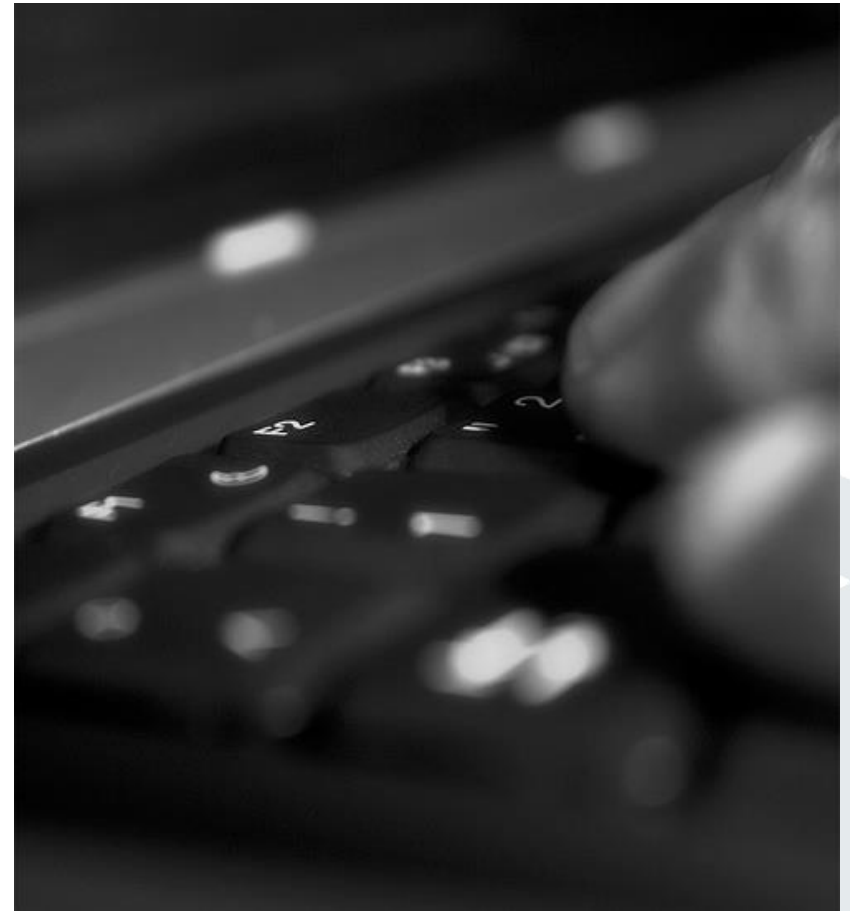


Exercise 5 Business Informatics 2 (PWIN)

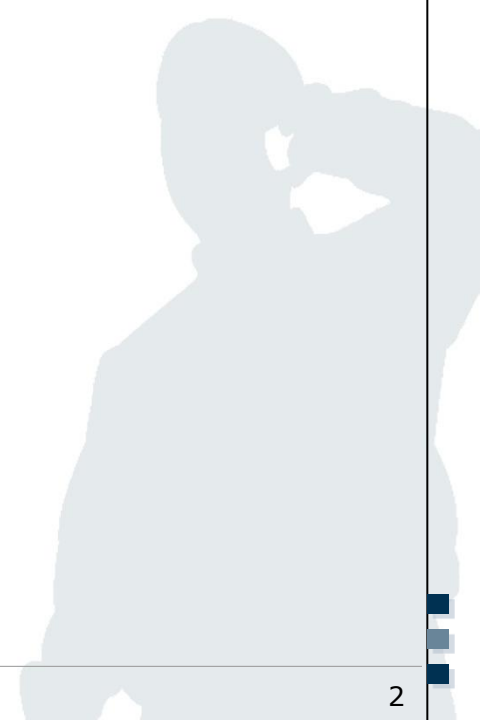
Markup Languages & Unified Modeling Language

