

Practical Session C

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C coding, after every step, add the files to your repo:

- Write a basic C code to print “Hello World”
- Compile *hello_world.c*: `gcc hello_world.c -o hello_world`
- **Header file:** Put the declaration of the function in a header file and function definition in another C code, invoke it into main using the header file
- Write, compile and execute a code to compare two values using *if else* and print the larger value
- Write, compile and execute a code to print values of a variable (1,2,3 ... 100) using *for* loop
- Write, compile and execute a code to print values of a variable (1,2,3 ... 100) using *while* loop
- Write, compile and execute a code to assign a value to a variable and print its value and its memory address
- Write , compile and execute a code with a function which takes two arguments and returns their sum
- **Makefile:** Create a makefile to compile *hello_world.c*
- Create an array list, search through the list to find a value

- Create an array of ORDERED list and perform binary search
- Order an UNORDERED list (ascending or descending) using Selection Sort
- Vary the input list size and time and space taken by the code using *time* or *memusage*.

Semaphores in C:

- Use *sleep(duration)* from *unistd.h* to print two lines, one 10 seconds after another
- Semaphore functionality is provided in *semaphore.h* with the object *sem_t*. Function *sem_wait(mutex)* is used to take a semaphore before critical section and *sem_post(mutex)* is used to return after critical section. *pthread.h* is used to create threads. Use *pthread.h* to create a thread which prints “Hello World”
- Extend previous example by making two threads, make one thread wait for the other in a critical section. Use *sleep(time)* to make thread spend time in a critical section.
- Extend it to three threads.

Basic WCET analysis

- Use terminal commande *time* and python library *os* to execute a piece of C code large number of times, obtain the max execution time, add a factor of safety and provide a WCET value for your code.