Operating Systems
Jacobs University Bremen
Dr. Jürgen Schönwälder

Course: 320202
Date: 2015-04-22
Time: 15 min.

Quiz Sheet #5

Problem 5.1: *sockets* (2+1+2 = 5 points)

a) What is the purpose of the following `struct`s?

- `struct sockaddr`
- `struct sockaddr_in`
- `struct sockaddr_storage`

b) What does it mean to `connect()` a connection-less datagram socket?

c) What is the name of the library function converting names to (binary) socket addresses? Which function converts (binary) socket addresses to printable strings (either names or numbers)?

Problem 5.2: *pipes*   (2+3 = 5 points)

a) What is result produced by running the following shell command in an empty directory? Explain.

```
mkfifo a; echo a > a | cat a
```

b) Assume all system calls succeed at runtime. What is the result produced by the following program? Explain. Note: If the behavior of the program is unclear, discuss the different options and their pros and cons.

```
#include <stdlib.h>
#include <unistd.h>

static void doit()
{
    char c;

    (void) read(STDIN_FILENO, &c, 1);
    c++;
    (void) write(STDOUT_FILENO, &c, 1);
    exit(0);
}

int main(int argc, char *argv[])
{
    int fds[2];

    (void) pipe(fds);
    if (fork() == 0) {
        (void) dup2(fds[0], STDIN_FILENO);
        doit();
    }
    if (fork() == 0) {
        (void) dup2(fds[0], STDIN_FILENO);
        doit();
    }
    (void) write(fds[1], "01", 2);
    return 0;
}
```