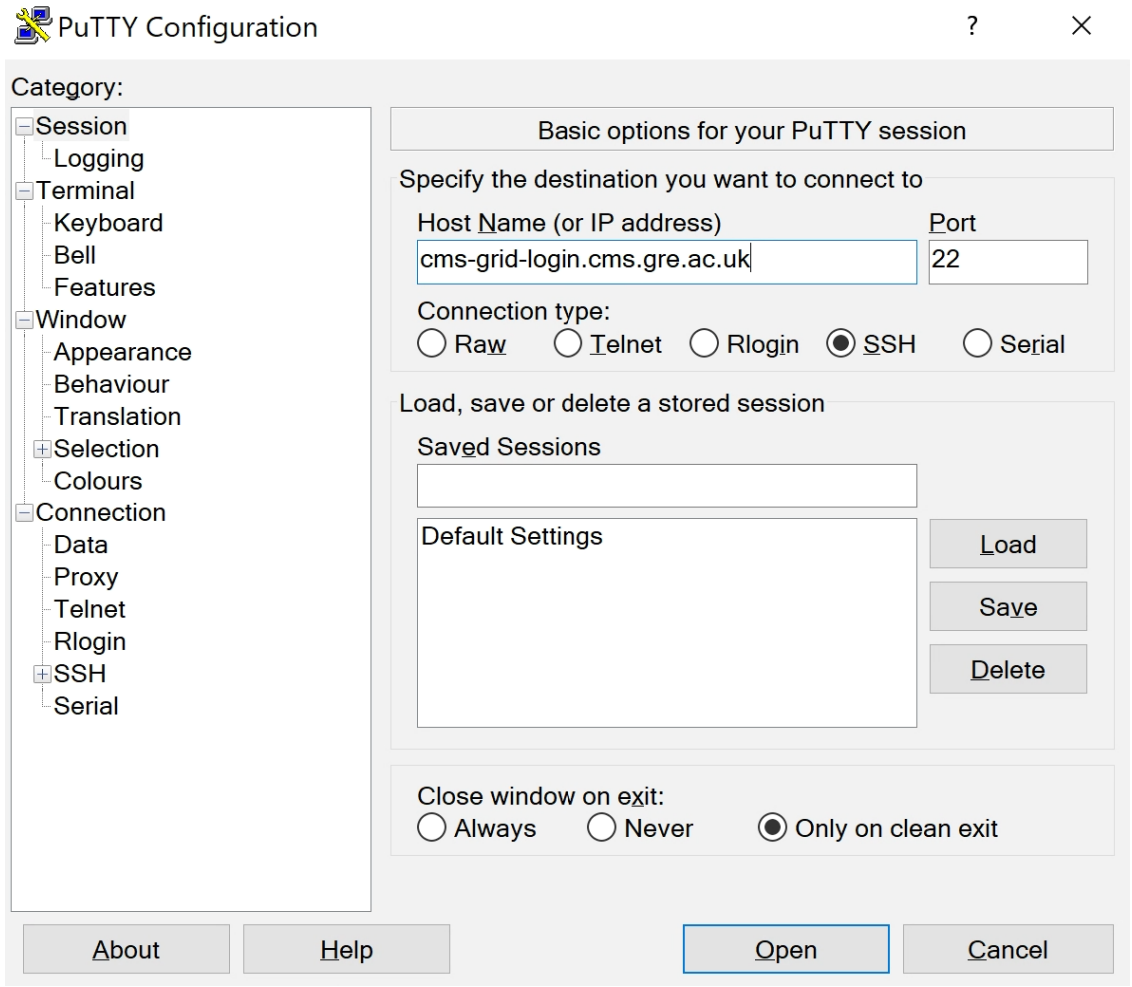
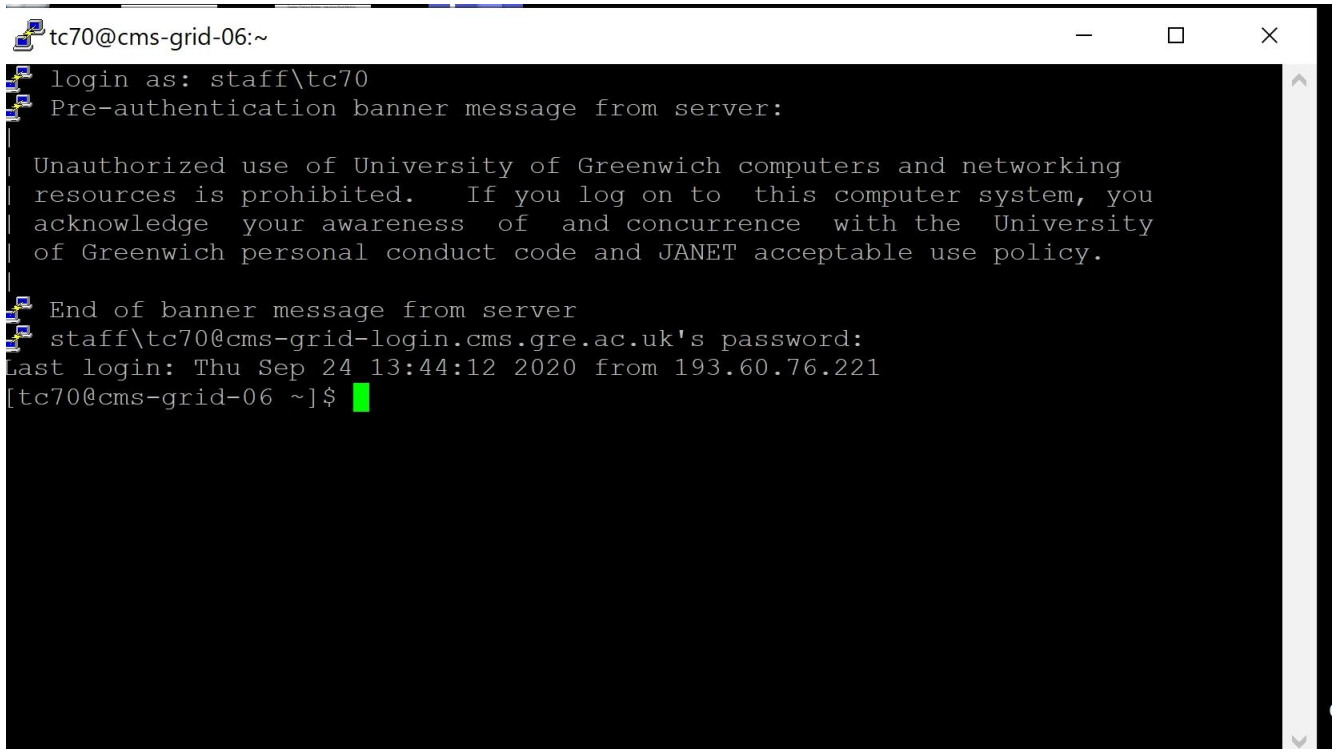
Lab: Timing Code in C

How to measure runtime in serial C code.

Login to “cms-grid” multicore nodes.





Measuring Runtime

```c
#include <stdio.h>
#include <unistd.h>
#include <stdlib.h>
#include <sys/time.h>
#include <time.h>

int main(int argc, char** argv)
{
    //The variables for the start and stop timer
    struct timeval startTime, stopTime;

    //loop variable
    int i;

    // This variable will hold the total time
    long totalTime;

    // Start timer: get current time and store it in variable startTime
    gettimeofday(&startTime, NULL);

    for (i = 0; i < 10000; i++) {
    printf("hello world\n");
    }

    // Stop timer: get current time and store it in variable stopTime
    gettimeofday(&stopTime, NULL);

    // Calculate total time by subracting the startTime from the stopTime (result is in microseconds)
    totalTime = (stopTime.tv_sec * 1000000 + stopTime.tv_usec) - (startTime.tv_sec * 1000000 + startTime.tv_usec);

    // Print the totalTime as a long integer (%ld)
    printf("%ld\n", totalTime);

    return (0);
}
```

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```
struct timeval {
    time_t      tv_sec;     /* seconds */
    suseconds_t tv_usec;    /* microseconds */
};
```

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Timing code in C

1. Download helloWorld.c from moodle upload to the unix system compile and run it
2. Do the same for measureTime.c and sumInt.c
3. Modify sumInt.c to add timings
4. Increase the loop length to 1 million. Time the code again
5. Run timings in incrememements of 100,000 loops starting at 100,000 and finishing at 1 million. How does the time increase?