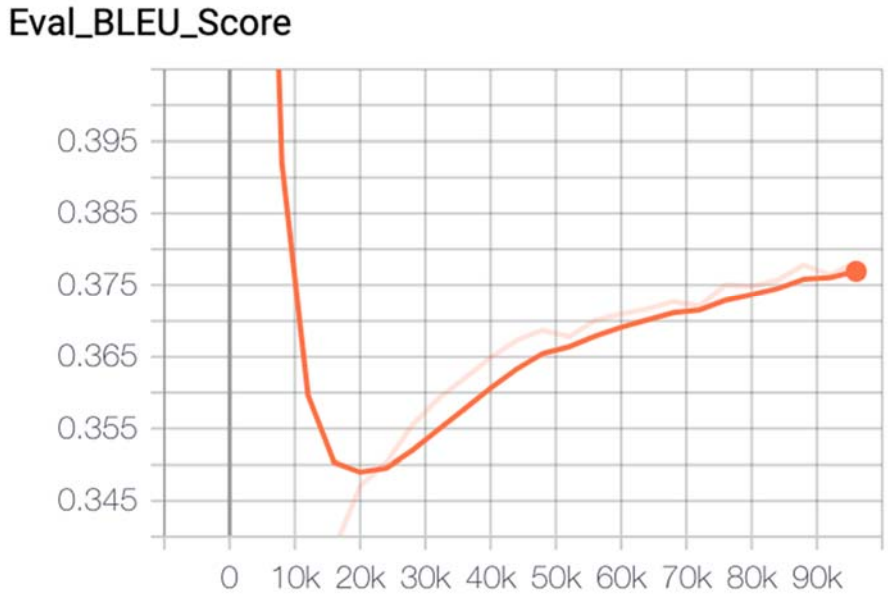
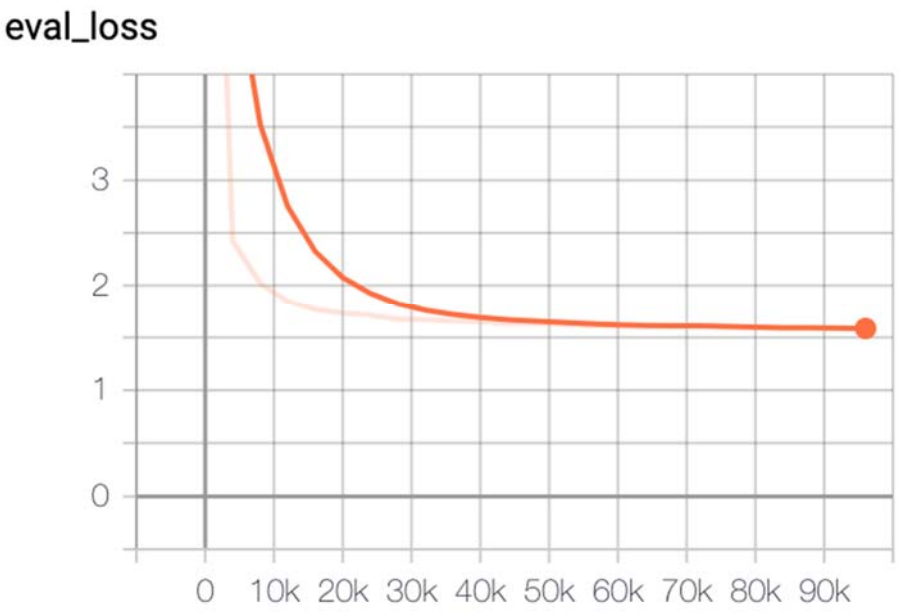
HW 9 Short Response and Screenshots
Sylvia Xiaoshi Yang

- **How long does it take to complete the training run? (hint: this session is on distributed training, so it *will* take a while)**

  It took me 47+ hours for the 100k steps. Should be taking 6+ days in theory to complete the 300k steps.

- **Do you think your model is fully trained? How can you tell?**
  Not yet as both the training and evaluation loss are decreasing.





- **Were you overfitting?**
  No. Eval loss value is around 1.6 and does not go up. Training loss value is still decreasing.

- **Were your GPUs fully utilized?**

```
+-----------------------------------------------------------------------------+
| NVIDIA-SMI 418.67       Driver Version: 418.67       CUDA Version: 10.1     |
|-------------------------------+----------------------+----------------------+
| GPU  Name        Persistence-M| Bus-Id        Disp.A | Volatile Uncorr. ECC |
| Fan  Temp  Perf  Pwr:Usage/Cap|         Memory-Usage | GPU-Util  Compute M. |
|===============================+======================+======================|
|   0  Tesla V100-PCIE...  Off  | 00000000:00:07.0 Off |                    0 |
| N/A   40C    P0   124W / 250W |  15422MiB / 16130MiB |     99%      Default |
+-------------------------------+----------------------+----------------------+
|   1  Tesla V100-PCIE...  Off  | 00000000:00:08.0 Off |                    0 |
| N/A   40C    P0   131W / 250W |  15424MiB / 16130MiB |    100%      Default |
+-------------------------------+----------------------+----------------------+

+-----------------------------------------------------------------------------+
| Processes:                                                       GPU Memory |
|  GPU       PID   Type   Process name                             Usage      |
|=============================================================================|
|    0     71298      C   python                                    15409MiB |
|    1     71299      C   python                                    15409MiB |
+-----------------------------------------------------------------------------+
```

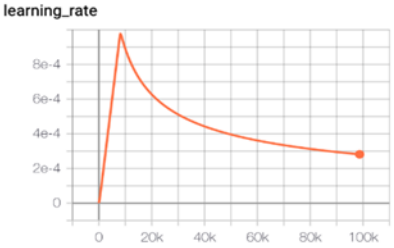
  Yes. It is fully utilized at 100%.

- **Did you monitor network traffic (hint: apt install nmon) ? Was network the bottleneck?**
  No. The outsize is around 100-200 MB, and the connection is 1000 MB, so it is not fully utilized.

Network I/O

I/F Name	Recv=KB/s	Trans=KB/s	packin	packout	insize	outsize	Peak->Recv	Trans
lo	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
eth1	0.7	1.1	7.5	6.0	98.6	186.4	12.4	92.3
docker0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
eth0	88.1	104.2	1181.5	1181.5	76.3	90.3	3801614.5	3675695.8

- **Take a look at the plot of the learning rate and then check the config file. Can you explain this setting?**



Learning rate takes a ramp up up until 8000 steps, then decreases gradually.
As the policy indicates, the learning rate has a “noam” learning rate decreasing scheme.

- **How big was your training set (mb)? How many training lines did it contain?**
  Training set had 798 MB with 5278534 lines.

- **What are the files that a TF checkpoint is comprised of?**
  - A .index file (checkpoint)
  - A .data file (variable values)
  - A .meta file (graphics)

- **How big is your resulting model checkpoint (mb)?**
  The model checkpoint is 829 MB

- **Remember the definition of a "step". How long did an average step take?**
  ~1.7 seconds

- **How does that correlate with the observed network utilization between nodes?**
  I think the network utilization between nodes should not have a significant impact on the GPU.