Christopher Schmitz, M.Sc.
www.m-chair.de

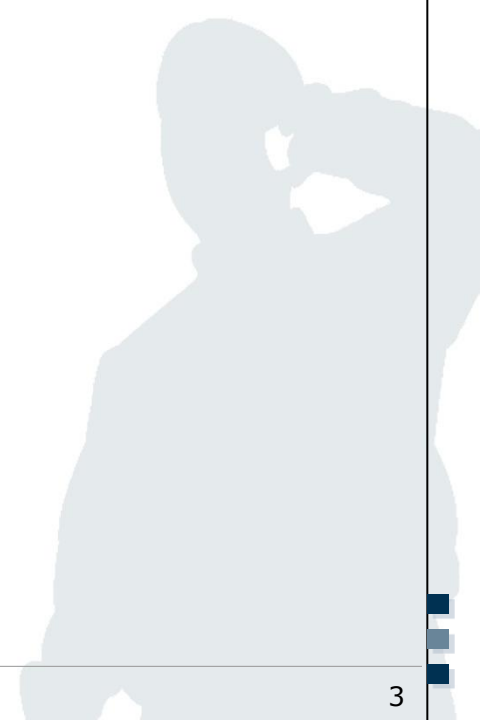


Jenser (Flickr.com)

- Exercise 1: Well-formed XML Documents
- Exercise 2: Document Type Definition
- Exercise 3: Unified Modeling Language



1 a) What is meant by a well-formed XML document?

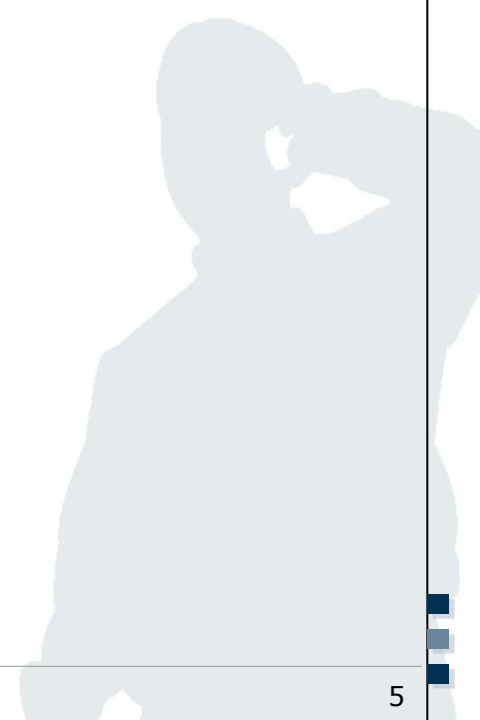


An XML document is **well-formed**, if:

- The element tags are case-sensitive
- No special syntax characters: & ' < > "
- The element tags are correctly nested
- Only one "root" element
- Properly encoded legal unicode characters

```
<?xml version="1.0"?>
<flirt>
  <name>Daisy</name>
  <mobile>436508469249</mobile>
  <email>daisy@m-chair.de</email>
  <city>Innsbruck</city>
  <first date>2020-01-23</first date>
  <last date>2020-05-01</last date>
  <birthday>1993-11-13</birthday>
  <vegetarian>no</vegetarian>
  <status>single</status>
</flirt>
```

