Operating Systems
Jacobs University Bremen
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Course: 320202
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Time: 15 min.

Quiz Sheet #1

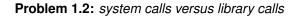**Problem 1.1:** *process creation using fork()*   (1+1+1+2 = 5 points)

Consider the program shown below and explain what each code block does. In which situations
does it print `wow`? Assume that all system calls succeed at runtime and that process identifiers are
allocated sequentially.

```c
#include <stdlib.h>
#include <stdio.h>
#include <sys/types.h>
#include <unistd.h>

int main()
{
    pid_t pid;

    if (getpid() % 2) {
        if (fork() == 0) {
            exit(EXIT_SUCCESS);
        }
    }

    pid = fork();
    if (pid == 0) {
        exit(EXIT_SUCCESS);
    }

    pid = fork();
    if (pid > 0 && (pid % 2) != 0) {
        (void) puts("wow");
    }

    return EXIT_SUCCESS;
}
```

Problem 1.2: *system calls versus library calls*   (1+1 = 2 points)

a) Briefly describe the major differences between a library function call and a system call.

b) Should a function to change the priority of the calling process be implemented as a library call or as a system call? Explain why.

Problem 1.3: *programming languages and tools*   (1+2 = 3 points)

Briefly answer the following questions:

a) Which tool can be used to trace the system calls made by a process?

b) What is the difference between a statically linked program and a dynamically linked program? What are the benefits and drawbacks of dynamic linking?