IT5002 Computer Systems and Applications
Tutorial 6

1. Using Google or otherwise, research and show how bootstrapping works on Windows, LINUX or MacOS (pick ONE OS to talk about).

2. How many processes are created in the following program? Include the original process created when the program is first run.

```
for(int i=0; i<10; i++) fork();
```

3. Explain, with an example, why the highest priority task can still be interrupted by the lowest priority interrupt, and how this affects ISR design. (Hint: Interrupts are implemented in hardware in the CPU itself).

4. We know that to support multitasking we need to save the registers, program counter, stack pointers and machine status word (SREG in the lecture notes). What other pieces of information does the OS need to save about a process? Explain each piece.

5. Given four batch jobs T1, T2, T3 and T4 with running times of 190 cycles, 300 cycles, 30 cycles and 130 cycles, find:

   i) The average waiting time to run if the jobs are executed in order.
   ii) The average time to run if the jobs are executed SJF.

   From your answer and otherwise, explain the advantage and disadvantage of SJF. In particular, what if the number of jobs running is not fixed and new jobs can be added at any time?