1 b) Indicate which of the following XML documents are well-formed? Mark the mistakes and correct them.



```
<?xml version="1.0"?>
<User id="194">
  <Pseudonym>
    Jenny23
  </Pseudonym>
  <Mobile_Operator>
    t-mobile
  </Mobile_Operator>
  <Registration>
    03.02.2020
  </Registration>
  <Lastlogin>
    29.04.2020
  </Lastlogin>
</User>
```

```
<?xml version="1.0"?>
<User id=203>
  <Pseudonym>
    Joe1976
  </Pseudonym>
  <Mobile_Operator>
    vodafone
  </Mobile_Operator>
  <Registration>
    06.02.2020
  <Lastlogin>
    31.04.2020
  </User>
```

```
<?xml version="1.0"?>
<User id="194">
  <Pseudonym>
    Jenny23
  </Pseudonym>
  <Mobile_Operator>
    t-mobile
  </Mobile_Operator>
  <Registration>
    03.02.2020
  </Registration>
  <Lastlogin>
    29.04.2020
  </Lastlogin>
</User>
```

```
<?xml version="1.0"?>
<User id="203">
  <Pseudonym>
    Joe1976
  </Pseudonym>
  <Mobile_Operator>
    vodafone
  </Mobile_Operator>
  <Registration>
    06.02.2020
  </Registration>
  <Lastlogin>
    31.04.2020
  </Lastlogin>
</User>
```

```
<?xml version="1.0"?>
<Date>
  <Places>
    An der Hauptwache 7
  </Place>
  <Time>
    25.03.2020, 21:15-0:15
  </Time>
  <Meeting_Point>
    Starbucks
  <People>
    Gina
  </Meeting_Point>
</People>
<People>
  Jimmy
</People>
<Activitiy>
  Cocktails
</Activitiy>
<Comment>
  Spend Gina 2 Caipis
</Comment>
</date>
```

```
<?xml version="1.0"?>
<Date>
  <Place>
    Theodor-W.-Adorno-Platz 5
  </Place>
  <Time>
    25.03.2020, 16:15-19:15
  </Time>
  <Meeting_Point>
    Sturm und Drang
  </Meeting_Point>
  <People>
    Joe1976
  </People>
  <People>
    Jenny23
  </People>
  <Activitiy>
    Drinking beer
  </Activitiy>
  <Comment>
    Joe1976 wears sun glasses!
  </Comment>
</Date>
```



```
<?xml version="1.0"?>
<Date>
  <Places>
    An der Hauptwache 7
  </Place>
  <Time>
    25.03.2020, 21:15-0:15
  </Time>
  <Meeting_Point>
    Starbucks
  </Meeting_Point>
  <People>
    Gina
  </People>
  <People>
    Jimmy
  </People>
  <Activitiy>
    Cocktails
  </Activitiy>
  <Comment>
    Spend Gina 2 Caipis
  </Comment>
</Date>
```

```
<?xml version="1.0"?>
<Date>
  <Place>
    Theodor-W.-Adorno-Platz 5
  </Place>
  <Time>
    25.03.2020, 16:15-19:15
  </Time>
  <Meeting_Point>
    Sturm und Drang
  </Meeting_Point>
  <People>
    Joe1976
  </People>
  <People>
    Jenny23
  </People>
  <Activitiy>
    Drinking beer
  </Activitiy>
  <Comment>
    Joe1976 wears sun glasses!
  </Comment>
</Date>
```

1 c) Explain why the following XML document is not well-formed. Correct the syntax error.

```
<?xml version="1.0"?>
<User id="203">
  <Sex>
    Male
  </Sex>
  <Age>
    21
  </Age>
</User>
<User id="194">
  <Sex>
    Female
  </Sex>
  <Age>
    23
  </Age>
</User>
```

Exercise 1 c): Well-formed XML Documents

Two root elements are defined.
But well-formed XML documents
only allow one root element.

```
<?xml version="1.0"?>
```

```
<Users>
```

```
  <User id="203">
```

```
    <Sex>
```

```
      Male
```

```
    </Sex>
```

```
    <Age>
```

```
      21
```

```
    </Age>
```

```
  </User>
```

```
  <User id="194">
```

```
    <Sex>
```

```
      Female
```

```
    </Sex>
```

```
    <Age>
```

```
      23
```

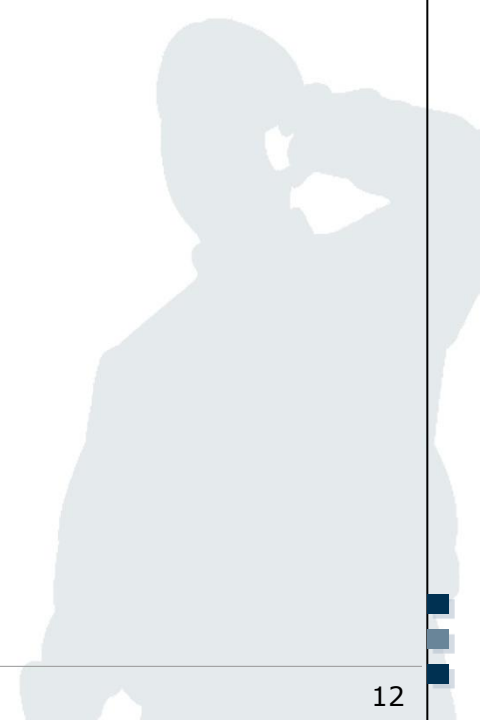
```
    </Age>
```

```
  </User>
```

```
</Users>
```

