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ITMD 521
Week 02

Analysis of Part 01:
Below is a brief explanation for the amount of time required to run each dataset with a graph and chart combined with some screen shots.

Virtual Box Used: Ubuntu/trusty64.
Memory allocated: 2048 MB.
CPU Speed: 2699.986 MHz

Observation:
1. Dataset of year 1990 took the least amount of time as compared to the other dataset since the amount of data increased with each dataset.

2. Processing time of the datasets with memory of 1028 and 2048 was same, concluding that the processing time is not affected by the increase or decrease of memory.

3. The processing time increases while processing huge amount of data.

4. For quicker results and to reduce the processing time, the job can be executed on different processors.

5. Memory free before running the job was 86232 KB, and Memory free while running the job was 66252 KB.

The below Chart and graph explains about the time taken to run the awk script on each dataset while parsing the huge amount of data in seconds and giving us the max temperature for each year.

Chart:

Year	Time taken to run the job	Memory Allocated	CPU Speed
1990	13.62	2048 MB	2699.86
1990 &1992	99.28	2048 MB	2699.86
1990 -1993	192.40	2048 MB	2699.86

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Graph:
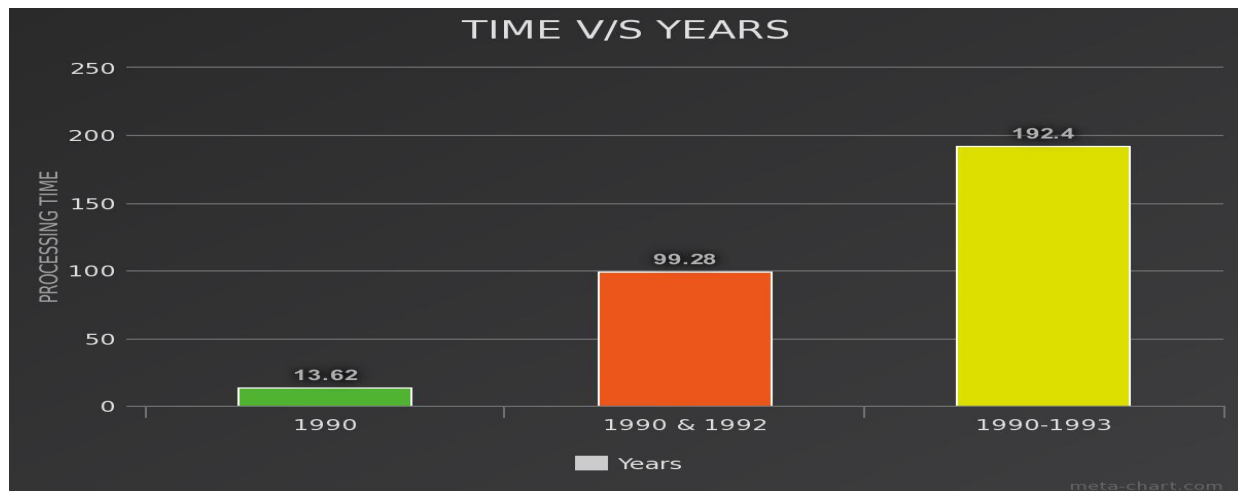
Screen Shots:

Result of the dataset 1990 while running the Awk script:

```
[vagrant@vagrant-ubuntu-trusty-64:~/assignment1$ time -p bash max_temperature.sh
1990    607
real 13.62
user 12.72
sys 0.85
[vagrant@vagrant-ubuntu-trusty-64:~/assignment1$ lscpu | grep "MHz"
CPU MHz:              2699.986
vagrant@vagrant-ubuntu-trusty-64:~/assignment1$
```

