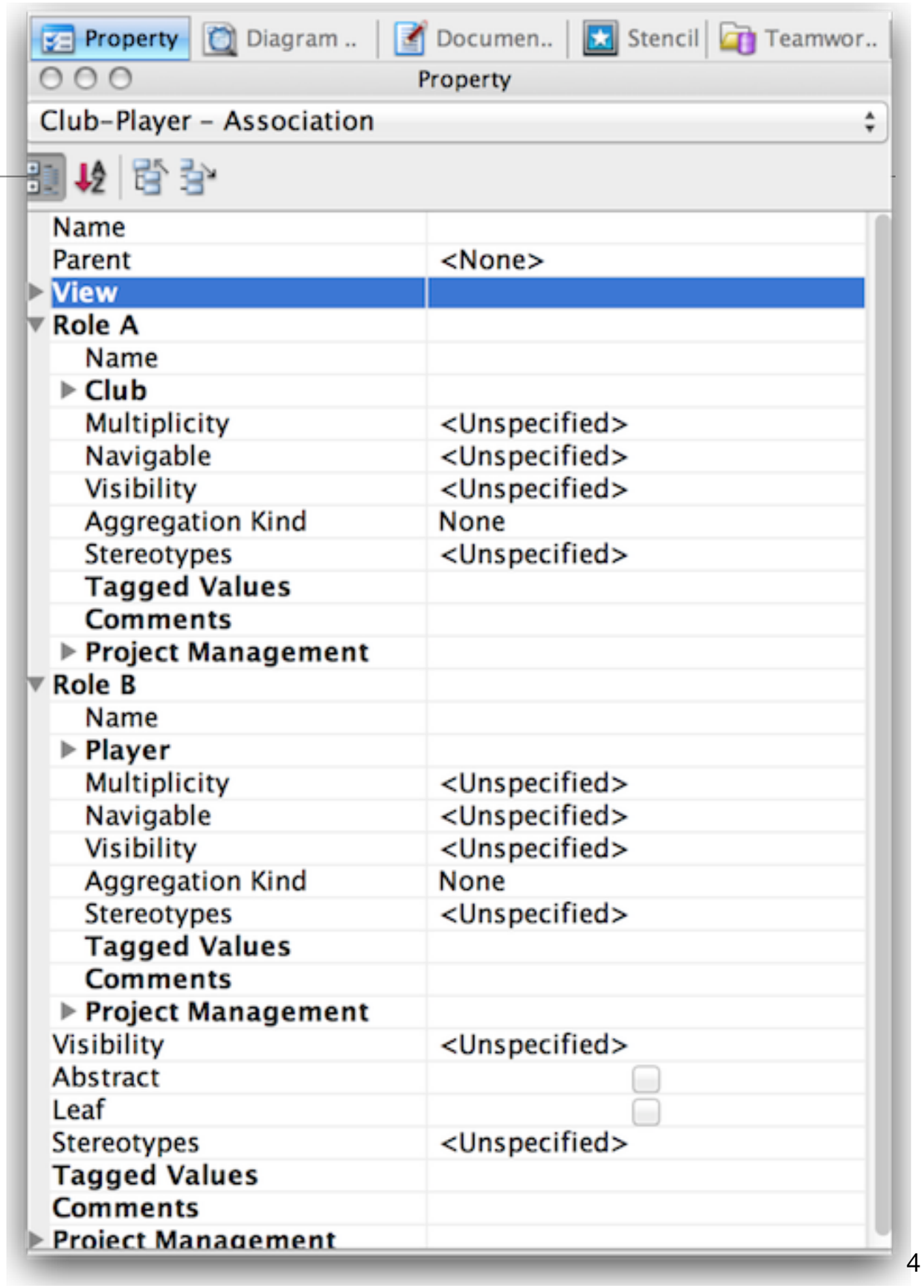
- In Visual Paradigm, on the palette on the left, select the 'association' element and use it to connect Club and Player.