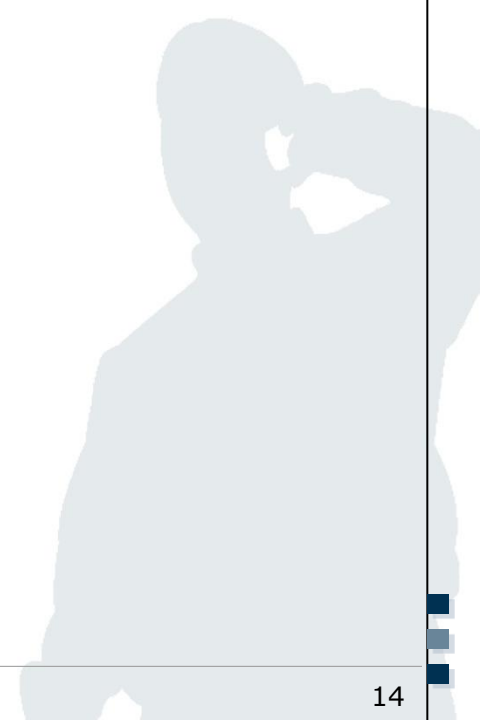
1 d) Create an XML document representing your two favorite dating locations.

Use at least two different tags for describing the locations and at least one attribute.



```
<?xml version="1.0"?>
<Locations>
  <Location id="332">
    <Name>DASEIN</Name>
    <Rating>Good</Rating>
  </Location>
  <Location id="143">
    <Name>Sturm und Drang</Name>
    <Rating>Good</Rating>
  </Location>
</Locations>
```

- Exercise 1: Well-formed XML Documents
- Exercise 2: Document Type Definition
- Exercise 3: Unified Modeling Language



Exercise 2: Document Type Definition

Create a DTD for the XML document from Exercise 1 b).

```
<?xml version="1.0"?>
<User id="194">
  <Pseudonym>
    Jenny23
  </Pseudonym>
  <Mobile_Operator>
    t-mobile
  </Mobile_Operator>
  <Registration>
    03.02.2020
  </Registration>
  <Lastlogin>
    29.04.2020
  </Lastlogin>
</User>
```

```
<?xml version="1.0"?>
<User id="194">
  <Pseudonym>
    Jenny23
  </Pseudonym>
  <Mobile_Operator>
    t-mobile
  </Mobile_Operator>
  <Registration>
    03.02.2020
  </Registration>
  <Lastlogin>
    29.04.2020
  </Lastlogin>
</User>
```

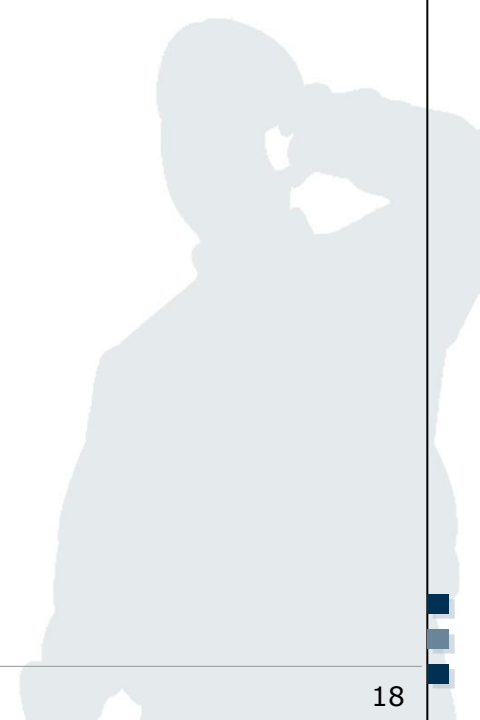
```
<!DOCTYPE User [
  <!ELEMENT User
    (Pseudonym,Mobile_Operator,
    Registration,Lastlogin)>

  <!ELEMENT Pseudonym (#PCDATA)>
  <!ELEMENT Mobile_Operator (#PCDATA)>
  <!ELEMENT Registration(#PCDATA)>
  <!ELEMENT Lastlogin(#PCDATA)>
]>
```


- Exercise 1: Well-formed XML Documents
- Exercise 2: Document Type Definition
- Exercise 3: Unified Modeling Language



3 a) What are the differences between use case and activity diagrams?



