

### Practical

1.a) The language of the problem is all about windows and how they behave on a simulated screen; the windows have a position, width and height. We need to be able to describe how to create, move and reshape windows, whether the window can be created in a given space, and how multiple windows interact with each other and the screen. For this we need to describe how much space is available between edges of windows and the screen. This will allow us to check if a window has enough space to be created, or how much the window can move in any direction. The windows can also move other windows if there is space to do so, so we will need to describe a situation where the edges of windows are touching and how much space is available around their combined area. The simulator needs to be able to accept commands, these commands are described by the operations we can perform on the windows and a command to exit the system, namely open, close, resize, move windows and quit to exit.

1.b) The types we need are:

A screen type with the width and size parameters of the screen

A window type with width, height and position parameters of the windows. This type may also hold information about whether multiple windows are in contact with each other, thereby creating a poly-window shape with given dimensions.

A User action type describing the different operations that can be performed on the windows by the user

A space type representing the available space on the screen. This could be achieved by breaking the available space up into rectangles of available space with coordinates and size, similar to windows.