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Guide: Performance Optimization on AWS

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Abstract

This is a guideline document to show the necessary actions to set up and `use gcc` to evaluate its performance optimization support on Ubuntu (16.04).

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1. Spin up EC2 instance

1. Using Lab 1 as a reference, please spin up a **t2.2xlarge** EC2 instance running Ubuntu 18.04, with your CS205-key
2. Connect to this instance w/ `ssh` (or putty on Windows), again using your CS205-key.

2. Install gcc

3. Install `gcc` via the toolchain PPA

```
$ sudo apt-get install software-properties-common
$ sudo add-apt-repository ppa:ubuntu-toolchain-r/test
$ sudo apt-get update
$ sudo apt-get install gcc
```

4. To check the `gcc` installation is successful run following command in the terminal

```
$ gcc -v
```

3. Evaluate Performance Flags

This section includes a simple optimization session aimed at verifying the `correct installation of the gcc compiler`.

- Upload to the VM the `seq_mm.c` code and compile with `several optimization flags` (you also need `timing.c` and `timing.h`). This simple code performs a 1,500 by 1,500 matrix multiplication. See that by default the matrices are created in the `stack of the process (8MB)`, you should use `ulimit -s 64000` to increase the stack to < 64MB, which is the hard limit for the stack size.

```
$ gcc -DUSE_CLOCK seq_mm.c timing.c -o seq_mm -lm
$ gcc -O3 -DUSE_CLOCK seq_mm.c timing.c -o seq_mm_O3 -lm
$ time ./seq_mm > output
```

```
real  0m28.533s
user  0m28.380s
sys   0m0.052s
```

```
$ time ./seq_mm_O3 > output
```

```
real  0m3.964s
user  0m3.836s
sys   0m0.032s
```

Stop your instances when are done for the day to avoid incurring charges



Terminate them when you are sure you are done with your instance