

ECE 471 – Embedded Systems

Lecture 35

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Announcements

- HW#10 was due
- Presentations are starting
- Feel free to return borrowed hardware.



Final Preview

- Wednesday, December 15th, 9:30am - 11:30am
- Is cumulative for whole class, but concentrates on material from latter half of class. *No assembly language*
- Know the definitions of an embedded system and be able to say if a certain machine meets them.
- Know hard/soft/firm realtime



- Know the benefits/downsides of an operating system
- Security/Code Quality – mostly be aware of what things can go wrong if you are not careful when coding
- Embedded busses – know the relative tradeoffs between i2c, spi, and 1-wire. Mostly speed, distance, number of devices
- Power/Performance like HW10
- Give you some C code from one of the homeworks, comment it

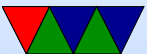


HW#10 Review

- Real Time
 - Pi3: Min 1.9us, Max 5.1us, average 2.7us
 - Load: Min 2us, Max 20ms, Avg 7ms (note Linux probably 250Hz context switch time which is 4ms)
 - chrt 70 – Min 2us, Max 3.4us, Avg 2.8us
 - Why root? Because you could make a task so high-priority nothing else could run. Problem on multi-user systems.
- Power



- Pi2 has lowest power
- Macbook air has least energy
- macbook air is fastest
- no, only Jetson TX-1 and broadwell can meet 60s deadline
- Jetson Tx-1 = $((47*13.4)+(13*2.1))*60 = 657.1 * 60 = 39\text{kJ}$
- Broadwell = $((14*29.1)+(46*10))*60 = 867.4*60 = 52\text{kJ}$
- Probably want to use the TX-1 on battery



Chiptune Player

- Show off chiptune player again
- Was broken due to systemd (of course)
- Cryptic message requiring pressing ENTER (on a headless system)
- Actually wanted a manual disk check (fsck) which turned out to be overly complicated on a modern system

