1.
    a. For two processing cores and 60% parallel component, N is 2 and S is 40%, or 0.4. Amdahl's Law, which is speedup <= 1/(S + (1 - S)/N), shows that speedup <= 1/(0.4 + (1-0.4)/2 speedup <= 1.428
    Speedup gain is 1.428 times.

    b. The speedup gain of an application with 4 processing cores and 60% parallel component: N is 4 and S is 0.4
    speedup <= 1/(0.4 + (1-0.4)/4) speedup <= 1.81 Speedup gain is 1.81 times.

2.
    a. You'll use one thread to handle the input/output, because the I/O is done on a single file during startup, so any thread-synchronization will result in unwanted overhead.
    b. You'll use 4 threads for the CPU-intensive portion of the application, 1 main thread, and 3 spawned threads. This is because we are assuming that CPU intensive operations are independent and can be parallelized as a result.

3.
    a. There are 5 unique processes created: one child process by parent, a process within that child process, and 3 process created by each of these existing processes.
    b. There are 2 unique threads created.

4.
    a.