COMPARISON OF GPU AND CPU PERFORMANCE

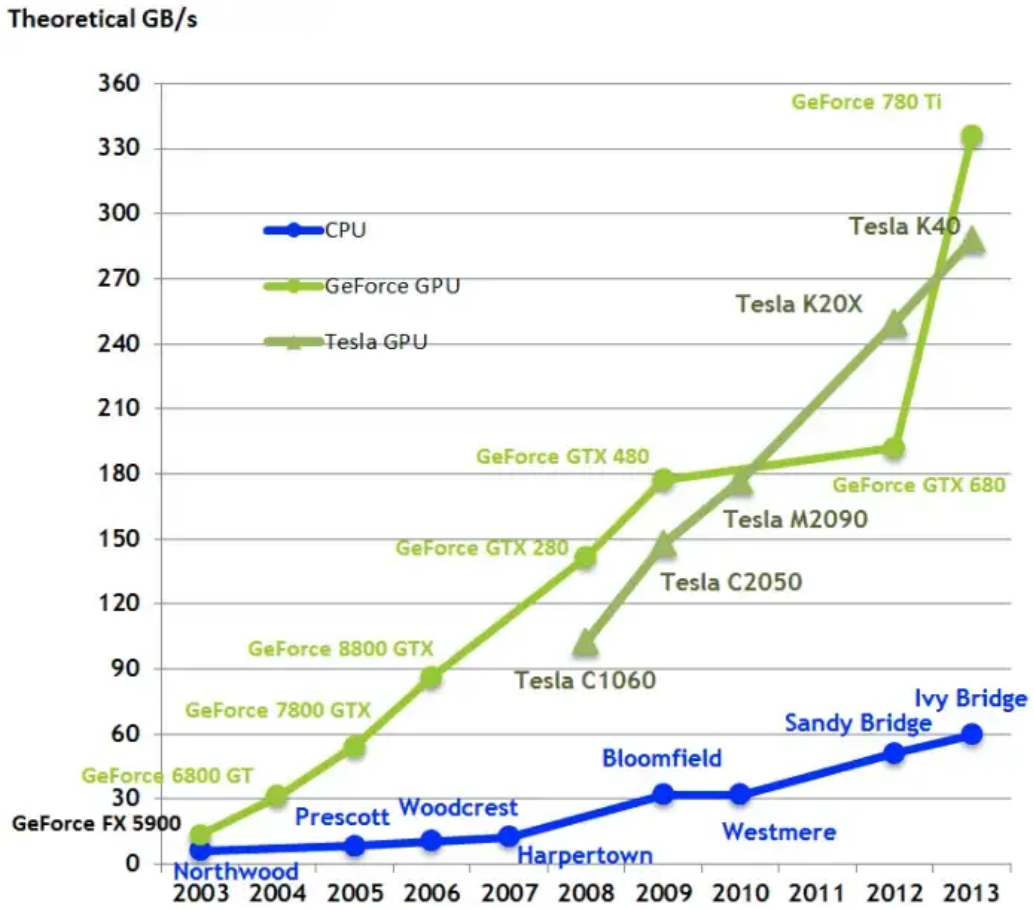
CPU :

The CPU (Central Processing Unit) or the main processor executes computing instructions. Attached to the motherboard via a CPU socket, the CPU listens for input from a computer program or a peripheral such as a keyboard, mouse, or touchpad. It then interprets and processes the input and sends the resulting output to peripherals or stores it in the memory.

GPU :

The GPU (Graphics Processing Unit) is a specialised graphics processor designed to be able to process thousands of operations simultaneously. Demanding 3D applications require parallel texture, mash, and light processing to keep images moving smoothly across the screen, and the CPU architecture is not optimised for those tasks. The original purpose of GPUs was to accelerate graphics rendering.

