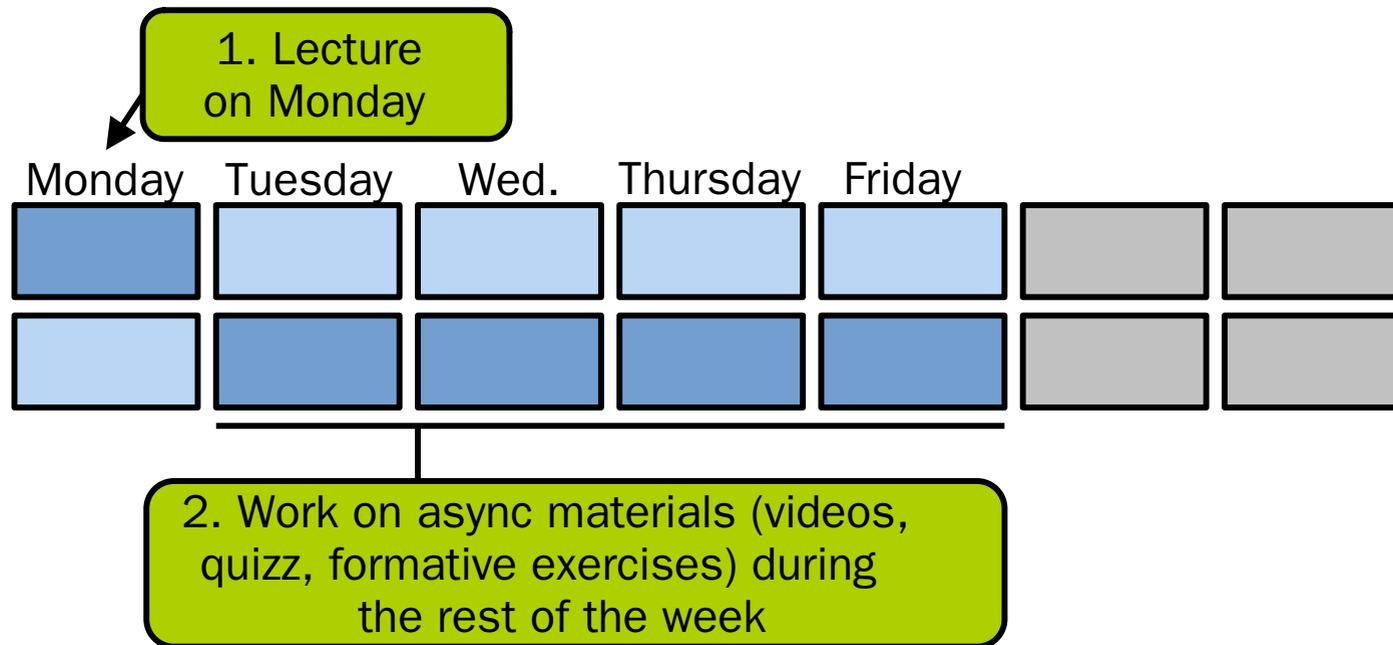


COMP26020 Programming Languages and Paradigms Part 1: C Programming

Logistics

Part 1/C Organisation

Blended approach: live sessions + asynchronous videos & exercises



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4. Support sessions

- Come if you have any questions about the lecture materials and formative/summative exercises
- Every other week starting week of 30/09, Wednesday 11am-12pm and Thursday 9am-10am in *Kilburn 1.8*

Course Website

On Blackboard: <https://bit.ly/3B70LCE>

- **Everything regarding part 1/C can be accessed from there:**
 - Schedule (what to do each week)
 - Videos, including live sessions recordings
 - Lecture notes and lecture slides
 - Summative lab exercise brief
 - Formative autocorrected programming exercises
 - Formative quizzes
 - Discussion board
 - Reading list

Required Software

All programming exercises should be done in a Linux  x86-64 (i.e. Intel CPU) environment with GCC 10/11/12. Several solutions:

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- **MacBooks with non-Intel (i.e. M1) CPUs:** some solutions given next but the general advice is to come on campus and use lab machines

Lecture Videos

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- Using the bottom-right links you can:
 - Download the file: click on the blue path
 - Run it in your browser in a Programiz sandbox 
 - Get instructions on how to load and run it in a container that should run on Mac/Windows by clicking on the GitHub logo 

```
#include <stdio.h>

int main() {
    printf("hello, world!\n");
    return 0;
}
```

00-logistics/sample-code.c  

Feedback on Lectures

- Each slides deck ends with a link to a small feedback form
- It's fully optional and anonymous, feel free to use it to tell what you think about the lecture in question
 - Your feedback will help to make the course better!