- Use case diagram

} Use case diagram

- Class diagram
- Object diagram

} Structural diagrams

- Activity diagram
- Sequence diagram
- Collaboration diagram
- State diagram

} Behavioural diagrams

- Component diagram
- Deployment diagram

} Architectural diagrams

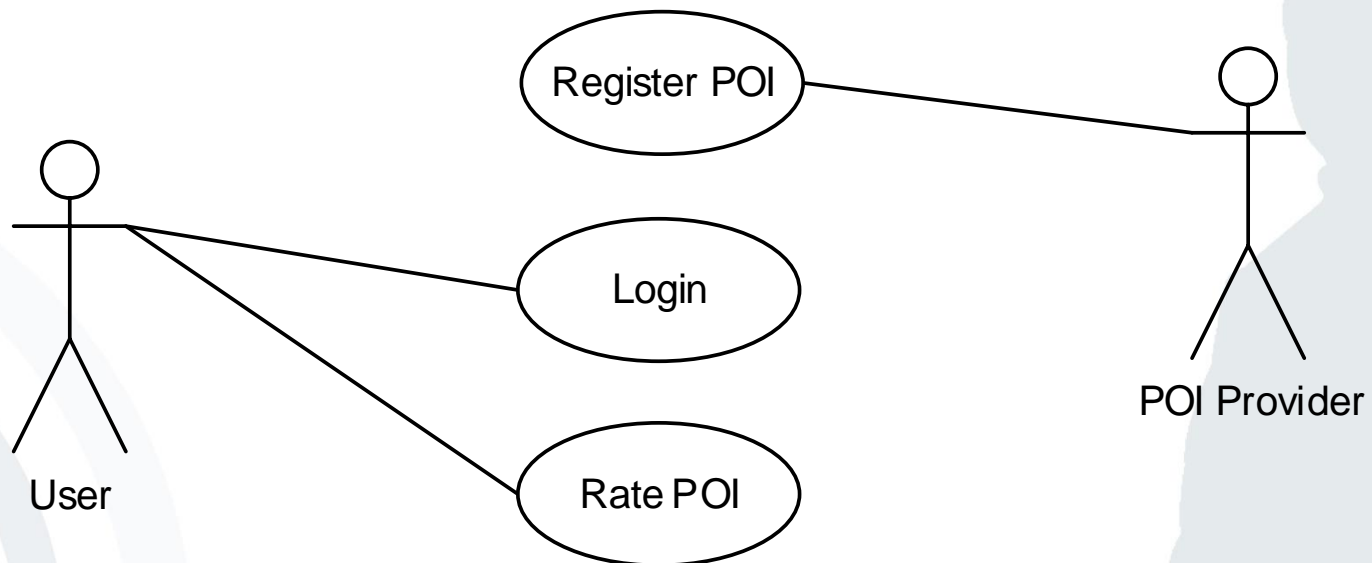
} Static elements

} Dynamic elements

} Architectural elements

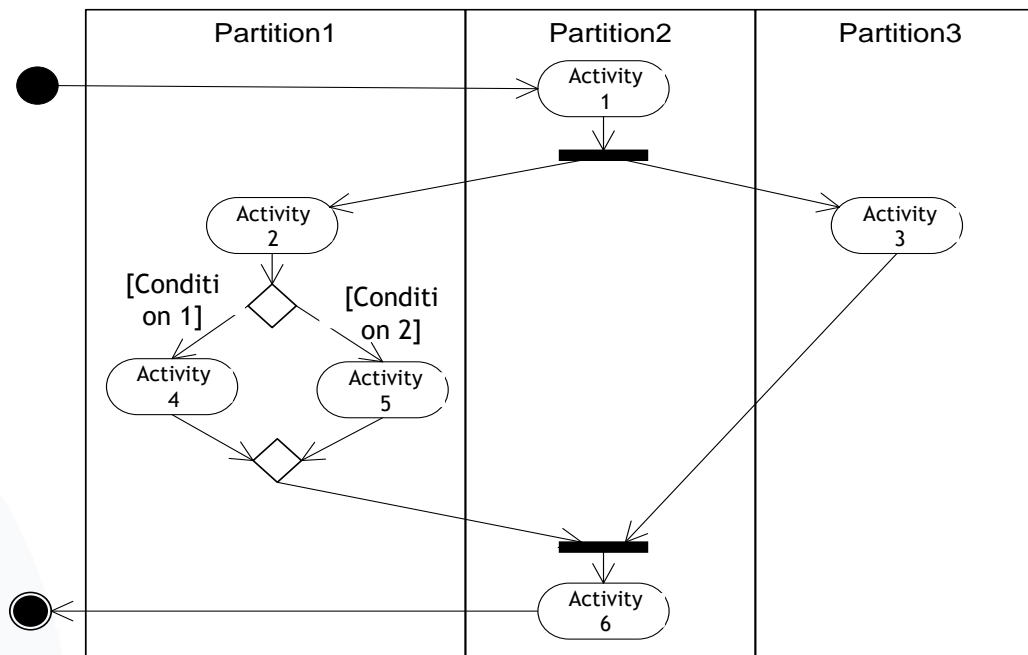
Use case diagrams

- Use cases describe the functionality, which a system has to provide
- The sum of all “use cases” comprises the technical requirements of a system.
- Use cases define the interfaces between a user and the system
- Specification is developed together with the client/customer

