Assignment 3 : Calculating the time o perform various function calls

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According to the requirements of the assignment, there are three big parts of the assignments: calculating the cost of minimal function call; calculating the cost of a minimal system call and calculating the cost of a read/write system call. For all these three part, the main idea for measuring is use "clock_gettime()" function to get the starting time and ending time, then subtract them. Because we want to get the average time, so I use "test_time" to control the testing times. Calculate all the time of these times' testing and then divide the times.

First, I define the begining and ending time for each of the part. For example, I write "struct timespc func_start, func_end: " for measuring the cost of a minimal function call.

Because the cost time is too small, I use nanoseconds as unit, so I create a function called "convert_time(struct timespec* t)" to calculate nanoseconds time.

Part I: use "func_call()" to call a empty function
Part II: use "getpid()" to get a system call
Part III: set up a pipe with parent and child process; fork a child process "pid = fork" and transfer one byte between parents and child (in parent process, write only parent process "write(pipe_process[1], &a, sizeof(a));"; in child process, read from parent "read(pipe_process[0], &a, sizeof(a));").

This is the final result: