Problem sheet 4

Course Fundamental Computer Science, Dr. Holger Kenn
e-mail: h.kenn@iu-bremen.de, tel.:+49 421 200 3112

1.) After having implemented the instant messenger application last week, your task is to document the application. As a starting point, use messenger.tgz from the course website.

a) Document the class MessageWorker using DoxyGen. Remember not to document how something works but what is done and why it is done. The output format of the documentation should be a pdf document created by running pdflatex on the doxygen-generated latex document.

b) Draw a class (inheritance) diagram for all classes used in the program. Document the MessageWorker class including all member functions, member variables, relations to other classes etc. using UML. (You do not have to include member functions or variables that are not changed when inherited. These would be documented in the base class.)

(5p)

2.)

For doing this, you need to read the documentation of gdb and ddd. for gdb, just type info gdb on one of the clamv machines, for ddd, check
`http://www.gnu.org/software/ddd/`

a) In order to debug a program with gdb, it is necessary to tell the compiler to create debugging information. Find out how and modify the makefile of the messenger application accordingly. It might also be clever to switch off the optimized code generation. Find out how and modify the makefile again. (It is sufficient to specify the changed lines in the makefile and explain the effect of the changes.)

b) In order to allow different groups to communicate independently, somebody has modified messenger.cpp so that people can give the port to use as an argument. Unfortunately, if you run the program without specifying a port, it crashes. The modified lines look like this:

```
thesender = connectUDP ("255.255.255.255", argv[1]);
thereceiver = passiveUDP (argv[1]);
```

Which function call in the program causes the segmentation fault? Why? Modify the program so that it also runs if no port number is specified by using the default port then.

(5p)