GPU vs CPU Performance in DNN:



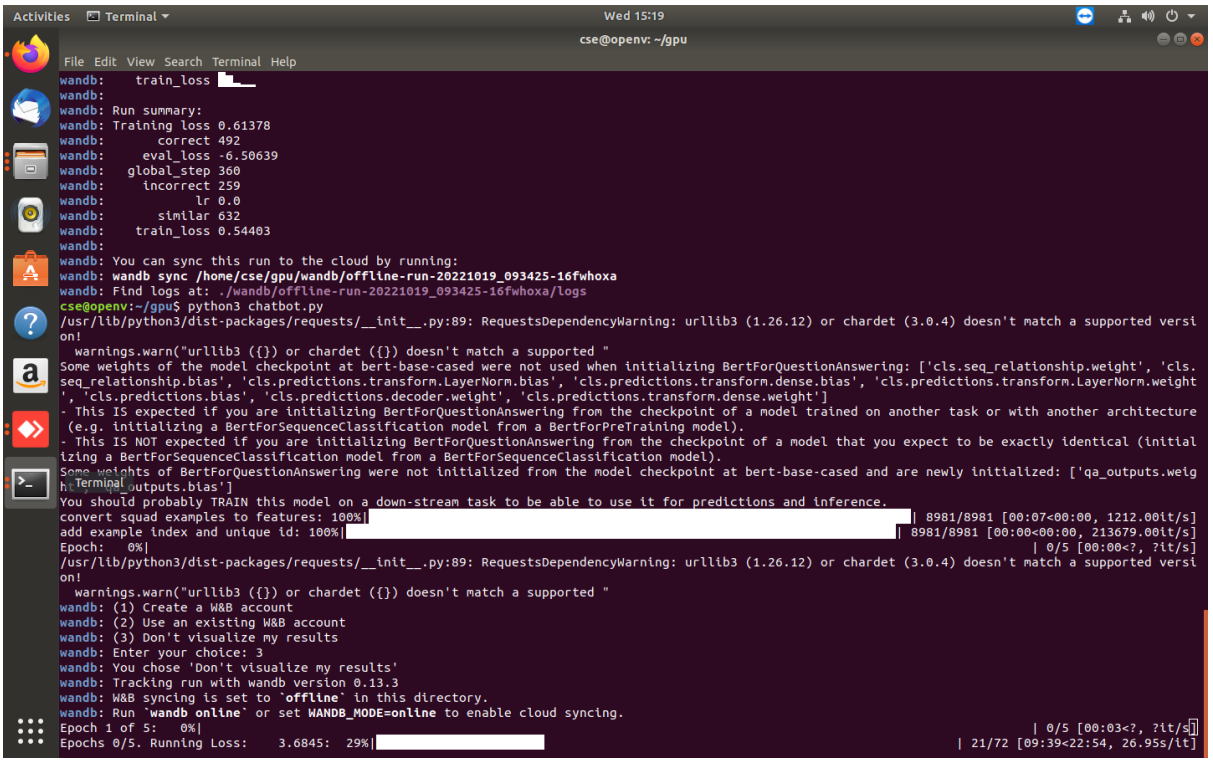
[Medium.com blog on gpu performance in machine learning]

PERFORMANCE STATISTICS:

1.TEXT PROCESSING:

Chatbot application using bert model trained with amazon question answer dataset.

CPU PERFORMANCE:

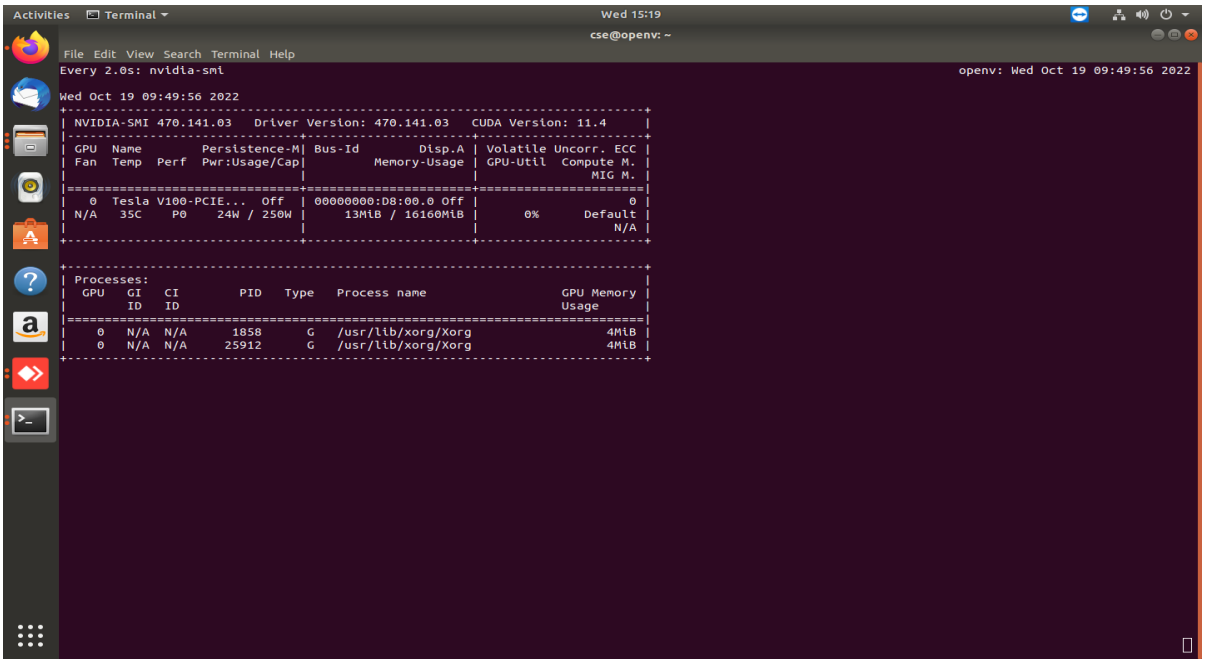


RUNTIME : AROUND 5 HOURS:

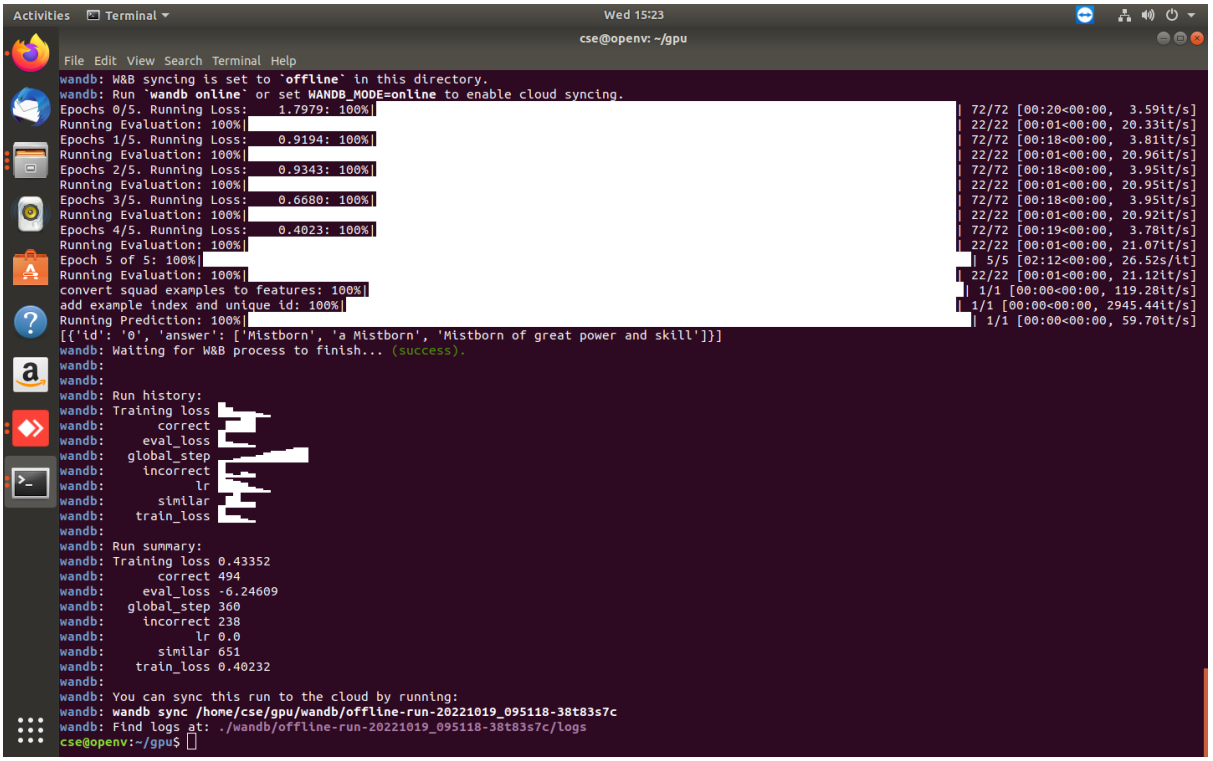
USAGE AND THERMALS:

GPU Memory	13 Mib of 16160 Mib
GPU Power	24 W of 250 W
GPU Temperature	35 C

:



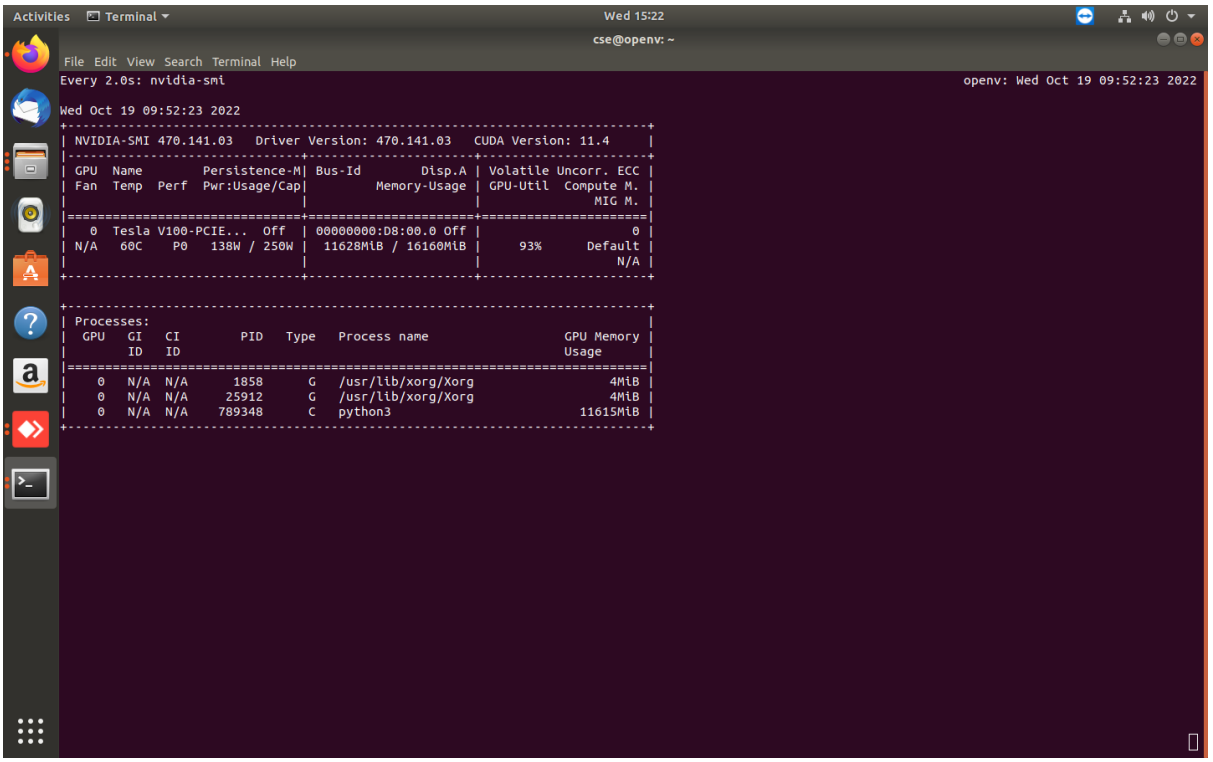
GPU PERFORMANCE :



RUNTIME : 3 mins 21 sec

USAGE AND THERMALS:

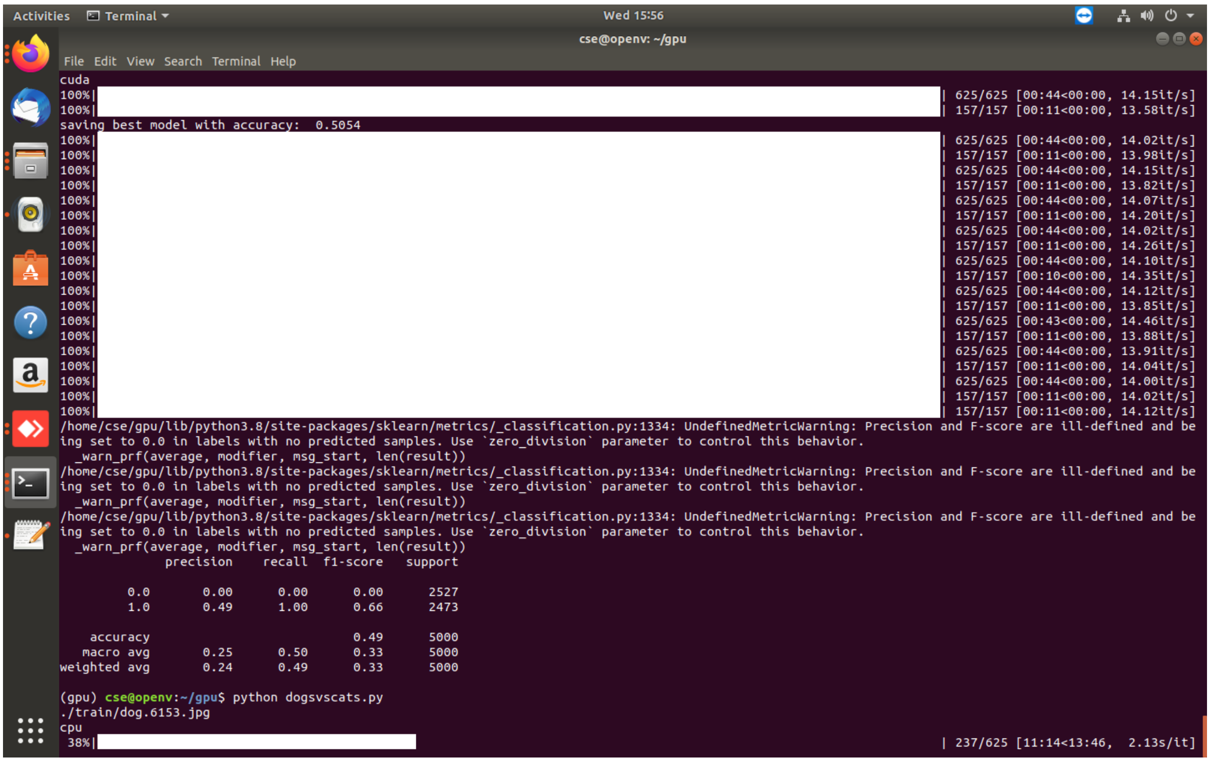
GPU Memory	11628 Mib of 16160 Mib
GPU Power	138 W of 250 W
GPU Temperature	60 C



2. IMAGE PROCESSING:

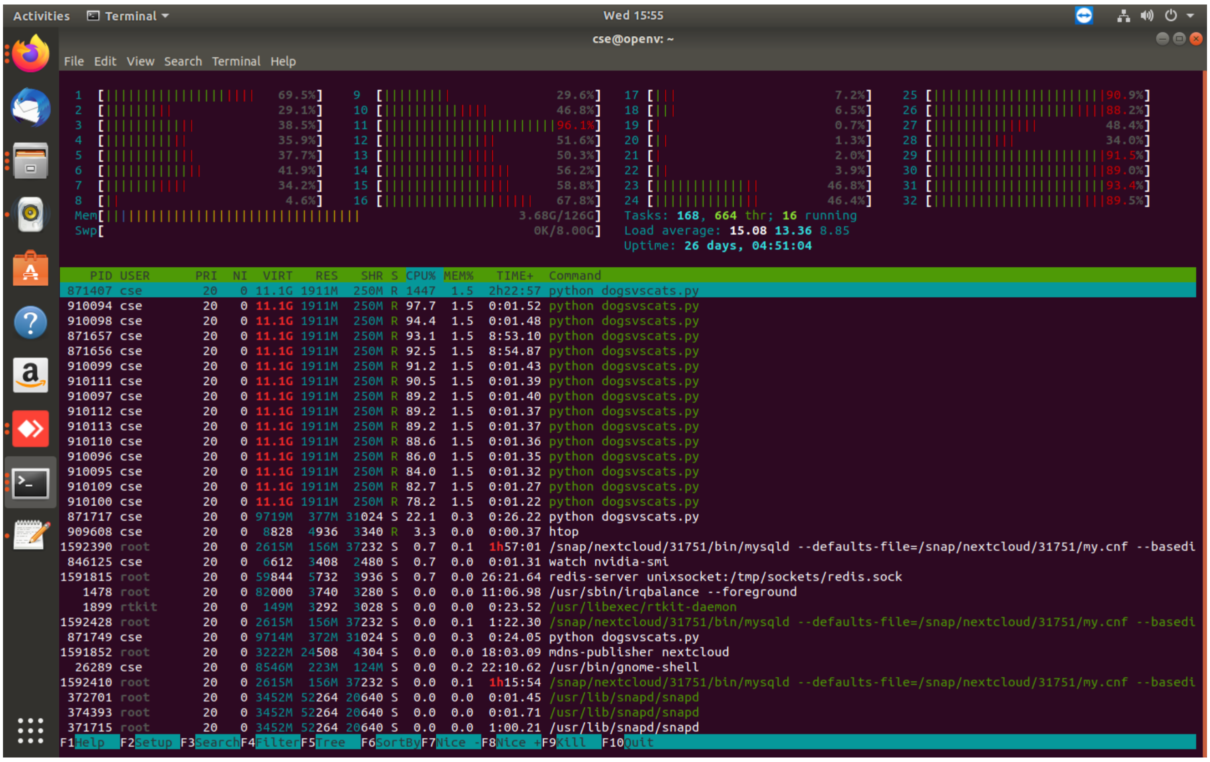
Image classification using deep neural networks in keras framework.The data set using is a classic cats vs dogs dataset.

CPU PERFORMANCE:

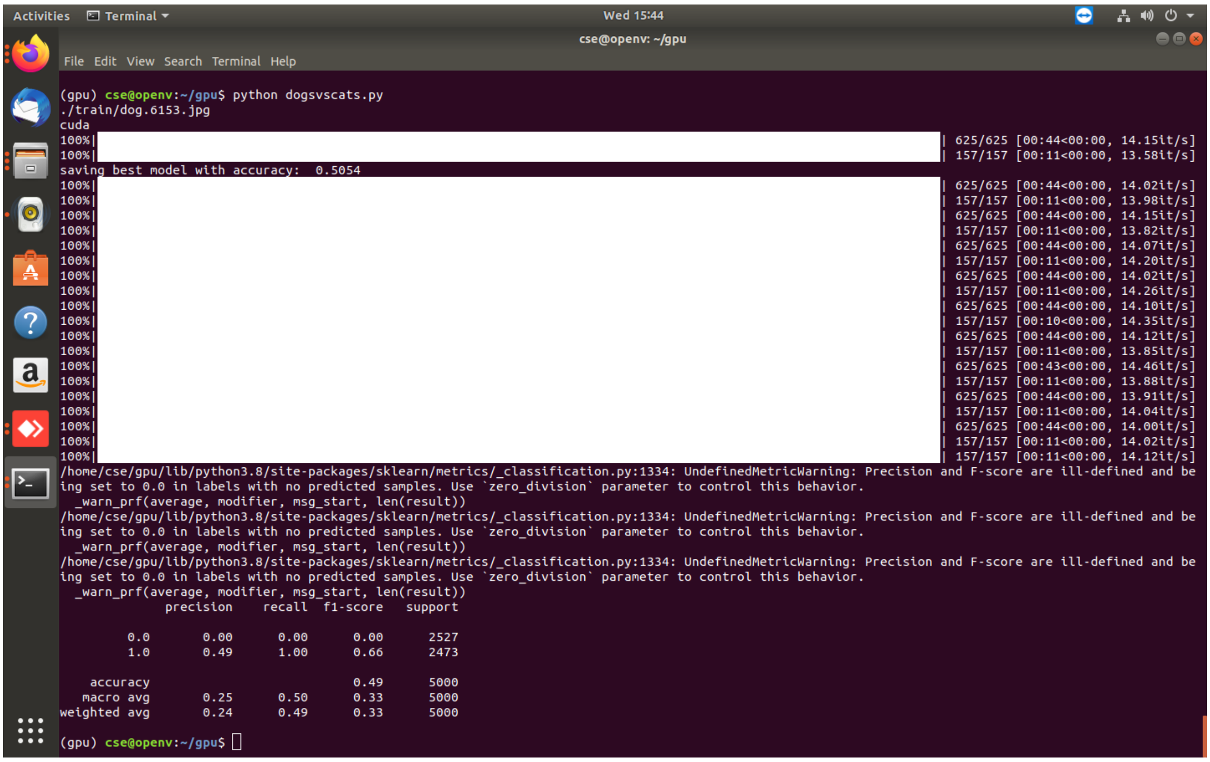


RUNTIME : around 14 mins per epoch

HTOP PERFORMANCE MEASURE:

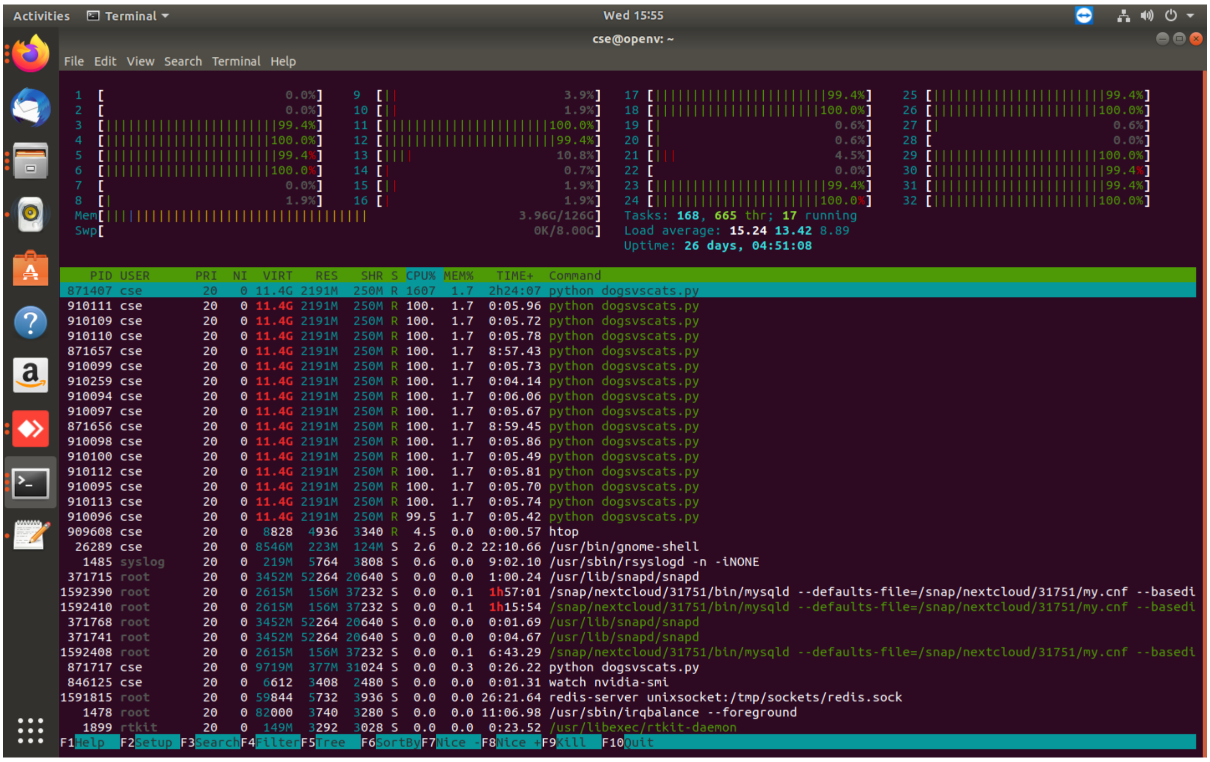


GPU PERFORMANCE :



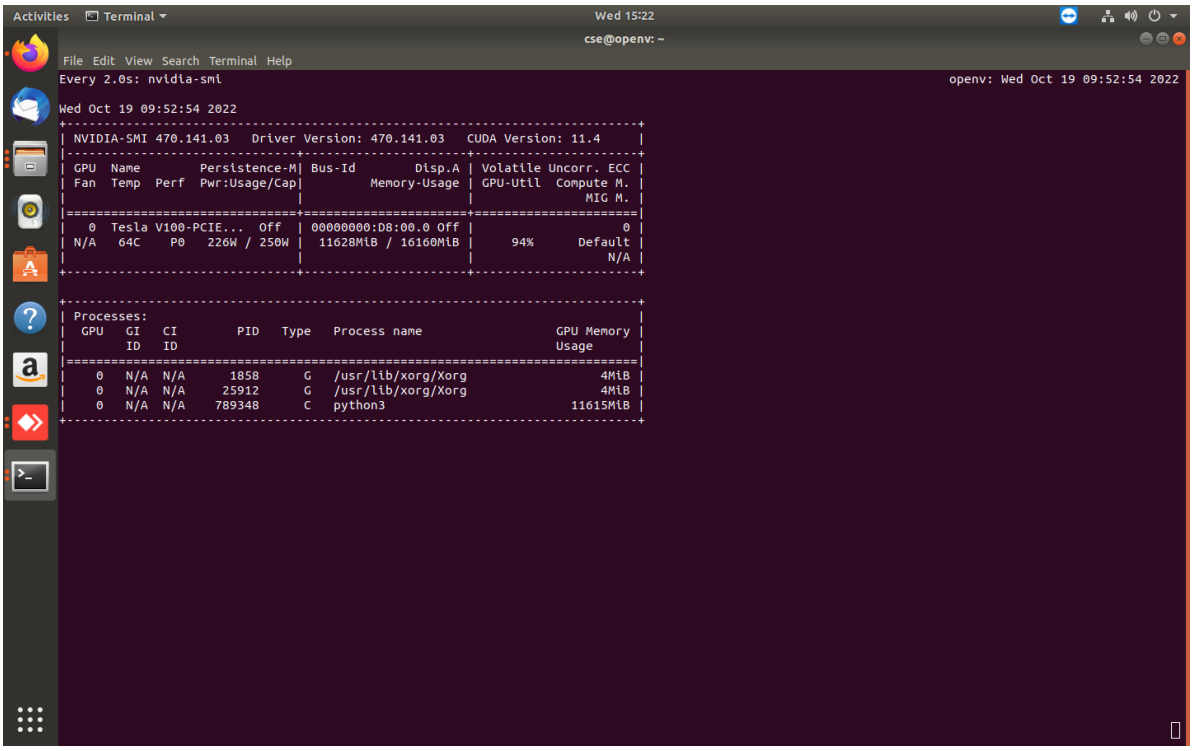
RUNTIME : around 40 secs for a train epoch

HTOP PERFORMANCE MEASURE:



USAGE AND THERMALS:

GPU Memory	11628 Mib of 16160 Mib
GPU Power	226 W of 250 W
GPU Temperature	64 C



CONCLUSION

By comparing the performance of gpu and cpu for various deep learning tasks it is evident that gpu's provide significant performance levels compared to a cpu. The results show that a gpu can complete the training time way before a cpu in both text and image training.