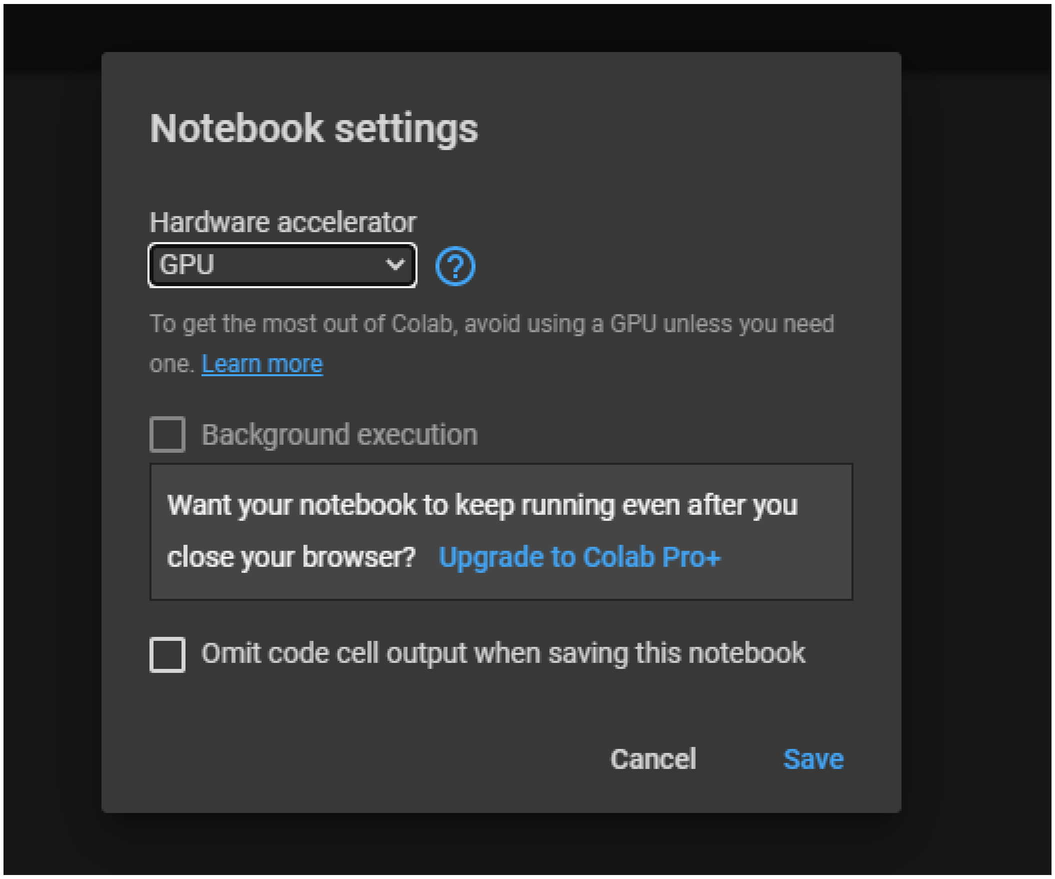
Name :Usman Manzoor

Roll no: P19-0068



Notebook settings

Hardware accelerator

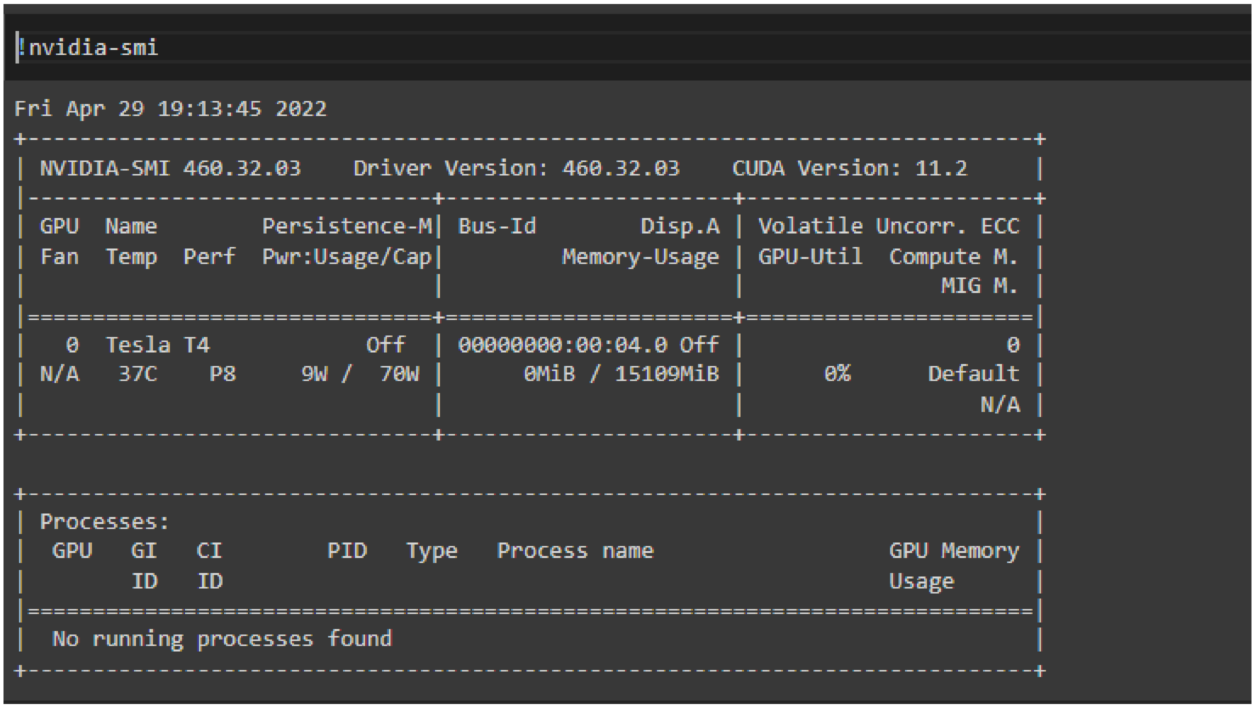
GPU

To get the most out of Colab, avoid using a GPU unless you need one. Learn more

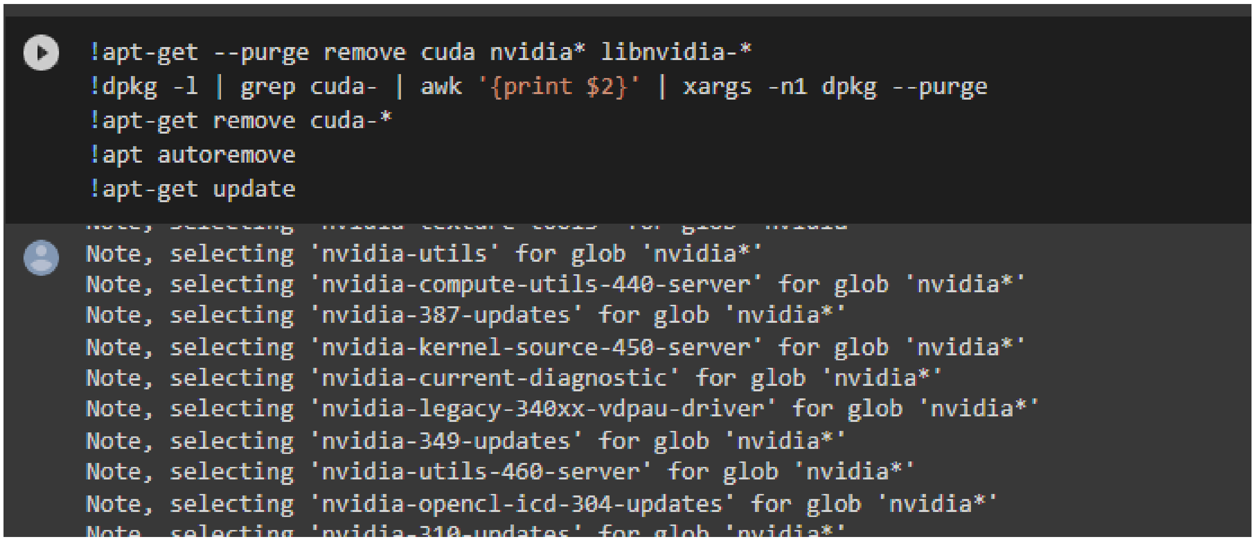
□ Background execution

Want your notebook to keep running even after you close your browser? Upgrade to Colab Pro+

□ Omit code cell output when saving this notebook

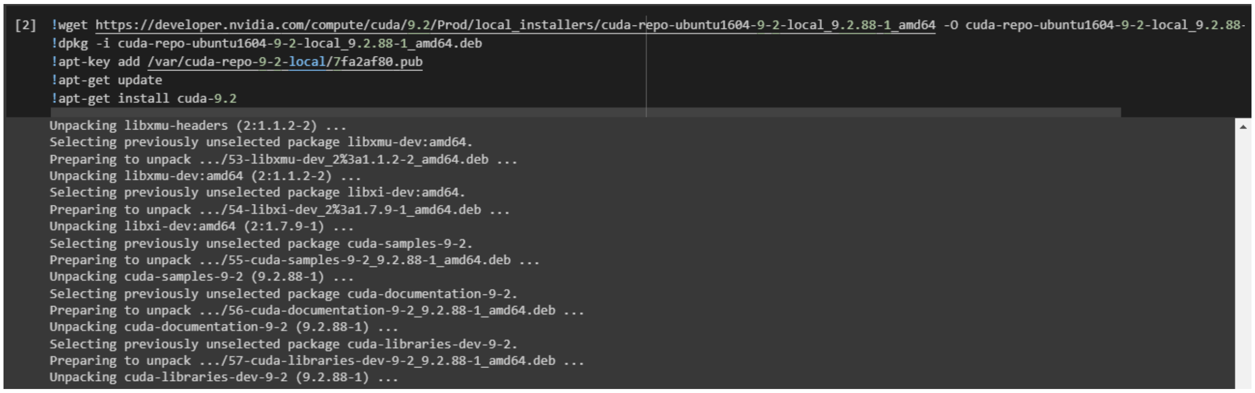


```
!nvidia-smi

Fri Apr 29 19:13:45 2022
+-----------------------------------------------------------------------------+
| NVIDIA-SMI 460.32.03    Driver Version: 460.32.03    CUDA Version: 11.2     |
|-------------------------------+----------------------+----------------------+
| GPU  Name        Persistence-M| Bus-Id        Disp.A | Volatile Uncorr. ECC |
| Fan  Temp  Perf  Pwr:Usage/Cap|         Memory-Usage | GPU-Util  Compute M. |
|                               |                      |               MIG M. |
|===============================+======================+======================|
|   0  Tesla T4            Off  | 00000000:00:04.0 Off |                    0 |
| N/A   37C    P8     9W /  70W |      0MiB / 15109MiB |      0%      Default |
|                               |                      |                  N/A |
+-------------------------------+----------------------+----------------------+

+-----------------------------------------------------------------------------+
| Processes:                                                                  |
|  GPU   GI   CI        PID   Type   Process name                  GPU Memory |
|        ID   ID                                                   Usage      |
|=============================================================================|
|  No running processes found                                                 |
+-----------------------------------------------------------------------------+
```