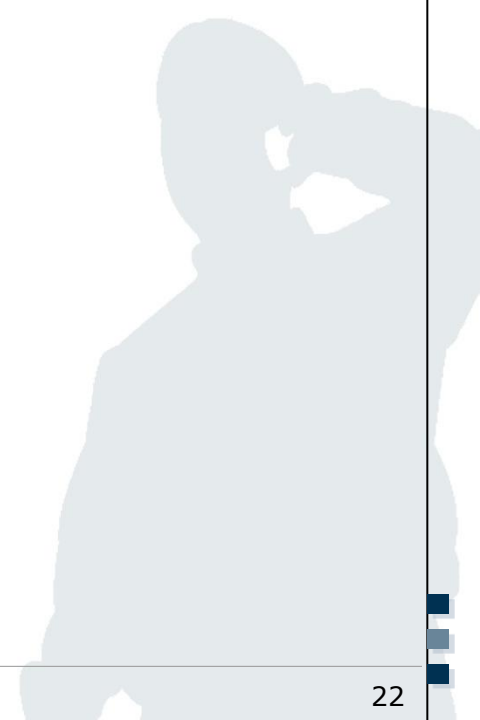


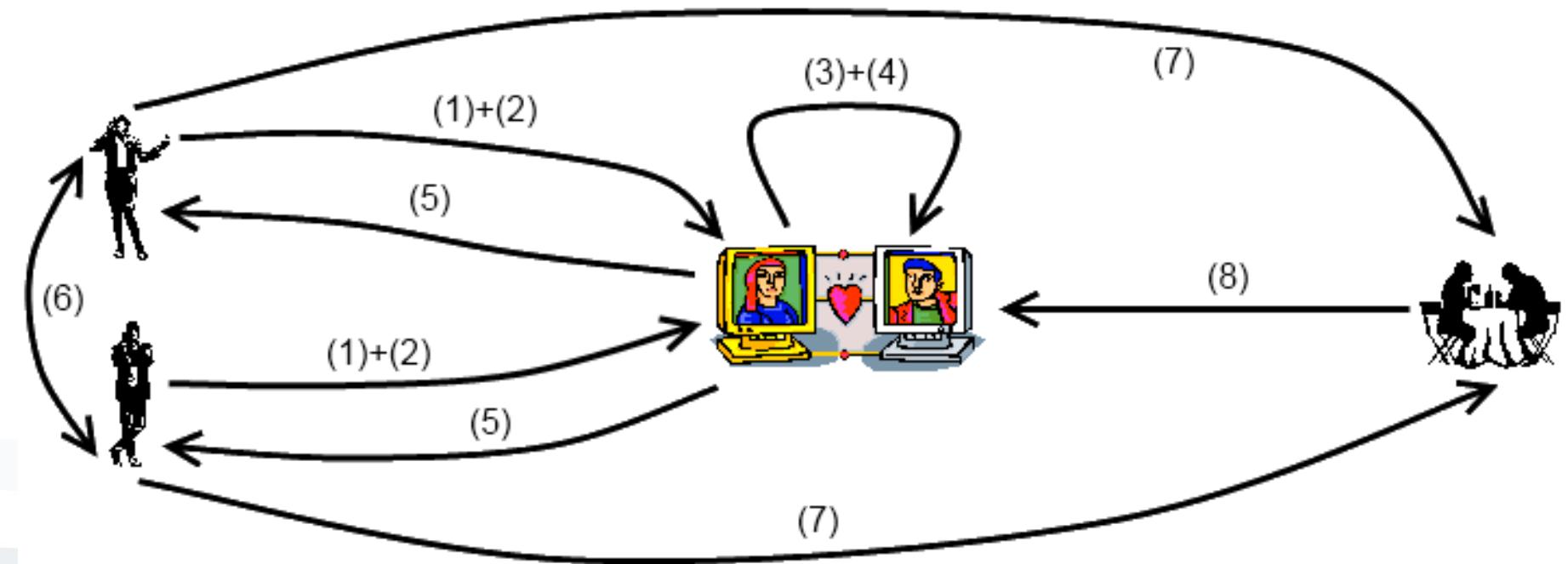
Activity diagrams

- Activity diagrams are used to model workflows in a system.
- Central element: Activity
An activity is an “action” within a process.
- Activities are structured by responsibilities.

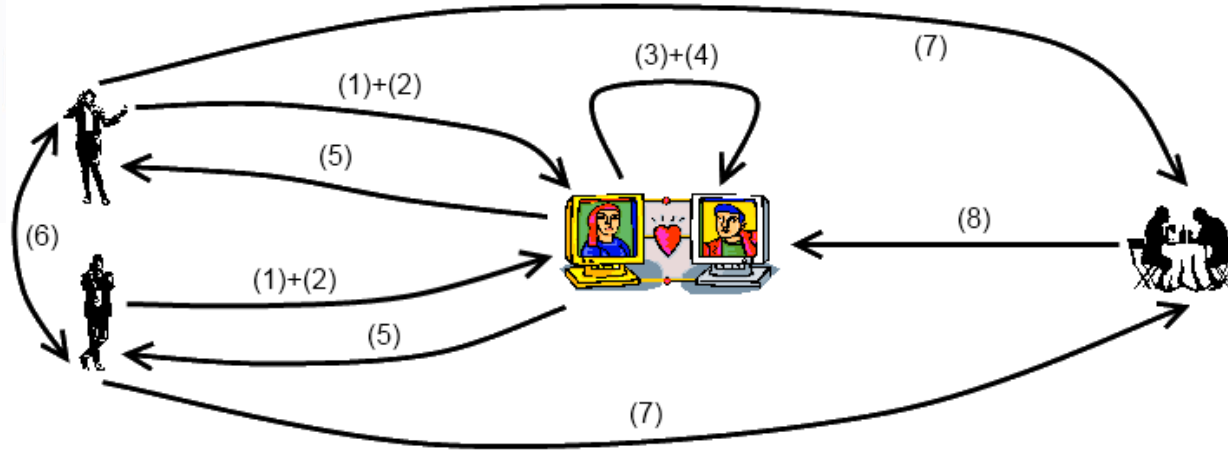


4 b) Develop a **use case** and an **activity diagram** for the InstaMatch® service based on Figure 1 of the InstaMatch scenario.





Exercise 3 b): Unified Modeling Language



1. Users register at InstaMatch®. Thereby, they receive their pseudonyms and submit their personal profile information. Subsequently, InstaMatch® attempts to certify the profile attributes of the users.
2. In order to start searching for a date, users have to activate the InstaMatch® app on their mobile device.
3. InstaMatch® attempts to find other InstaMatch® users in close proximity who are also currently looking for a date.
4. InstaMatch® matches the personal profiles of all users in close proximity with each other.
5. If there is a match, InstaMatch® informs the corresponding users by presenting them with a list of matching pseudonyms.
6. InstaMatch® enables matching users to communicate with each other using text messages, chat or voice.
7. If users want to arrange a meeting, InstaMatch® suggests a list of appropriate meeting points based on the personal interests of the corresponding users as well as their current geographic location. Then, InstaMatch® navigates the users to their meeting point.
8. After the date, the users can rate their date on the InstaMatch® app. This rating is used to improve their next date matching process.

