UNIVERSITÉ DE FRIBOURG
UNIVERSITÄT FREIBURG

S08: File System

A. Schaller

16-896-375

Prof.: Dr. Luggen Michael

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1 Create the function to_upper(s)

Create the function to_upper(s) which takes a String s as input and returns a String where all ASCII letters (a-z) are transformed to upper case, the other characters stay the same.

Question 1. *Create one version which uses toupper(c) from <ctype.h>*

```c
#include <ctype.h>
#include <stdlib.h>
#include <string.h>

char * lib_upper (char * string) {
    int len = strlen(string);
    char * new_string = malloc(len);

    for (int i = 0; i < len; i++) {
        new_string[i] = toupper(string[i]);
    }

    return new_string;
}
```

Question 2. *Then extent the program with a function implementing your self toupper(c).*

Hint: To reimplement toupper(c) inspect closely the ASCII table of the lower, and upper case letters. The solution can be realized with simple arithmetic!

```
char * own_upper (char * string) {
    int len = strlen(string);
    char * new_string = malloc(len);

    for (int i = 0; i < len; i++) {
        char c = string[i];
        new_string[i] = c;
        if (c >= 'a' && c <= 'z') {
            new_string[i] += 'A' - 'a';
        }
    }

    return new_string;
}
```

Small main function to print our results:

```
#include <ctype.h>
#include <stdio.h>
#include <stdlib.h>
#include <string.h>

int main () {
    char s1[] = "Français";
    char s2[] = "spaß";
    printf("%s -> lib upper: %s\n", s1, lib_upper(s1));
    printf("%s -> lib upper: %s\n", s2, lib_upper(s2));

    printf("%s -> own upper: %s\n", s1, own_upper(s1));
    printf("%s -> own upper: %s\n", s2, own_upper(s2));

    return 1;
}
```

2 Write a program which writes to stdout and stderr.

Question 1. *Write a tiny program which outputs alternating "hey!" to stdout and then "ho!" to stderr. In between the two output of the program shall sleep for 1 second.*

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

int main () {
    while(1) {
        fprintf(stdout, "hey!\n");
        sleep(1);
        fprintf(stderr, "ho!\n");
        sleep(1);
```

```
    }
}
```

Question 2. *Write a bash command which writes all outputs of the stdout to the file hey.txt and all the output of the stderr to the file ho.txt*

```
./ex2 >> ./hey.txt 2>> ./ho.txt
```

3 Project P01: Linked Data In-Memory Store

After the project set-up with some dummy information try to define some data "by hand" and start to work on the match() function.

- *Define a data structure which you then fill with some example information statically (see the example from the project description[1]). Make sure to define it outside the match() function.*
- *As a first step see if you can printf() all the triples which match the char* S variable.*

[1] https://unifr.coursc.ch/#projet (visited on April 2021)