SAARLAND UNIVERSITY ARTIFICIAL INTELLIGENCE
Dr. Álvaro Torralba, Prof. Wolfgang Wahlster
Dr. Cosmina Croitoru, Daniel Gnad, Marcel Steinmetz
Yannick Körber, Michael Barz
Christian Bohnenberger, Sören Bund-Becker, Sophian Guidara,
Alexander Rath, Khansa Rekik, Julia Wichlacz, Anna Wilhelm

Exercise Sheet 9.
Solutions due Tuesday, **July 3**, 16:00 – 16:15, in the lecture hall.[1]

Exercise 33. (7 Points)

Draw a NIKL graph (subsumption relation) for the following classes and concepts of Disney characters, in particular the animals. Select the (sub-)concepts from the following list:

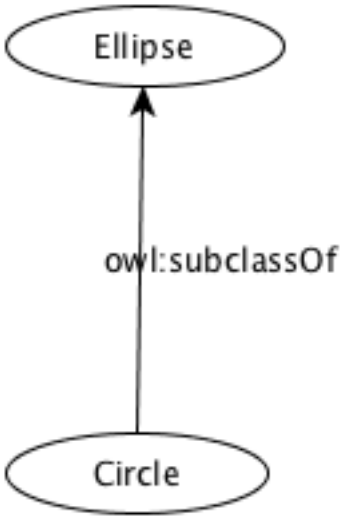
`Animals, mammals, reptiles, Batman, Pascal, humans,`
`arthropod, birds, fish, Dodo, Nemo, sloths, crabs, snakes, fairy, Sebastian,`
`Tinker Bell, Kaa, Sid, Flash, bats, butterfly, Anna, Kanga,`
`Roo, kangaroo, marsupials, pinguine, Skypper,chameleon, Thing`

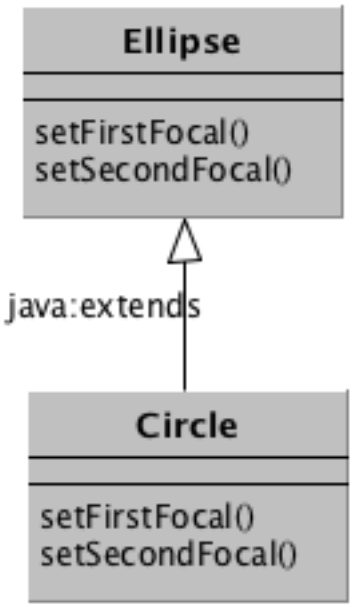
- Describe two **coverings** and mark it graphically.
- Describe a **disjoint class** and mark it graphically.
- Explain where in your graph you can find a **partition** and mark it graphically.
- Add two **roles** to your graph and one **inverse role**. If necessary, you are allowed to extend the graph with some new concepts.

[1] Solutions in paper form only, and solution submission only at the stated time at the stated place. At most 3 authors per solution. All authors must be in the same tutorial group. All sheets of your solution must be stapled together. At the top of the first sheet, you must write the names of the authors and the name of your tutor. Your solution must be placed into the correct box for your tutorial group. Also, you should write the solutions of the exercises in order, in particular, do not interleave parts of different exercises otherwise we may oversee part of your solution. Please, don't use red ink, preferably use a black or blue pen instead. If you don't comply with these rules, 3 points will be subtracted from your score for this sheet.

Exercise 34. (3 Points)

- Explain the difference between A-Box and T-Box in your own words and give at least two examples for each A-Box and T-Box from the pizza ontology `http://protege.stanford.edu/ontologies/pizza/pizza.owl`. You can use Protege (installed in the VM) to visualize the ontology (File; Open from URL).
  Can you also find some examples in the first exercise?
- Compare A-Boxes and T-Boxes to concepts in object oriented programming. What are the differences?
- Explain why circle is a subclass of ellipse. Explain why a circle-class should not extend an ellipse-class in object oriented programming[2]





[2] In OOP one solution could be aggregation using the circle class.