Assignment 1 System Administration

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Q1. I use a 4th Generation Intel-i5 1.7Ghz (with Turbo-Boost upto 2.7Ghz) 4200U Processor in my week old Laptop. I had a choice to buy a 3rd Gen i5 Processor as well, with a lesser price, but 4th Gen provides better power consumption(25W) as compared to 35W, thanks to Higher Powered Intel HD 4400 GPU. While, All the benchmarks show 3rd Gen Processor are still better than 4th Gen Processors. Moreover, i5-4200U only supports 16gb of Max RAM and a lesser Graphics Base Frequency of 200 Mhz.

http://cpuboss.com/cpu/Intel-Core-i5-4200U
Specifications - intel.ly/1l0VRCP

Processor Performance and Speed – i7 > i5 > i3
3, 5 and 7 simple denotes the relative processing speed.
i5 and i7 supports TurboBoost Technology whereas i3 doesn't.
i3 has 2C/4T while i5(most) and i7(most) supports 4C/8T.
i3 has 4mb of cache while i5(most) and i7(most) supports 8mb cache.
*Max TDP varies with different models of all the three Processors.

Feature	i3 Processor	i5 Processor	i7 Processor
Support for Turbo Boost Technology	No	Yes	Yes
Relative Price	Cheaper	Medium	Expensive
Cores And Threads	2C/4T	2C/4T or 4C/8T	4C/8T

*Comparison among 4th Gen Processors.

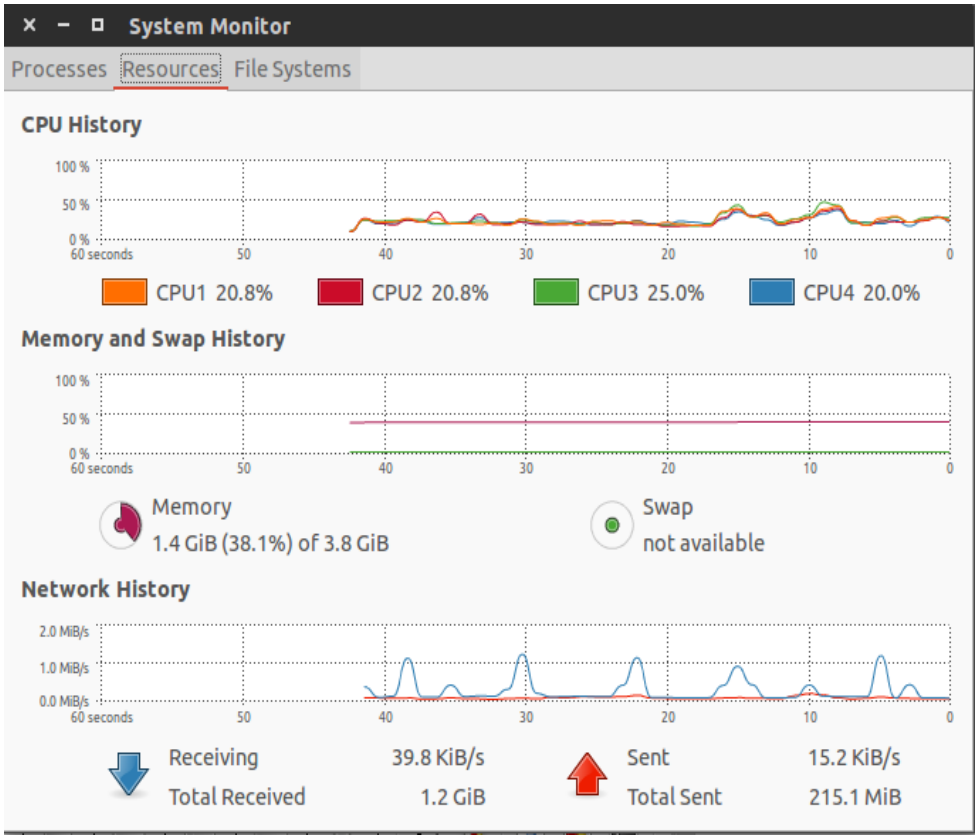
Desktop CPUs

	Frequency	Turbo Boost	Cores	Hyperthreading	Smart Cache	TDW	Graphics
Core i7	2.0-3.5GHz	✔	4	✔	8MB	35-84W	Intel HD 4600
Core i5	3.0-3.4GHz	✔	4	✘	4-6MB	35-84W	Intel HD 4600
Core i3	2.4-3.6GHz	✘	2	✔	3-4MB	35-54W	Varies

