# Worksheet 1.2

For this worksheet you are expected to complete two software design exercises. For each exercise you will be given a requirements specification (a short textual description of a programming problem). Using this specification, you should identify classes, data members and behaviours and record these correctly in a UML class diagram. There is no expectation that you include any associations between classes in your diagram. However, if you do attempt to do this your solution will be reviewed by the tutor and feedback given.

## Exercise 1: Let’s have a cuppa, eh!

**Difficult Level: ★★ Duration: 30-60mins**

A tea-drinker requests a cup of tea. The tea-maker checks the kettle is full of water. If not, the kettle is filled with water. The kettle is plugged into an electrical socket and is switched on. The tea-maker asks the tea-drinker what tea they would like (Darjeeling, Assam or English Breakfast Tea). If not available an alternative is offered. Does the tea-drinker want milk (cow’s or soya)? Is the requested milk available and fresh? Does the tea-drinker want sugar? If so, how many? The tea-maker checks if there is a clean cup available. If not, they empty and clean a cup. The tea-maker adds the tea-bag to the cup and waits for the kettle to boil. Once the kettle is boiled, the tea-maker fills the cup and waits for the tea to infuse. Once infused, the tea-maker removes the tea-bag and adds the milk and sugar to the cup. The tea-maker stirs the cup contents with a spoon and hands to cup to the tea-drinker. The tea-drinker drinks the tea.

## Exercise 2: University of life

**Difficult Level: ★★ Duration: 15-30mins**

The UWE community can be described as follows. The community consists of employees, students and alumni. Employees can be divided into Administration Staff, Academic Staff, Researchers and Operations & Security. Every employee has an employee number and job title. Academic Staff and Researchers are associated with a specific faculty. The University has four faculties (ACE, FBL, FET and HAS). A proportion of Academic Staff’s time is allocated to teaching. Researchers will have a main research project on which they work. Students are classed as undergraduate or post-graduate and may study part-time or full-time. Post-graduate students will have a record of their undergraduate degree. Every student will have a student id and a programme of study (such as BSc Computing or MSc Software Engineering). Alumni will have completed a programme of study with the University and may still have a valid student id.

The following eleven classes have already been identified for you: ***CommunityMember, Student, Alumni, Employee, Undergrad, Postgrad, AdminStaff, FacultyStaff, OpsAndSecurity, Researchers*** and ***Academics***.

## Further reading and activities

Watch the [Core Concepts](http://www.lynda.com/Java-tutorials/Why-we-use-object-orientation/96949/106059-4.html) section of the Foundations of Programming: Object-Oriented Design course on Lynda.com [26m 14s]