Result of the dataset 1990 and 1992 while running the Awk script:

```
[vagrant@vagrant-ubuntu-trusty-64:~/assignment1$ time -p bash max_temperature.sh
1990    607
1992    605
real 99.28
user 91.10
sys 7.93
[vagrant@vagrant-ubuntu-trusty-64:~/assignment1$ lscpu | grep "MHz"
CPU MHz:              2699.986
vagrant@vagrant-ubuntu-trusty-64:~/assignment1$
```

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Result of the dataset 1990-93 while running the Awk script:

```
vagrant@vagrant-ubuntu-trusty-64:~/assignment1$ time  -p bash max_temperature.sh
1990    607
1991    607
1992    605
1993    567
real 192.40
user 176.64
sys 15.24
vagrant@vagrant-ubuntu-trusty-64:~/assignment1$ lscpu | grep "MHz"
CPU MHz:               2699.986
vagrant@vagrant-ubuntu-trusty-64:~/assignment1$
```

Memory Allocated before running the job:

```
vagrant@vagrant-ubuntu-trusty-64:~/assignment1$ cat  /proc/meminfo
MemTotal:        2049964 kB
MemFree:           86232 kB
Buffers:           10408 kB
Cached:          1794800 kB
SwapCached:            0 kB
Active:           914580 kB
Inactive:         971904 kB
Active(anon):      81444 kB
Inactive(anon):      564 kB
Active(file):     833136 kB
Inactive(file):   971340 kB
Unevictable:           0 kB
Mlocked:               0 kB
SwapTotal:             0 kB
SwapFree:              0 kB
Dirty:                 0 kB
Writeback:             0 kB
AnonPages:         81380 kB
Mapped:             7448 kB
Shmem:               672 kB
Slab:              56396 kB
SReclaimable:      48072 kB
SUnreclaim:         8324 kB
KernelStack:         680 kB
PageTables:         2512 kB
NFS_Unstable:          0 kB
Bounce:                0 kB
WritebackTmp:          0 kB
CommitLimit:     1024980 kB
Committed_AS:     139292 kB
VmallocTotal:   34359738367 kB
VmallocUsed:       10116 kB
VmallocChunk:   34359722492 kB
HardwareCorrupted:     0 kB
AnonHugePages:      2048 kB
HugePages_Total:       0
HugePages_Free:        0
HugePages_Rsvd:        0
HugePages_Surp:        0
Hugepagesize:       2048 kB
DirectMap4k:       34752 kB
DirectMap2M:     2062336 kB
vagrant@vagrant-ubuntu-trusty-64:~/assignment1$
```

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Memory Allocated while running the job:

```
vagrant@vagrant-ubuntu-trusty-64:~$ cat /proc/meminfo
MemTotal:        2049964 kB
MemFree:           66252 kB
Buffers:            7432 kB
Cached:          1845968 kB
SwapCached:            0 kB
Active:           126928 kB
Inactive:        1810000 kB
Active(anon):      83664 kB
Inactive(anon):      876 kB
Active(file):      43264 kB
Inactive(file):  1809124 kB
Unevictable:           0 kB
Mlocked:               0 kB
SwapTotal:             0 kB
SwapFree:              0 kB
Dirty:                 0 kB
Writeback:             0 kB
AnonPages:         83600 kB
Mapped:             9268 kB
Shmem:               984 kB
Slab:              25840 kB
SReclaimable:      18060 kB
SUnreclaim:         7780 kB
KernelStack:         728 kB
PageTables:         3104 kB
NFS_Unstable:          0 kB
Bounce:                0 kB
WritebackTmp:          0 kB
CommitLimit:     1024980 kB
Committed_AS:     153400 kB
VmallocTotal:   34359738367 kB
VmallocUsed:       10148 kB
VmallocChunk:   34359723004 kB
HardwareCorrupted:     0 kB
AnonHugePages:         0 kB
HugePages_Total:       0
HugePages_Free:        0
HugePages_Rsvd:        0
HugePages_Surp:        0
Hugepagesize:       2048 kB
DirectMap4k:       34752 kB
DirectMap2M:     2062336 kB
```