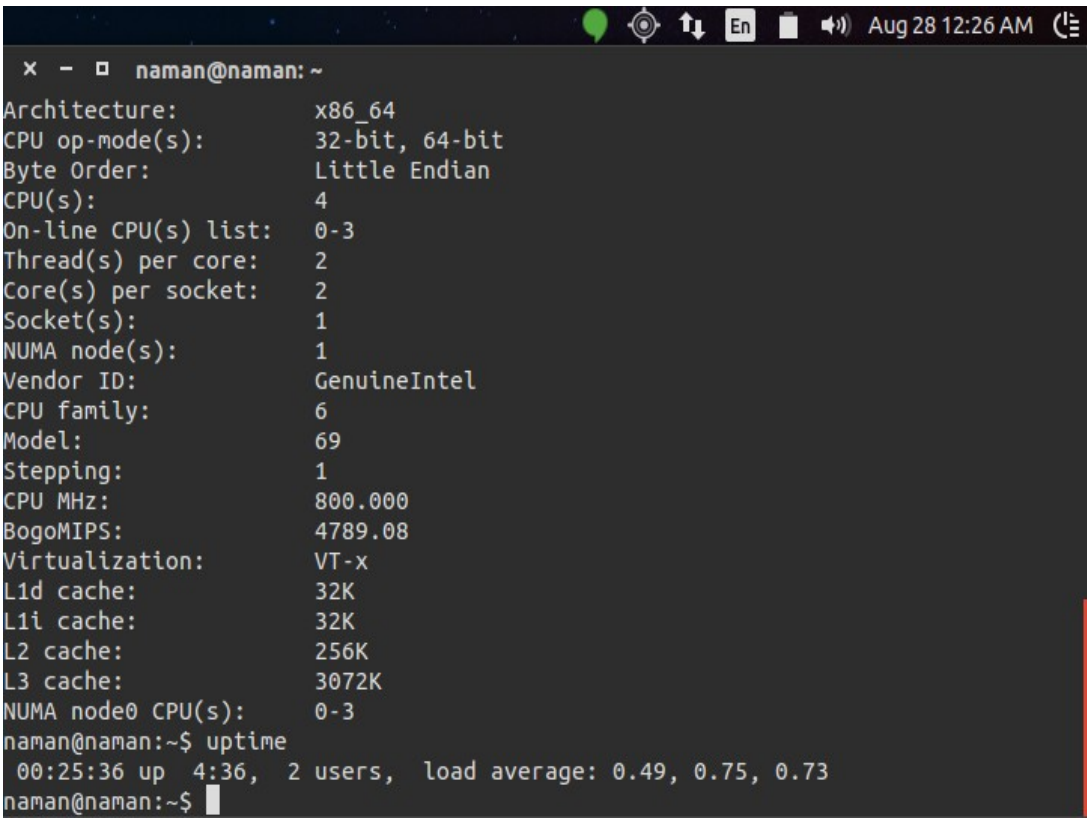
CPU utilisation per Core
Q2. My Phone has Qualcomm Snapdragon™ S4 (MSM8227) Dual-core 1 Ghz., with Adreno 305 GPU.
Tflop Rating Laptop = 0.007890
Tflop Rating Phone = 0.000120
More Details @bit.ly/VQTHAy.