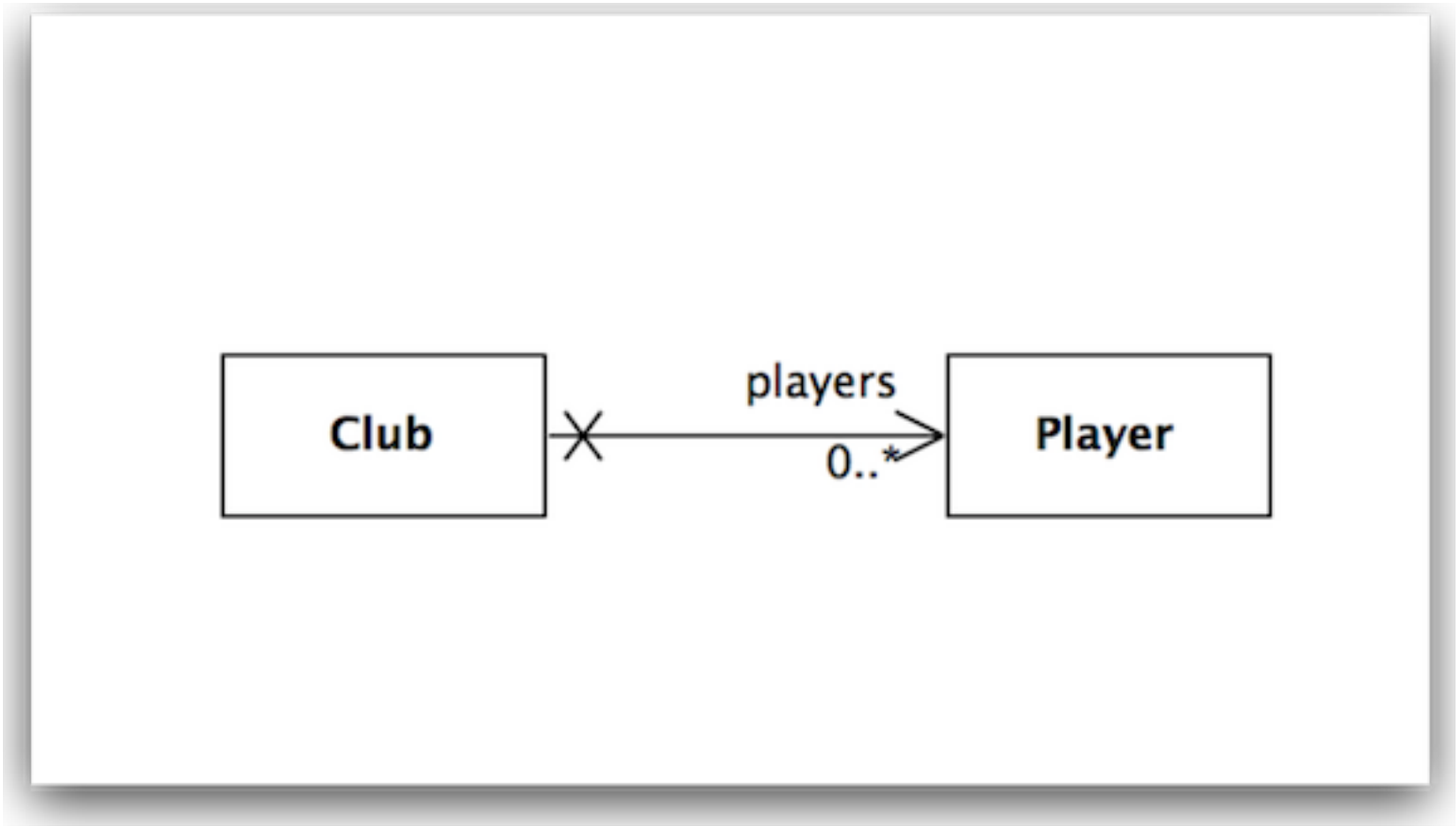
Association Attributes

- Select the association (the line), and locate the following panel:

