Johannes Kepler University Linz
LIT – Secure and Correct Systems Lab
S. Rass · S. Ahmad · M. Schwaighofer ·
K. Feichtinger · D. Zaitsev

PR Systems Programming
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Class dates: see KUSSS

Excercise Sheet 7

Warmup (optional): Let the following code run, and explain why it outputs hello four times in total before printing "world".

```
int i;
for(i == 1; i <= 3; i++)
       printf("hello ");
       printf("World!\n");
```

Correct the code so that it outputs "hello World!" three times, as desired.

Exercise 7.1. Add the following functionalities to the existing beverage vending machine, whose template code you find attached `vending-machine-skeleton.c`

- There are several drinks to choose from: water, lemonade and beer.
- Water costs 0.50 euros, lemonade 1 euro and beer 2 euros.
- Specifying the amount to be paid or checking the payment must be done with a `switch case` statement that includes the handling of invalid choices. In that case, print an error message and terminate the program (returning an error code to the operating system).
- Extend the skeleton such that it keeps asking for more money until the right amount is paid.
- Give change, if there was an overpayment.

This is an example output for the proposed solution:

```
Vending machine v0.1

Choose your drink:
1) Water (0,50 Euro)
2) Lemonade (1,00 Euro)
3) Beer (2,00 Euro)

Enter 1, 2 or 3: 2
please insert 1.00 Euro: 0.2
not enough!

please insert 0.80 Euro: 0.2
not enough!
```

```
please insert 0.60 Euro: 0.5
not enough!

please insert 0.10 Euro: 0.5

Thank you! Enjoy your drink.
Here is your change: 0.400000
```

Exercise 7.2. Write a function that computes the following recursive number sequence: $f_1 = 0$, $f_2 = 1$ and $f_{n+1} = f_n + f_{n-1}$. Do two implementations, one as a recursive function, the other as an iteration inside a single function call, and submit both your code files as a single ZIP file in Moodle.