Lectures

- In week 07 there are no lectures.

- The 2nd mandatory assignment will be put on the course homepage during week 07.

Tutorial Session - C Programming

- On the course homepage the source code of several small C-programs that were used in the lecture is provided. Analyse the following, which was not discussed in the lecture, (test12mod2.c) and discuss the efficiency of the code given below wrt. correctness, readability, and efficiency of the code. Is it more efficient than the naïve recursive approach to compute the power of a number as presented in the lecture? (test12.c).

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

float power(float x, uint32_t exp);

float power(float x, uint32_t exp)
{
  float result;
  /* base case */
  if (exp == 0)
    return 1.0;

  result = power(x, exp >> 1);
  result = result * result;

  if (exp & 1)
    result = result * x;
  return result;
}

int main(int argc, char **argv)
{
  float p;
  p = power(10.0, 5);
  printf("p = %f\n", p);
  return 0;
}
```

- The following is the code to allocate memory for a 2-dimensional array of fixed size 8×8.

  – Where in the memory is the matrix stored?

  – Provide the code for a variant of the code that allocated the memory dynamically (see also slide set). Where is your dynamically allocated memory stored?

```c
#include <stdio.h>

int main()
{
  int x;
  int y;
  int array[8][8];

  for ( x = 0; x < 8; x++ ) {
    for ( y = 0; y < 8; y++ )
      array[x][y] = x * y;
  }
}
```

- Follow the C-tutorial for FILE I/O on https://www.cprogramming.com/tutorial/cfileio.html and answer the quiz questions.

- On the homepage you find 4 different implementations of a methods for swapping the value of two variables. Use the code visualizer in order to find which of the 4 implementations are correct, in which are not. Go stepwise through the all 4 provided implementations, and make sure you understand how pointers are used.