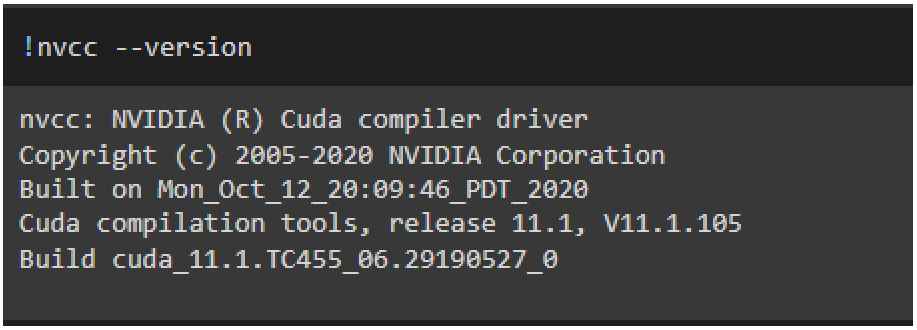
```
!apt-get --purge remove cuda nvidia* libnvidia-*
!dpkg -l | grep cuda- | awk '{print $2}' | xargs -n1 dpkg --purge
!apt-get remove cuda-*
!apt autoremove
!apt-get update
```

```
Note, selecting 'nvidia-texture-tools' for glob 'nvidia*'
Note, selecting 'nvidia-utils' for glob 'nvidia*'
Note, selecting 'nvidia-compute-utils-440-server' for glob 'nvidia*'
Note, selecting 'nvidia-387-updates' for glob 'nvidia*'
Note, selecting 'nvidia-kernel-source-450-server' for glob 'nvidia*'
Note, selecting 'nvidia-current-diagnostic' for glob 'nvidia*'
Note, selecting 'nvidia-legacy-340xx-vdpau-driver' for glob 'nvidia*'
Note, selecting 'nvidia-349-updates' for glob 'nvidia*'
Note, selecting 'nvidia-utils-460-server' for glob 'nvidia*'
Note, selecting 'nvidia-opencl-icd-304-updates' for glob 'nvidia*'
Note, selecting 'nvidia-310-updates' for glob 'nvidia*'
```



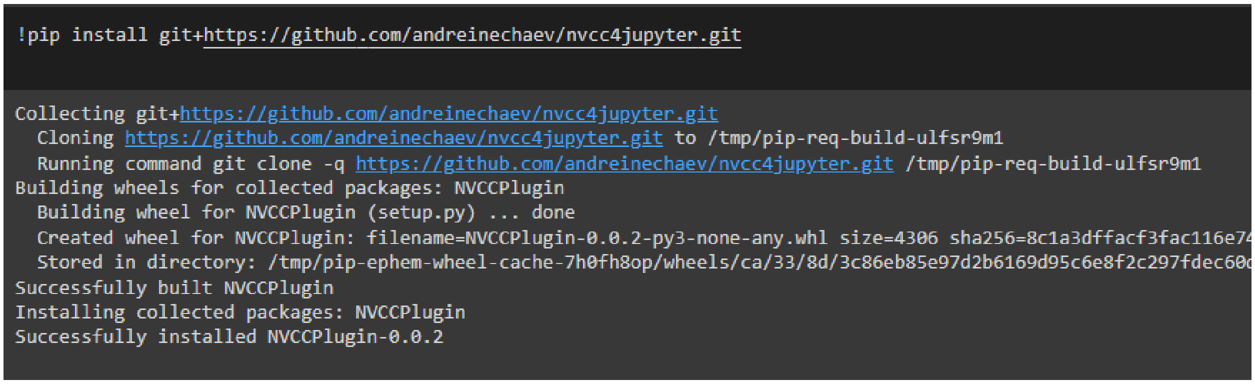
```
[2] !wget https://developer.nvidia.com/compute/cuda/9.2/Prod/local_installers/cuda-repo-ubuntu1604-9-2-local_9.2.88-1_amd64 -O cuda-repo-ubuntu1604-9-2-local_9.2.88-
    !dpkg -i cuda-repo-ubuntu1604-9-2-local_9.2.88-1_amd64.deb
    !apt-key add /var/cuda-repo-9-2-local/7fa2af80.pub
    !apt-get update
    !apt-get install cuda-9.2
```

```
Unpacking libxmu-headers (2:1.1.2-2) ...
Selecting previously unselected package libxmu-dev:amd64.
Preparing to unpack .../53-libxmu-dev_2%3a1.1.2-2_amd64.deb ...
Unpacking libxmu-dev:amd64 (2:1.1.2-2) ...
Selecting previously unselected package libxi-dev:amd64.
Preparing to unpack .../54-libxi-dev_2%3a1.7.9-1_amd64.deb ...
Unpacking libxi-dev:amd64 (2:1.7.9-1) ...
Selecting previously unselected package cuda-samples-9-2.
Preparing to unpack .../55-cuda-samples-9-2_9.2.88-1_amd64.deb ...
Unpacking cuda-samples-9-2 (9.2.88-1) ...
Selecting previously unselected package cuda-documentation-9-2.
Preparing to unpack .../56-cuda-documentation-9-2_9.2.88-1_amd64.deb ...
Unpacking cuda-documentation-9-2 (9.2.88-1) ...
Selecting previously unselected package cuda-libraries-dev-9-2.
Preparing to unpack .../57-cuda-libraries-dev-9-2_9.2.88-1_amd64.deb ...
Unpacking cuda-libraries-dev-9-2 (9.2.88-1) ...
```