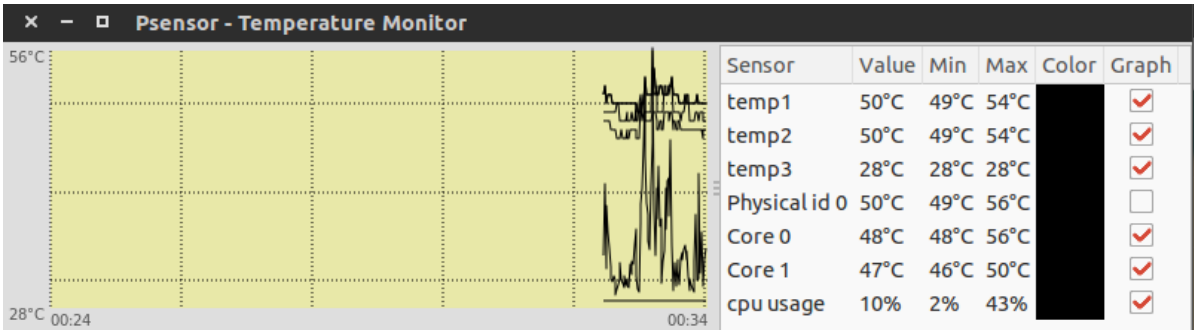
Q3.

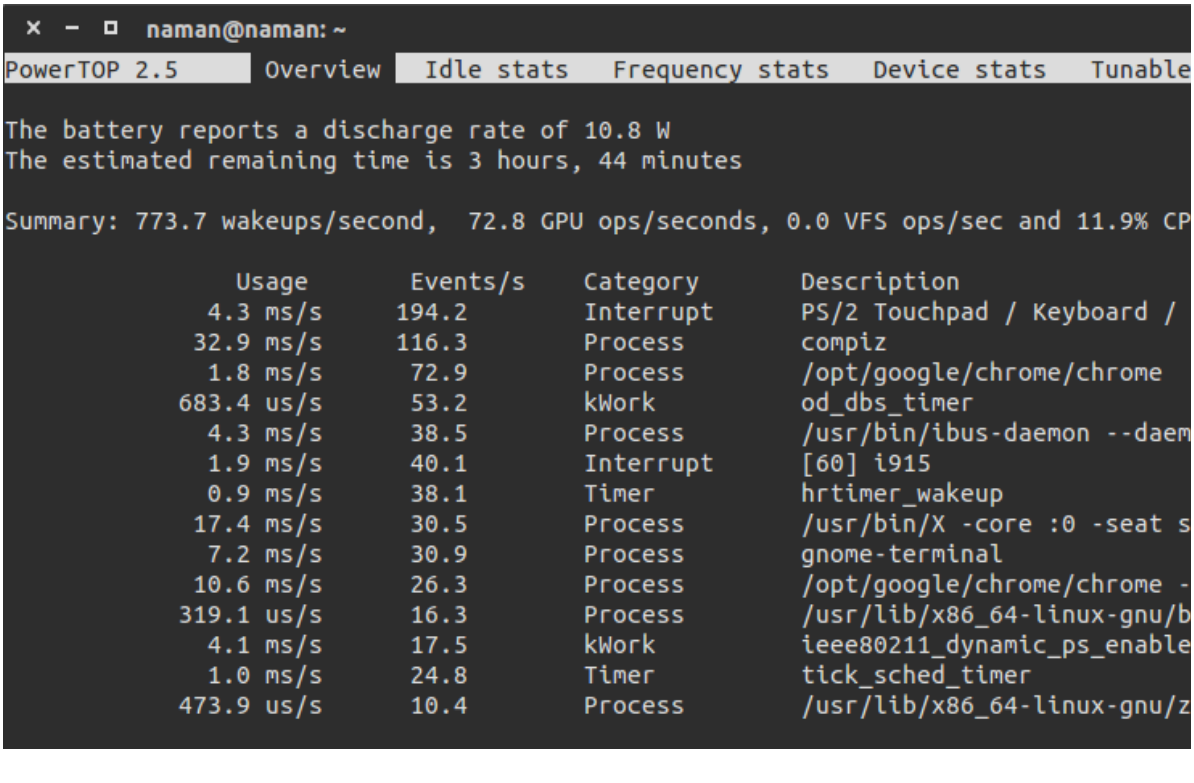
Consumption Details @ http://cpuboss.com/cpu/Intel-Core-i5-4200U




```
coretemp-isa-0000
Adapter: ISA adapter
Physical id 0:  +47.0°C  (high = +100.0°C, crit = +100.0°C)
Core 0:         +46.0°C  (high = +100.0°C, crit = +100.0°C)
Core 1:         +44.0°C  (high = +100.0°C, crit = +100.0°C)
```