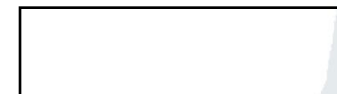
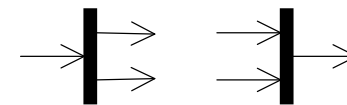
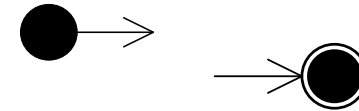
Use case diagram



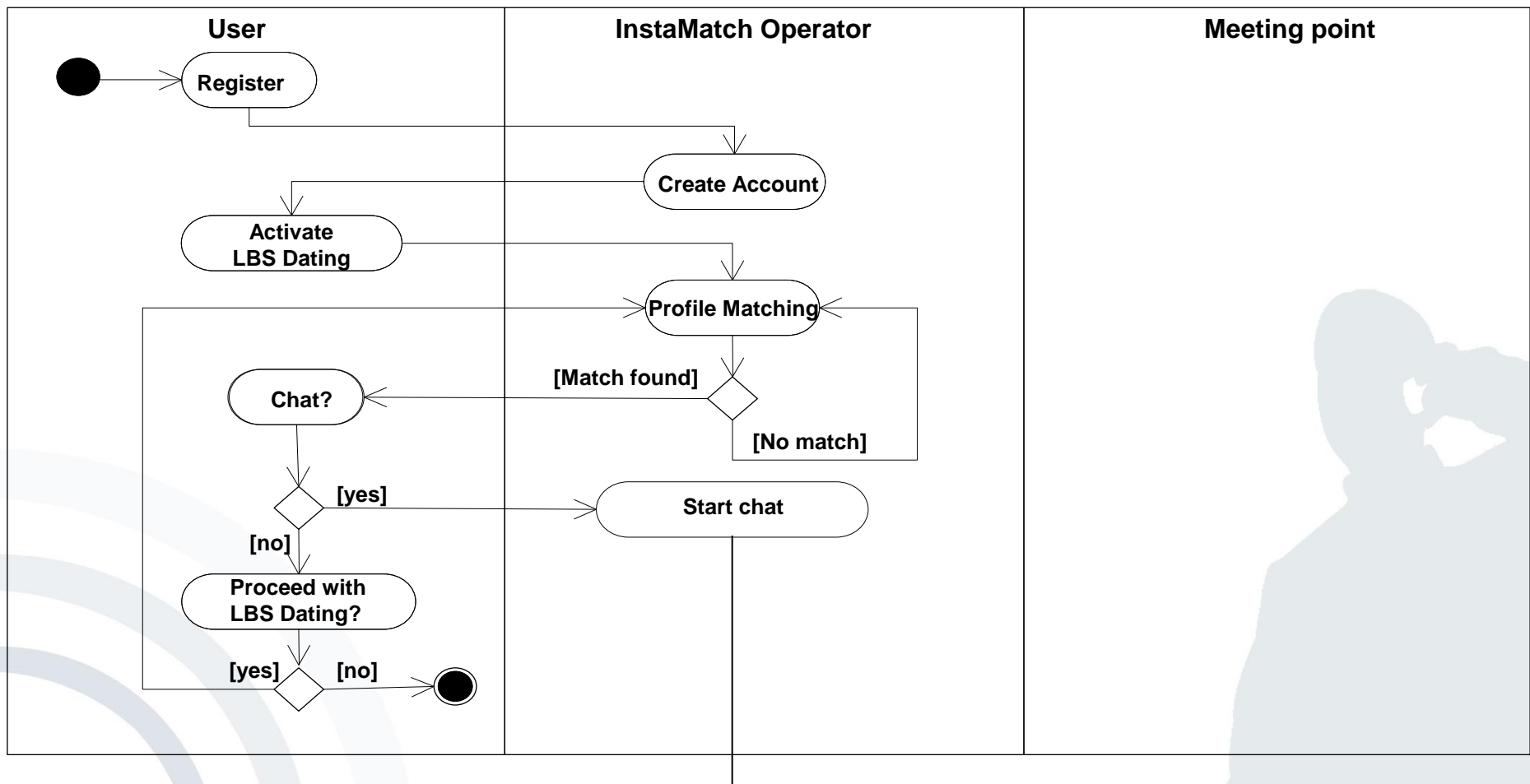
Repetition: Activity Diagram Notation Elements

Notation elements

- Initial state/final state
- Activity
- Decision
- Split/join
- Responsibility
- Activity flow



Activity diagram (1/2)



Activity diagram (2/2)