Picking a Programming Paradigm

- **Some paradigms are (much) better suited than others to solve a given kind of software engineering problem**
- Choosing a paradigm and a language to solve a given software engineering problem has **huge consequences in terms of the design and behaviour of the solution**, impacting among others:
 - Code structure and modularity, clarity/complexity to understand, amount of LoC

Lab Assignment (marked)

- Subject is already on Blackboard: <https://bit.ly/3ZsgPZH>
- Development of a matrix processing library in C
- Weight: 6.5% of the final COMP26020 mark
 - **50/50 coursework/exam weight split for the C part**

Autocorrected Programming Exercises (not marked)

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 - Divided into **essential** and **additional** exercises
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- Accessible from the website, along with instructions on how to install `check50`: <https://olivierpierre.github.io/comp26020/exercise-set-1.html>

Quizzes

- A small quiz to complete each week, after having seen all the lecture materials
 - On Blackboard: <https://bit.ly/47qB4sV>
 - Formative (unmarked)

submissions (78%)	submissions (70%)
16-50	17-51
105-134	119-146
59-84	61-88
8-13	8-13
141-153	152-164

```

int main(int argc, char **argv){
    //Check number of command line arguments
    if(argc != 4){
        printf("ERROR: incorrect number of arguments\n");
        printf("Please use: %s <M> <N> <seed>\n", argv[0]);
        return -1;
    }
    //Check it is a digit
    if(!is_number(argv[1]) || !is_number(argv[2]) || !is_number(argv[3])){
        printf("ERROR: invalid argument\n");
        printf("Please use: %s <M> <N> <seed>\n", argv[0]);
        return -1;
    }
    //Check it is valid number
    if((atoi(argv[1])<=0) || (atoi(argv[2])<=0) || (atoi(argv[3])<0)){
        printf("ERROR: invalid value\n");
        printf("Please use: %s <M> <N> <seed>\n", argv[0]);
        return -1;
    }

    // get the value of command line arguments
    int m = atoi(argv[1]), n = atoi(argv[2]), seed = atoi(argv[3]);

    //initialise
    int **matrix_1;
    int **matrix_2;
    int **result;

    //generate the matrix
    matrix_1 = matrix_generate(m, n);
    matrix_2 = matrix_generate(n, m);
    result = matrix_generate(m, m);

    //check if fail allocation
    //if (matrix_1 == NULL) return -1;
    //if (matrix_2 == NULL) return -1;
    //if (result == NULL) return -1;

    //fill matrix with random number
    srand(seed);

    fill_random_matrix(m, n, matrix_1);
    fill_random_matrix(n, m, matrix_2);

    //setup time
    struct timeval start, stop, elapsed;

```

```

int main(int argc, char **argv){
    //Check number of argument present
    if(argc != 4){
        printf("ERROR: incorrect number of arguments\n");
        printf("Please use: %s <M> <N> <seed>\n", argv[0]);
        return -1;
    }
    //Check it is a digit
    if(!check_digit(argv[1]) || !check_digit(argv[2]) || !check_digit(argv[3])){
        printf("ERROR: invalid argument\n");
        printf("Please use: %s <M> <N> <seed>\n", argv[0]);
        return -1;
    }
    //Check it is valid number
    // cannot have negative int
    if((atoi(argv[1])<=0) || (atoi(argv[2])<=0) || (atoi(argv[3])<0)){
        printf("ERROR: invalid value\n");
        printf("Please use: %s <M> <N> <seed>\n", argv[0]);
        return -1;
    }

    // get the value of command line arguments
    // save to variable
    int m = atoi(argv[1]), n = atoi(argv[2]), seed = atoi(argv[3]);

    //initialise
    int **matrix_1;
    int **matrix_2;
    int **result;

    //generate the matrix
    matrix_1 = generate_matrix(m, n);
    matrix_2 = generate_matrix(n, m);
    result = generate_matrix(m, m);

    //check if fail allocation
    if (matrix_1 == NULL) return -1;
    if (matrix_2 == NULL) return -1;
    if (result == NULL) return -1;

    //fill matrix with random number
    srand(seed);
    fill_matrix(m, n, matrix_1);

    fill_matrix(n, m, matrix_2);
    fill_matrix_zero(m, m, result);

    //setup time

```

How to Get Help?

- Any question? in increasing order or urgency:
 - Step 1: come to the next support session
 - Step 2: discussion boards on Blackboard
 - <https://bit.ly/3TuORsC>
 - **Do not post answers there!**
 - Step 3 or if urgent: pierre.olivier@manchester.ac.uk