Goal: For the given scenario create the RBAC model in SecureUML (class diagram).

Task 1. Elicit the relevant RBAC information. Answer the following questions:

1.1. What are the objects (e.g., in your scenario document) and their attributes?

   Note: it is expected that you will characterise the document regarding its contents, i.e., field, entries. For instance, in the case of the Phonebook, its field entries are its name, issue year, list of persons; A person could be characterised by his name and phone number.

1.2. What are operations that change values of the attributes?

1.3. What are the roles?

1.4. What are the security actions?

   Note: the following security actions and their meanings could be used:
   - Read – element value is visible.
   - Write – if the element is visible (allowed to read) then it is allowed to change the value.
   - Insert – if multiple sections (form field multiplicity) allowed, then it is possible to add another section.
   - Delete – allowed removing elements.

Task 2. Model the RBAC solution. Apply the template given in Figure 1.

---

```
«secuml.permission»
...

«secuml.role»
...

«secuml.resource»
...
```

Figure 1: RBAC template
2.1. Model the resource (i.e. document) that needs to be protected.

- Define classes of secure resources;
- Define field entries as class attributes;
- Define attribute types. Simple (i.e., the which needs to be secured) attribute types for an element:
  - String data types: string.
  - Date data types: date, time.
  - Numeric data types: integer, byte, decimal.
  - Miscellaneous data types: Boolean.
- Define complex types for logical groups. For example: contact information of a person can be a complex type containing of personName and phoneNumber attributes.

2.2. Define the attribute multiplicities

Note: Define attributes multiplicity: 1, 1..*, 0..*, 0..5, etc. By default 1. For example (see Figure 2) a person have 0..* friends, but he can make a party where he can invite 0 to 20 (0..20) persons as the pub does not have more places.

![Figure 2: Secure resource definition](image)

2.3. Model the roles and their permissions.

Security action model is given in Figure 3.

![Figure 3: Security actions](image)

2.4. Define the security authorisation constraints (textually). This means, describe the link between the security actions of the roles and the resource operations (over the attributes).

For example:

<permission attribute> – <resource operation> – <resource attribute>

obtainPersonsPhoneNumber:READ – readPhoneNumber() – phoneNumber
Football game report is started before the match, continued during the match, and finalised once the match is over.

The new report is created by the league secretary, who is employed by the Football federation. The league secretary fills in initial information such as league name, his own contact data, region, division, and game numbers as well as the names of the competing teams. Once done, the league secretary informs the team representatives, so that they could provide the team compositions registered for the game, including player names and their registration numbers. Team composition should be provided no later than 2 hours before the game.

During the match the game report needs to be maintained by the umpire, who need to register the scored goals and “given” cards. Umpire is also responsible for filling in the match results, including the score(s) (including final, full time, extra time and penalties). After the game the match the umpire needs to invite the team representatives to sign the report and (in any) provide their comments. Once signature from the team representatives received, the umpire himself comments and signs the report. After the game the report is sent to the league secretary for confirmation.

Below you will see the report filled by different people. Their “fillings” are provided in blue.
WOLFS FOOTBALL LEAGUE MATCH REPORT FORM

League Secretary
CALEX KARUUNA
20 STREET ALLEA
TALLINN
ESTONIA

Each team representative is to sign this form and ensure that all details are correct and that all players are registered with the ERIS system.

ALL MATCH REPORT FORMS MUST BE SENT TO LEAGUE SECRETARY BY THE TUESDAY AFTER THE GAME

<table>
<thead>
<tr>
<th>LEAGUE NAME</th>
<th>WOLFS</th>
<th>DIVISION</th>
<th>GAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>REGION</td>
<td>Tartumaa</td>
<td></td>
<td>A69</td>
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<table>
<thead>
<tr>
<th>HOME TEAM NAME</th>
<th>Final score:</th>
<th>AWAY TEAM NAME</th>
<th>Final score:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green Rabbits</td>
<td></td>
<td>Orange Carrots</td>
<td></td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>FULL NAME</th>
<th>REG, NO</th>
<th>CARDS</th>
<th>GOALS</th>
<th>FULL NAME</th>
<th>REG, NO</th>
<th>CARDS</th>
<th>GOALS</th>
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<tbody>
<tr>
<td>[1] Andrius</td>
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<td>Bebras</td>
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<td></td>
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<tr>
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<td>YY-&gt;R</td>
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<td>Bronius</td>
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<td>Brokas</td>
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<tr>
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<td></td>
<td>Burokelis</td>
<td>10</td>
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<td></td>
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<tr>
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<td>6</td>
<td>Y</td>
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<td>Barstis</td>
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<tr>
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<td>7</td>
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<td></td>
<td>Barskuole</td>
<td>4</td>
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<td>1</td>
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<tr>
<td>[8] Anupras</td>
<td>10</td>
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<td></td>
<td>Berzelis</td>
<td>6</td>
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<td>1</td>
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<tr>
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<td>Boruzele</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
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<td></td>
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<td>Buuu</td>
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<tr>
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<td>Birziska</td>
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<th>Extra time score</th>
<th>Penalties</th>
<th>Full time score</th>
<th>Extra time score</th>
<th>Penalties</th>
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<tbody>
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<td>1</td>
<td>-</td>
<td>2</td>
<td>0</td>
<td>-</td>
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</table>

Signature of Home Team Representative  
HomeSigned  
YES
No

Signature of Away Team Representative  
AwaySignedReport  
YES
No

I am satisfied with my opponents registration/performance  (Please indicate YES or NO above)  
Home Team Caution  No problem, everything is OK  
Away Team Caution  No problem, everything is OK  

Umpire Name  
Billy-Goal the Beard  
Referee signature  BilGoatB  
Umpire Comment  No comments

Confirmation by league secretary  
Confirmed  Not confirmed

Confirmation date  
2020.02.20