Aug 28 12:26 AM
naman@naman: ~
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 4
On-line CPU(s) list: 0-3
Thread(s) per core: 2
Core(s) per socket: 2
Socket(s): 1
NUMA node(s): 1
Vendor ID: GenuineIntel
CPU family: 6
Model: 69
Stepping: 1
CPU MHz: 800.000
BogoMIPS: 4789.08
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 256K
L3 cache: 3072K
NUMA node0 CPU(s): 0-3
naman@naman:~$ uptime
00:25:36 up 4:36, 2 users, load average: 0.49, 0.75, 0.73
naman@naman:~$


Psensor - Temperature Monitor
56°C
28°C
00:24
00:34
Sensor Value Min Max Color Graph
temp1 50°C 49°C 54°C
temp2 50°C 49°C 54°C
temp3 28°C 28°C 28°C
Physical id 0 50°C 49°C 56°C
Core 0 48°C 48°C 56°C
Core 1 47°C 46°C 50°C
cpu usage 10% 2% 43%


naman@naman: ~
PowerTOP 2.5 Overview Idle stats Frequency stats Device stats Tunable
The battery reports a discharge rate of 10.8 W
The estimated remaining time is 3 hours, 44 minutes
Summary: 773.7 wakeups/second, 72.8 GPU ops/seconds, 0.0 VFS ops/sec and 11.9% CP
Usage Events/s Category Description
4.3 ms/s 194.2 Interrupt PS/2 Touchpad / Keyboard /
32.9 ms/s 116.3 Process compiz
1.8 ms/s 72.9 Process /opt/google/chrome/chrome
683.4 us/s 53.2 kWork od_dbs_timer
4.3 ms/s 38.5 Process /usr/bin/ibus-daemon --daem
1.9 ms/s 40.1 Interrupt [60] i915
0.9 ms/s 38.1 Timer hrtimer_wakeup
17.4 ms/s 30.5 Process /usr/bin/X -core :0 -seat s
7.2 ms/s 30.9 Process gnome-terminal
10.6 ms/s 26.3 Process /opt/google/chrome/chrome -
319.1 us/s 16.3 Process /usr/lib/x86_64-linux-gnu/b
4.1 ms/s 17.5 kWork ieee80211_dynamic_ps_enable
1.0 ms/s 24.8 Timer tick_sched_timer
473.9 us/s 10.4 Process /usr/lib/x86_64-linux-gnu/z

Q4. Haswell and IvyBridge has poor Over-Clocking (really difficult) potential.Overall, Ivy Bridge overclocks its frequency slightly more than Haswell. Both have Same Die-Size. While, Haswell us packed with Architectural Improvements.
Haswell Processors are underclocked(like mine) and have a better/lower Power Consumption. Benchmarks indicate only a few percentile points of difference between the last few generations of Intel processor.
The per-core performance of Haswell remains only marginally above that of Ivy Bridge.
Haswell uses the new LGA1150 socket. Haswell has better support for Integrated graphics(eg Iris Pro).
Also , Haswell supports more native Sata3 Ports allowing more SSD's to run at full potential.
In short, due to IPC improvements (Haswell CPUs are slightly faster at the same frequencies than Ivy Bridge by default), overclockers will get slightly better performance out of Haswell compared to Ivy Bridge.

Q5.
Cost of a Server = Rs. 300000
Cost of 1000 Servers = 300000000
Considering Average Power Consumption to be 100W or 0.1 kW.

Total number of hours in an Year = 24*365 = 8760

So, Total 0.1*8760*9(kw-hr) * (1000 servers) = Rs. 7884000

Ratio of Electricity cost wrt Actual Cost of a Server = 7884000/3000000 = 2.628