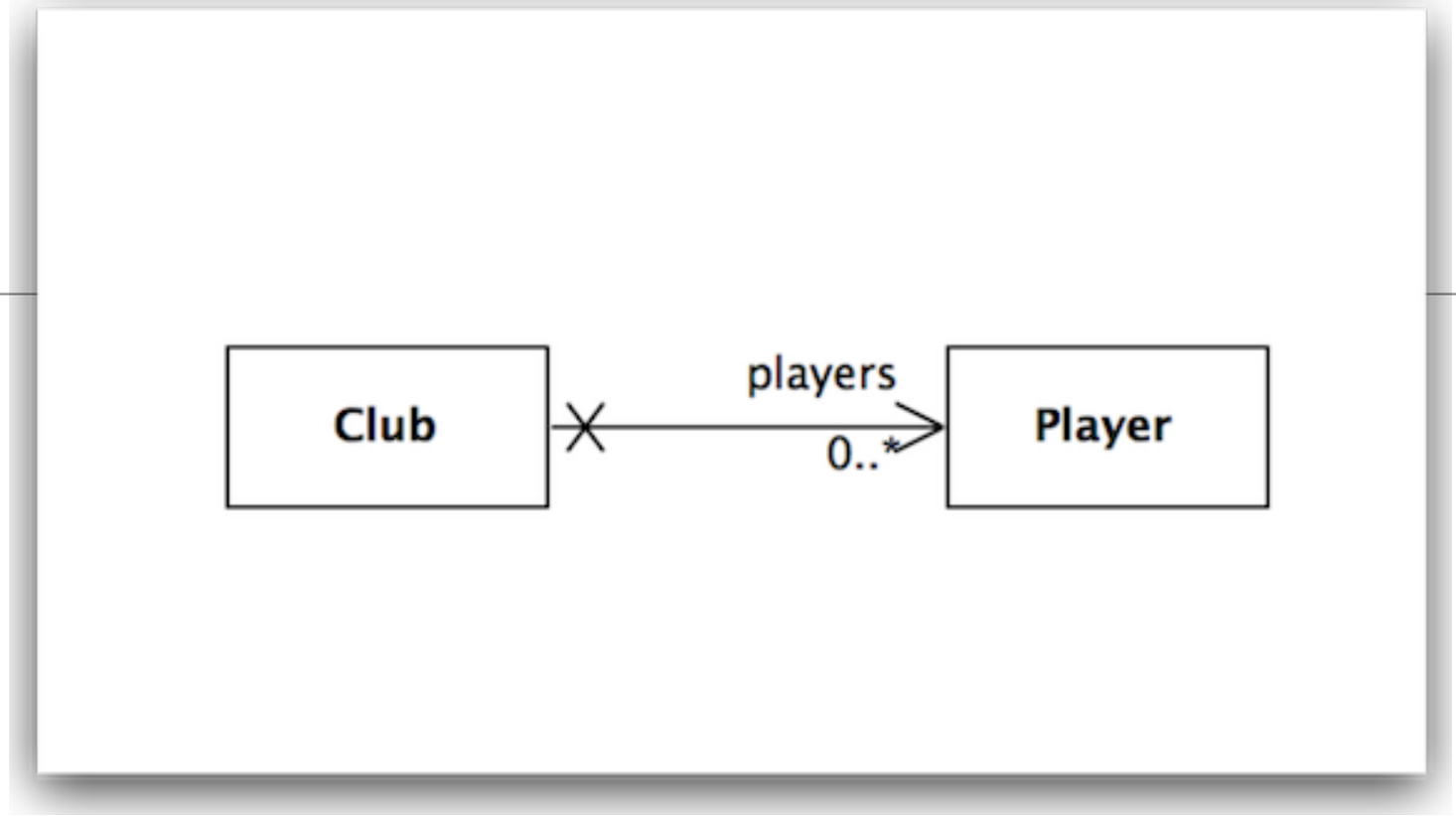




Multiplicity & Navigation



- Club has a collection of zero or more players
- Players are unaware of Club



Role A	
Name	
▶ Club	
Multiplicity	<Unspecified>
Navigable	False
Visibility	<Unspecified>
Aggregation Kind	None
Stereotypes	<Unspecified>
Tagged Values	
Comments	

Role B	
Name	players
▶ Player	
Multiplicity	0..*
Navigable	True
Visibility	<Unspecified>
Aggregation Kind	None
Stereotypes	<Unspecified>
Tagged Values	
Comments	

Implementation Relationship in Java Classes

```
public class Club extends Model
{
  public String name;

  @OneToMany(cascade=CascadeType.ALL)
  public List<Player> players;


  public Club(String name)
  {
    this.name = name;
    this.players = new ArrayList<Player>();
  }

  public String toString()
  {
    return name;
  }

  public void addPlayer(Player player)
  {
    players.add(player);
  }
}
```

```
public class Player extends Model
{
  public String name;


  public Player(String name)
  {
    this.name = name;
  }

  public String toString()
  {
    return name;
  }
}
```