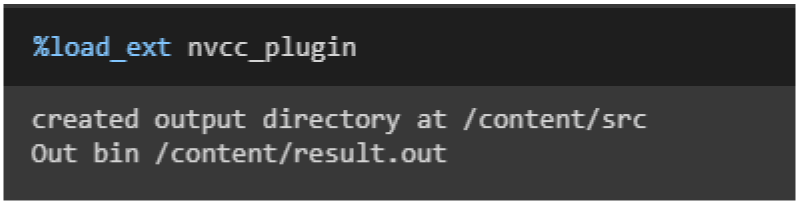
```
!nvcc --version
```

```
nvcc: NVIDIA (R) Cuda compiler driver
Copyright (c) 2005-2020 NVIDIA Corporation
Built on Mon_Oct_12_20:09:46_PDT_2020
Cuda compilation tools, release 11.1, V11.1.105
Build cuda_11.1.TC455_06.29190527_0
```



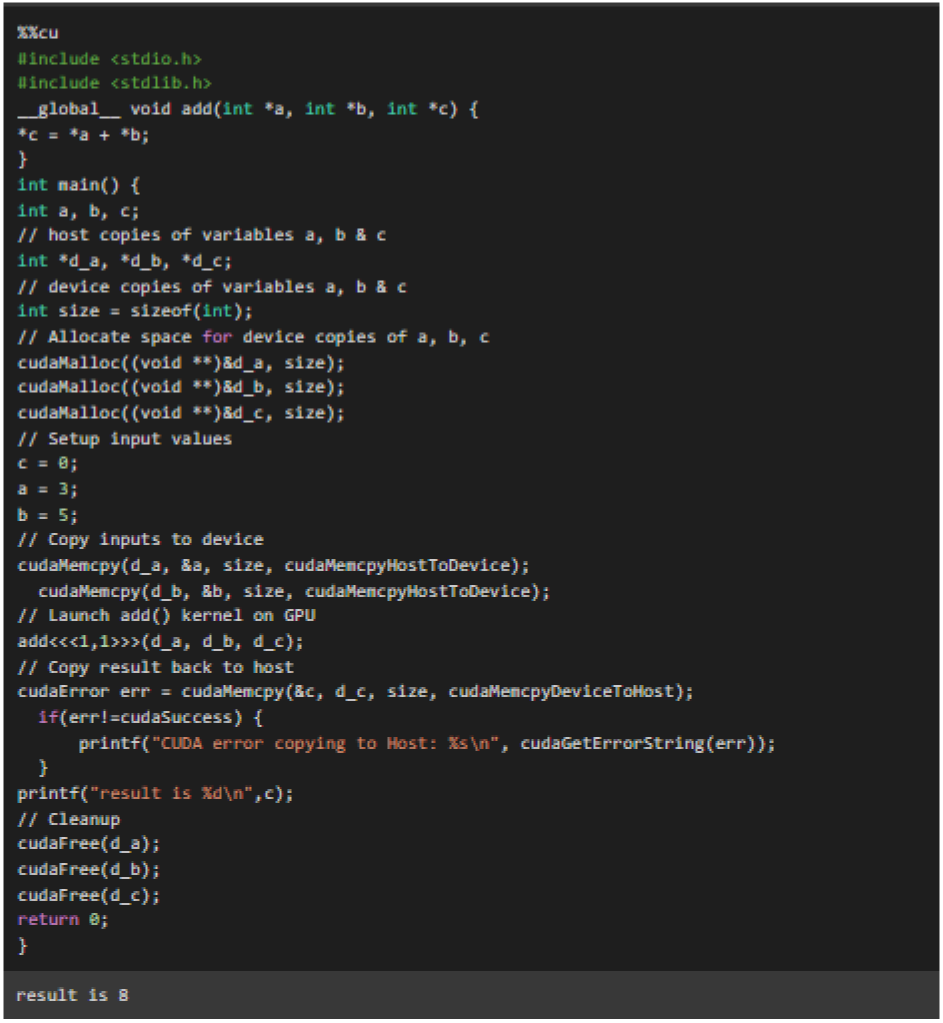
```
!pip install git+https://github.com/andreinechaev/nvcc4jupyter.git
```

```
Collecting git+https://github.com/andreinechaev/nvcc4jupyter.git
  Cloning https://github.com/andreinechaev/nvcc4jupyter.git to /tmp/pip-req-build-ulfsr9m1
  Running command git clone -q https://github.com/andreinechaev/nvcc4jupyter.git /tmp/pip-req-build-ulfsr9m1
Building wheels for collected packages: NVCCPlugin
  Building wheel for NVCCPlugin (setup.py) ... done
  Created wheel for NVCCPlugin: filename=NVCCPlugin-0.0.2-py3-none-any.whl size=4306 sha256=8c1a3dffacf3fac116e74
  Stored in directory: /tmp/pip-ephem-wheel-cache-7h0fh8op/wheels/ca/33/8d/3c86eb85e97d2b6169d95c6e8f2c297fdec60
Successfully built NVCCPlugin
Installing collected packages: NVCCPlugin
Successfully installed NVCCPlugin-0.0.2
