CSE 332: Data Structures and Parallelism

Google Compute Engine & Eclipse

This handout will help you set up Google Compute Engine and Eclipse for the Chess project.

(1) Setting up Eclipse/Terminal

This project, you will use Google Compute Engine to access more computing power than normal. As such, you will need to ssh to a remote instance. Google Compute Engine lets you do this by clicking a button in the browser, but you may ssh however you like.

(2) Setting up Google Compute Engine

Additionally, you will need to create a project and VM Instances using Google Compute Engine.

You should begin by going to:

```
https://console.developers.google.com/start
```

Then, create a project by clicking on the top left:



You should use cse332-p3-<your team name> as the project name.

New Project		
Project name 📀		
cse332-p3-teamname		
Your project ID will be cse332-p3-teamname ₍₂₎ Edit		
Show advanced options		
	CANCEL	ODEATE
	CANCEL	CREATE

Next, you will need to get a "coupon code". Google has provided us with one coupon code per student. This should be more than enough credits to complete the project, but if you end up needing more, send an e-mail to Adam (blank@cs.washington.edu).

To get a coupon code, follow these steps:

- (1) Go to http://goo.gl/gcpedu/h5C5oR and fill in your name and e-mail address.
- (2) You should get a confirmation e-mail with a link. Click on the link.
- (3) You should get another e-mail with a link and a coupon code. Either click on the link in the e-mail, or go to https://console.cloud.google.com/education and fill in the coupon code.
- (4) Chose "yes" or "no, and then click "Accept and Continue" on the webpage that comes up.

(3) Enabling Billing

Now that you have a "billing account" filled with your coupon code, you need to apply it to your GCE project.

- (1) Go to https://console.cloud.google.com/compute
- (2) Click the "enable billing" button:

≡	Google Cloud Platform	cse332-p3-teamname 👻	۹					
۲	Compute Engine	VM instances						
A	VM instances	You can use Compute Engine after you	ı enable billir	ng				
晶	Instance groups	Pay only for what you use. Learn more about Compute Engine pricing.						
	Instance templates	Enable billing						
0	Disks							
0	Snapshots			Ormanda Fasilar				
[10] [11]	Images			Compute Engine				
≣≣	Metadata			Compute Engine lets you create and run virtual machines on				
Ô	Health checks			Google Infrastructure. Compute Engine offers scale, performance, and value that allows you to easily launch large compute clusters on Google's infrastructure				
:::	Zones							
\odot	Operations							
	Quotas							
\$	Settings							

(3) Choose "Chess Bots" in the pop-up dialog, and click "Set Account".

Your project should be set up to use the GCE coupon; you might need to wait a little bit for compute engine to get ready.

(4) Creating An Instance

Now you should be ready to go with GCE. To test this out, let's try spinning up an instance.

Go to https://console.cloud.google.com/compute, and click on the "create instance" button.

When creating an instance, you will have a choice of several options. You *can* choose anything you like, but we recommend the following choices. In particular, if you are creating a "test instance", we recommend you use f1-micro.

Suggested GCE Instance Choices

- Zone: us-central1-b
- Machine Type:
 - For a test instance: f1-micro
 - For a real instance: n1-highcpu-32
- Image: Debian GNU/Linux 7.8

If you insist on using a Windows Image, you're on your own.

	Select a machine type			
Create a new instance	Machine types determine the specifications of your machines, such as the amount of memory, virtual cores, and persistent disk limits an instance will have. Learn more about machine types			
Name 😮	Shared-core machines			
test-instance	f1-micro			
Zone 🔊	1 vCPU, 0.6 GB Memory			
us-central1-b	g1-small 1 vCPU, 1.7 GB Memory			
Machine type 🔞	Standard machines			
f1-micro	n1-standard-1 1 vCPU, 3.75 GB Memory			
vCPU Memory	n1-standard-2			
1 0.6 GB Change	2 vCPU, J.S GB Memory n1-standard-4 4 vCPU J.5 GB Memory			
Boot disk 📀	n1-standard-8			
New 10 GB standard persistent disk	8 vCPU, 30 GB Memory			
Image	n1-standard-16 16 vCPU, 60 GB Memory			
Debian GNU/Linux 7.8 (wheezy)	n1-standard-32 32 vCPU, 120 GB Memory			
Firewall 🔞	High CPU machines			
Add tags and firewall rules to allow specific network traffic	🔿 n1-highcpu-2			
	2 vCPU, 1.8 GB Memory			
	n1-highcpu-4 4 vCPU, 3.6 GB Memory			
$\stackrel{\scriptstyle imes}{}$ Management, disk, networking, access & security options	n1-highcpu-8			
	8 vCPU, 7.2 GB Memory			
You will be billed for this instance. Learn more	n1-highcpu-16 16 vCPU, 14.4 GB Memory			
	n1-highcpu-32			
Create Cancel	32 vCPU, 28.8 GB Memory			
Equivalent REST or command line	High memory mechines			
	Select Cancel			

Once your instance boots, you will be able to ssh into it by clicking the "ssh" button next to it in the list:

Name ^	Zone	Disk	Network	In use by	External IP	Connect
🔤 🔮 chessbots	us-central1-f	chessbots	default		104.197.134.107	SSH
🥑 umessage	us-central1-f	umessage	default		104.197.67.89	SSH

(5) Connecting To An Instance

Now that you've created your instance, you are ready to ssh to it. To do this, click the button in the GCE interface labeled "ssh" in the row of the instance you just created.

You're now connected to your instance!

Once you connect to your instance, you should copy/paste the following command into the terminal:

source <(curl -s https://courses.cs.washington.edu/courses/cse332/gce/setup-instance.sh)
Make sure you read the instructions that the script prints out. You will need to copy another key to gitlab,</pre>

and, when you do, if it errors, make sure your key does not have any spaces in it.

(6) Running A Bot On A GCE Instance

When you are running one of your bots on a GCE instance, you **should not** use EasyChess, because you do not want to access it with a GUI. Instead, you will use CloudClient.java.

In preparation for running your bot on the server, edit the configuration of CloudClient.java to be set to your Chess Server Login and the bot you want to run. Then, after you've run the command (above), you should run CloudClient on the VM. Finally, to see your bot play the game, you should do the following:

- Run EasyChess on your local machine
- Type "games" to see the list of currently running games
- Type "watch #"

(7) GCE Won't Allow Me To Use More Cores!

If you have multiple instances running, the *total* you are allowed is 32 cores. Sometimes, for reasons that I haven't figured out, GCE doesn't let you use 32 cores like it should.

If this happens, follow these instructions and it should start working in a matter of minutes:

• Go to this form:

https://docs.google.com/forms/d/1vb2MkAr9JcHrp6myQ3oTxCyBv2c7Iyc5wqIKqE3K4IE/viewform

- Fill out the required fields at the top, and then the one labeled "Total requested number of cores" in the "US-CENTRAL1 regional quotas" part of the form.
- Then, check back periodically at:

https://console.cloud.google.com/compute/quotas?project=YOUR_PROJECT to see if the 24 goes up to 32.