Testing the Player / Club Relationship

- Use the fixture to set up some club / relationships

```
@Before
public void setup()
{
  p1 = new Player("mike");
  p2 = new Player("jim");
  p3 = new Player("frank");

  c1 = new Club("tramore");
  c2 = new Club("dunmore");
  c3 = new Club("fenor");

  c1.addPlayer(p1);
  c1.addPlayer(p2);

  c1.save();
  c2.save();
  c3.save();
}
```

testPlayers

- In the test, see if these relationship have been established

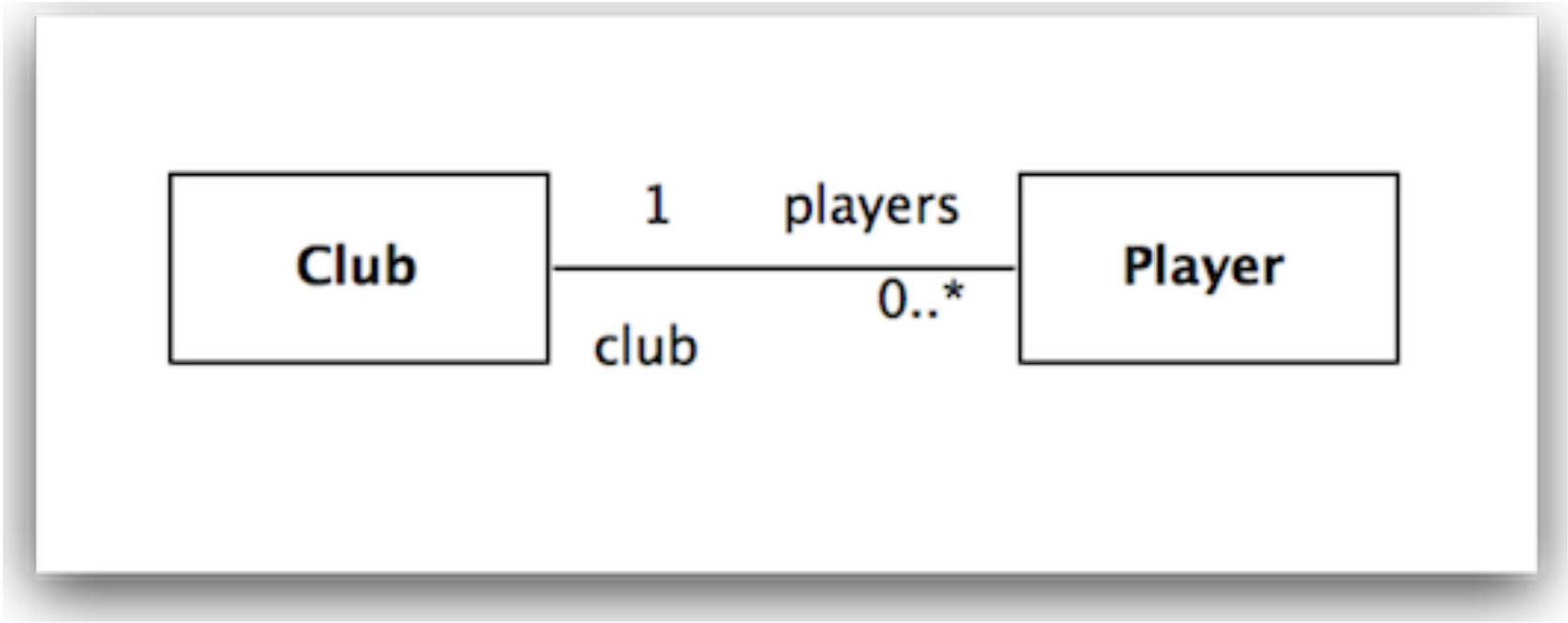
```
@Test
public void testPlayers()
{
  Club tramore = Club.findByName("tramore");

  assertEquals (2, tramore.players.size());

  Player mike  = Player.findByName("mike");
  Player jim   = Player.findByName("jim");
  Player frank = Player.findByName("framk");

  assertTrue  (tramore.players.contains(mike));
  assertTrue  (tramore.players.contains(jim));
  assertFalse (tramore.players.contains(frank));
}
```

testRemovePlayers

- Removing relationships must also be tested

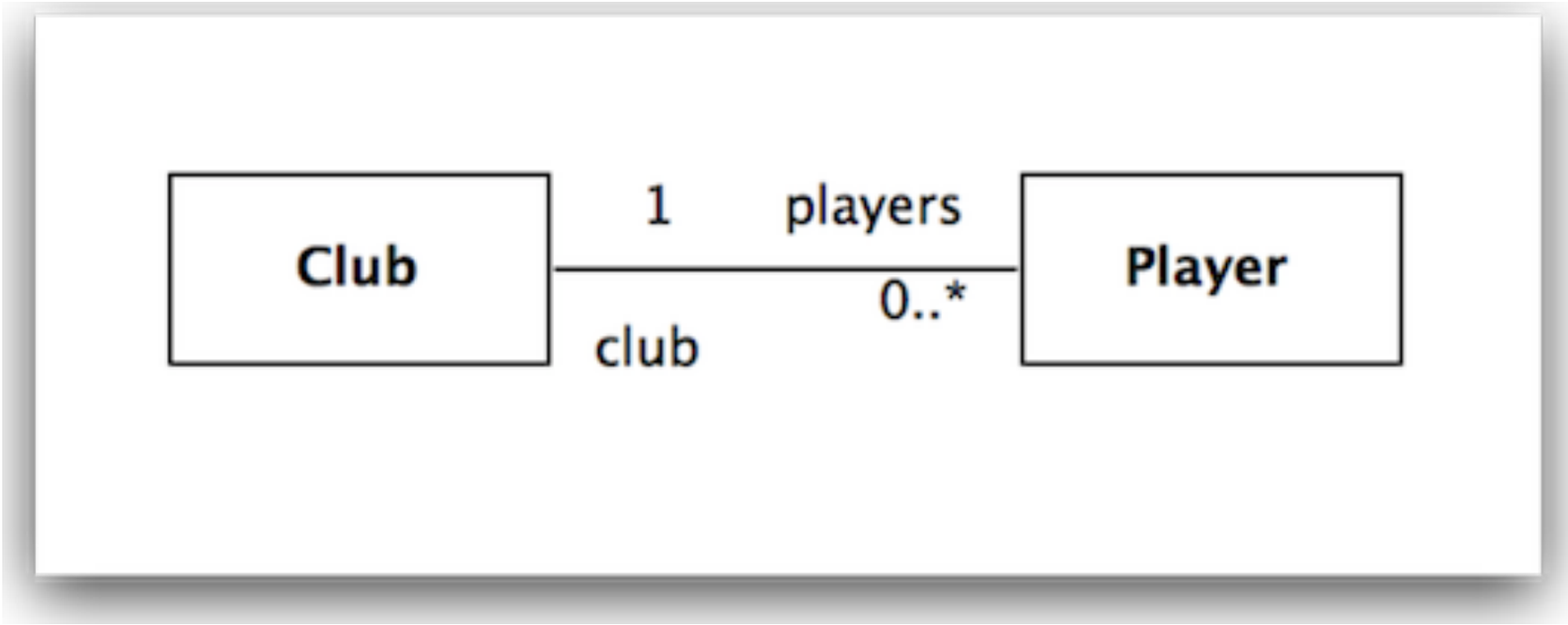
```
@Test
public void testRemovePlayer()
{
  Club tramore = Club.findByName("tramore");
  assertEquals(2, tramore.players.size());

  Player mike  = Player.findByName("mike");
  assertTrue(tramore.players.contains(mike));
  tramore.players.remove(mike);
  tramore.save();

  Club c = Club.findByName("tramore");
  assertEquals(1, c.players.size());

  mike.delete();
}
```

Bidirectional Relationship



- Club has a ‘one to many’ relationship with players
- Player has a ‘many to one’ relationship with club

Bidirectional Relationship



Role A	
Name	club
Club	
Multiplicity	1
Navigable	True
Visibility	<Unspecified>
Aggregation Kind	None
Stereotypes	<Unspecified>
Tagged Values	
Comments	

Bidirectional Relationship in Java Classes

```
public class Club extends Model
{
  public String name;

  @OneToMany(mappedBy="club", cascade=CascadeType.ALL)
  public List<Player> players;


  public Club(String name)
  {
    this.name = name;
    this.players = new ArrayList<Player>();
  }

  public String toString()
  {
    return name;
  }

  public void addPlayer(Player player)
  {
    player.club = this;
    players.add(player);
  }
}
```

```
public class Player extends
Model
{
  public String name;

  @ManyToOne
  public Club club;

  public Player(String name)
  {
    this.name = name;
  }

  public String toString()
  {
    return name;
  }
}
```

Unidirectional Relationship in Java Classes

```
public class Club extends Model
{
  public String name;

  @OneToMany(cascade=CascadeType.ALL)
  public List<Player> players;


  public Club(String name)
  {
    this.name = name;
    this.players = new ArrayList<Player>();
  }

  public String toString()
  {
    return name;
  }

  public void addPlayer(Player player)
  {
    players.add(player);
  }
}
```

```
public class Player extends Model
{
  public String name;


  public Player(String name)
  {
    this.name = name;
  }

  public String toString()
  {
    return name;
  }
}
```

Exercise: Model This: