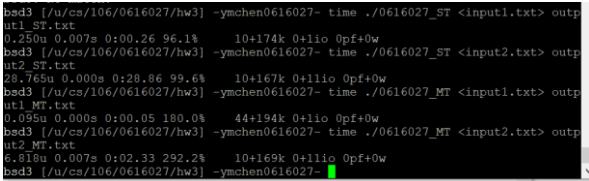
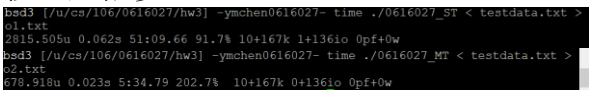


## 2019 NCTU OS HW3 report

Question	Answer
<p>Q1. Briefly describe your design for the sort and merge function and the thread management in the Multi-thread program.</p>	<p>sort 就用 bubble sort，每次從後面挑最小的放到第一個、第二個...，一直挑到最後。</p> <p>merge 就比較兩個陣列的第一個位置，誰小就放到新陣列，之後小的那個往後看一格，繼續做比較，直到兩個陣列的元素都放到新陣列。</p> <p>Multi-thread 在傳參數時只能傳一個東西，所以就把陣列和陣列長度包在一起，丟到 sort，另外 merge 是包一個二維陣列和兩個陣列長度給他，回傳都是回傳排好的陣列回來。</p>
<p>Q2. Show your thread information screenshot while running the Single-thread/Multi-thread program.</p>	 <p>The screenshot shows the output of a program comparing single-thread and multi-thread execution. It displays metrics such as user time, system time, and CPU usage for both configurations. The multi-thread version shows significantly lower user time compared to the single-thread version.</p>
<p>Q3. Show the time speedup between Single-thread and Multi-thread.</p>	<p>上面的圖 Single 跑了 28 秒，Multi 跑了 2 秒，差很多。</p>  <p>The screenshot shows the output of a program comparing single-thread and multi-thread execution. It displays metrics such as user time, system time, and CPU usage for both configurations. The multi-thread version shows significantly lower user time compared to the single-thread version.</p> <p>另外這個是我用 1,000,000 筆數字下去測的，Single 跑了 51 分，multi 花了大概 5 分多鐘，speedup 大概十倍</p>
<p>Q4. What did you learn from doing hw3?</p>	<p>關於一些 thread 的傳遞使用，感覺好複雜，不過好像也沒那麼難，網路上都有人在討論，只是要包成 struct 真的滿麻煩的，還有一些動態記憶體的配置，之前沒有好好寫過，這次花了滿多時間搞這個的，也學到了二維陣列等等的配置和刪除記憶體，還滿有用的。</p>