```



```
%load_ext nvcc_plugin
```

```
created output directory at /content/src
Out bin /content/result.out
```



```
%%cu
#include <stdio.h>
#include <stdlib.h>
__global__ void add(int *a, int *b, int *c) {
*c = *a + *b;
}
int main() {
int a, b, c;
// host copies of variables a, b & c
int *d_a, *d_b, *d_c;
// device copies of variables a, b & c
int size = sizeof(int);
// Allocate space for device copies of a, b, c
cudaMalloc((void **)&d_a, size);
cudaMalloc((void **)&d_b, size);
cudaMalloc((void **)&d_c, size);
// Setup input values
c = 0;
a = 3;
b = 5;
// Copy inputs to device
cudaMemcpy(d_a, &a, size, cudaMemcpyHostToDevice);
  cudaMemcpy(d_b, &b, size, cudaMemcpyHostToDevice);
// Launch add() kernel on GPU
add<<<1,1>>>(d_a, d_b, d_c);
// Copy result back to host
cudaError err = cudaMemcpy(&c, d_c, size, cudaMemcpyDeviceToHost);
  if(err!=cudaSuccess) {
      printf("CUDA error copying to Host: %s\n", cudaGetErrorString(err));
  }
printf("result is %d\n",c);
// Cleanup
cudaFree(d_a);
cudaFree(d_b);
cudaFree(d_c);
return 0;
}
```

```
result is 8
```