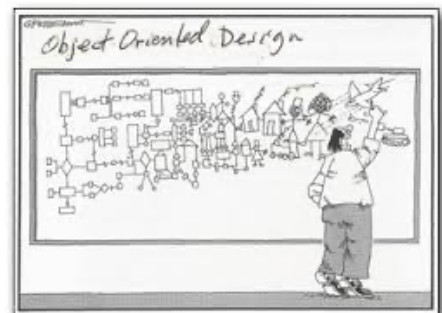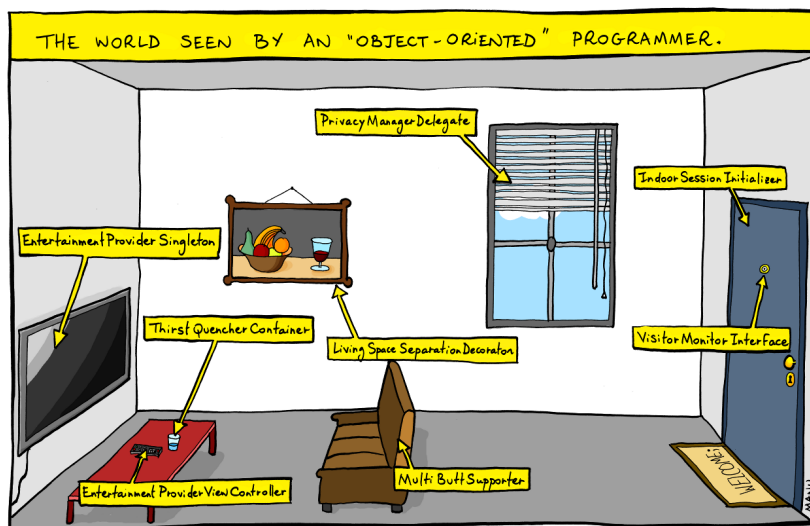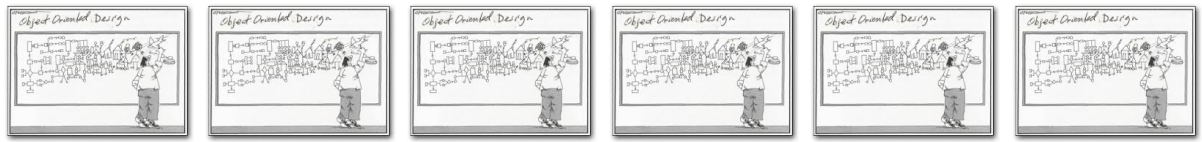# Object-Oriented Principles

Problem Booklet

Foreword

This booklet presents a problem which will support the introduction of the "OOD and Programming" Course of the GPhy Master. This course uses the "Learning with Problems and Projects" pedagogical approach (LPP), which requires you to learn through problem solving or project achievement.

This problem aims at introducing the Object-Oriented Principles.

The project is split in several steps, which you will perform in groups, either with or without the help of tutors. Sometimes, you will be asked to give some feedback on your work for a predefined deadline. Most resources and assignments are available on the UPdago system, which follows a precise timeline in terms of deadlines. You need to follow it strictly, in order to avoid penalties to your final grade.

How to work with LPP?

You need to organize your group by defining roles for each member (you may change roles during each step if you so wish):
- A group leader, in charge of group animation
- A "scribe", in charge of writing down the group work results
- A "time master", in charge of ensuring the timeline is respected

Each sequence (generally 4 hours) must be organized as follows:
1. Working together, you need to identify the main objectives of the step, and to split the work between the different group members (Approximately 1h).
2. Each group member needs to achieve his/her part separately or by shorter groups (Approximately 2h).
3. Together you share results and experiences, and elaborate the deliveries (Approximately 1h).
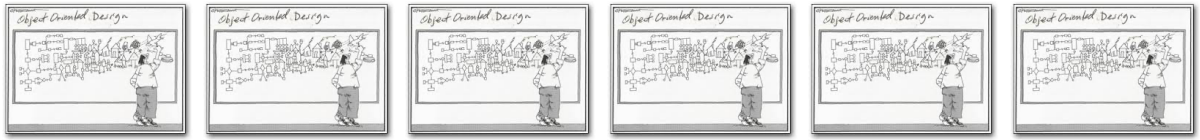
What are the objectives of LPP?

The objectives of LPP are… learning, learning, learning! This means that you (the group) succeed if **<u>every</u>** group member acquires the competencies that are listed for the project. Group members must share their findings and understandings, in order to everybody to progress the same way. The evaluation will take into account the knowledge of all members, not simply the end result.

Objectives

At the end of this problem, you are supposed to raise the following main objectives:

- **Managing a problem using the LPP approach**
- Using the BlueJ environment correctly and efficiently for class and object inspection
- Explaining the main principles of object-orientation through an efficient Prezi presentation

The context

In this section, you can find the problem context:

Subject

Object-Oriented Principles (Design/Programming) is a very important concern for IT experts. Using them properly requires a good understanding, and a clear overview of their characteristics, advantages, and even drawbacks. For many years, programming languages have been designed, such as object-oriented design methods and languages. Organizing their knowledge of OO is very important for software practitioners.

Your job

Your final job consists in designing a Prezi presentation that will expose and defend your understandings of Object-Oriented Principles.
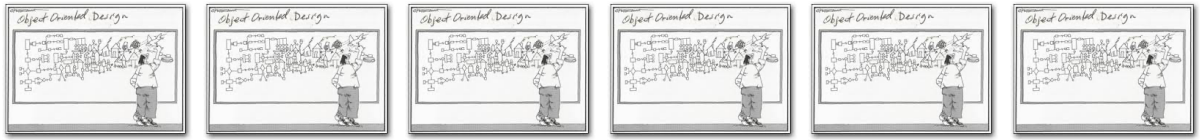
Learning objectives

The different competencies you are supposed to master are the following:
- COO: Explaining Object-Oriented Principles
- COO: Characterizing OO Programming and OO Design
- POO: Creating instances with BlueJ
- POO: Inspecting instances with BlueJ
- POO: Interacting with instances with BlueJ
- TRSV: Realizing efficient Prezi presentations
- TRSV: Interacting in groups
- PROF: Using the English language in professional situations

Resources

You can find lot of resources on UPdago:
- Suggested web pages
- Global course
- Lots of laboratories to understand OOP

Step 1: Object-Oriented History and Concepts

In this first step, you need to search for the Object-Oriented concepts.

Your job

Your job consists in writing a synthesis of Object-Oriented Principles.

Resources

- 3 Wikipedia pages on OOx
- Slides that illustrate the subject
- Short videos of BlueJ

Schedule

- 15': Organize your group (group leader, scribe, timekeeper)
  - Partial deliverable: a short note with the group organization
- 30': Browse rapidly the sources, and split the work in tasks, and allocate them to every people
  - Partial deliverable: a description of the task allocation
- 45': Individual work according to task allocation
  - Partial deliverable: individual short notes
- 30': Feedback from every group member
- 30': Write the global synthesis

Deliverables

- A 2 pages pdf document, which synthesizes the different OO concepts, including the first two partial deliverables. Upload it on Updago (one by group)