HU Extension **Assignment 01** E-90 Cloud Computing

Course website: https://canvas.harvard.edu/courses/4077
Handed out: 09/04/2015 Due by 11:59 PM on Friday, 09/11/2015

Use this word document for capturing all screen images and describing all your steps after each problem. Include your html files and txt files in your submission for problem 2. Points are deducted for missing steps. For each day late beyond the deadline, 10 points are deducted/day late.

This problem set relies on using Amazon's Web Service.
Register for the EC2 Service on the Amazon Web Service site: **aws.amazon.com/free.** If you have never registered before, please sign up for the Free Tier. Be careful to capture all security credentials. Please **do not** submit security credentials with your solution.
When working with AWS Management Console we find Chrome better. Google rules! However, you can use MS Internet Explorer or Mozilla Firefox if that is your choice
Once you log into Amazon's Free Web Tier, check your zone that Amazon has defaulted for your account. To do this, there is a pull down for your zone location in the upper right corner on Amazon console screen. Note your zone is where your services and storage will reside and where you can find particular AMIs per zone. You can move around in zones. You can change your default zone here.

Describe **all steps** for each problem set and capture screen shots for each step with a JPG image. Don't forget to put your name on the top of this file for your submitted homework.
Go to www.awseducate.com, and Harvard is a member institution. As the department select Others. Enroll yourself into AWS Academic program. That will give you some $100 of credit for AWS services. Once your free tier expires, you can start using that additional credit.

Problem 1:

Capture all steps via screen captures when using AWS for the following problem. Fetch a BitNami AMI with Tomcat Stack. That is basically a LAMP machine image.LAMP stands for Linux, Apache, MySQL, PHP. BitNami adds a Tomcat server installation as well for viewing http pages. Such instances are typically used for Web site development. You should use a **micro instance.** In the North Virginia region, you should use the AMI: ami-008db468. If you are in another region, and could not locate that particular AMI, please look for a similar BitNami RedHat Tomcat stack AMI. Do not use AMI-s from AWS MarketPlace. They cost more. You are welcome to use another type of AMI if you feel comfortable with that AMI. If you recall, we used a micro instance because it is free of charge. Make sure that the security group you are creating allows traffic on port 22 (for ssh and scp). You must add port 80 for HTTP (Web Server default port) and port 443 for https from the security group. Show all your security groups. Check whether you can see anything on port 80 using the Public DNS address in your web browser. Capture the image of the Web page – it should show a healthy web server message. If you get an error message, recheck your steps. You will not get full credit for an error message.
Total points: 30

Problem 2:
Download Cygwin if you are not on a Linux or Apple box. Make sure you transfer the OpenSSH package. A Cygwin power point briefing developed by the Teaching Assistant provides all steps on downloading Cygwin. OR If you know what you are doing, you can work with Putty and WinSCP or any other secure shell and secure copy utilities.
Create a very simple or very complex web page (if you like complexity) and transfer that page to the directory:

```
/opt/bitnami/apache2/htdocs
```

on your new AMI. If you decide to use another type of Linux box, your directory will be different.
To copy your web page files into your instance, you must have write permission on directory: /mnt in your instance and you must be user sudo. This command is run within your instance.

$ sudo chmod 777 /mnt

In order to copy a file from your desktop or laptop to the remote instance you need to use `scp` (secure copy command) from your shell (Cygwin, putty, etc) . The syntax of that command is like this:

```
$scp –i ec2hu.pem new_page.html
   bitnami@ec2-54-242-17-195.compute-1.amazonaws.com:/mnt
```

Notes:

1. `ec2hu.pem` is the name of one of my key pair files. Your pem file will have a different name.

2. `new_page.html` is the name of my HTML page. Your html file will have a different name.
3. Colon, `":"` after `.com` is significant.
4. `/mnt` is the name of the directory to which you most probably have a write privilege. If it happens that you do not, then, login into the system, and grant all privileges to everyone on `/mnt` by issuing a command like: `$ sudo chmod 777 /mnt`
5. You will have to use `"sudo"` in front of practically all of your commands: vi (for editing), `mv` (move), `cp` (copy), `cd` (change directory) , etc. Apparently, user `bitnami` does not own much on your machine and you have to impersonate the super user. That is what `sudo` command allows you to do.
6. When copying files using sudo cp make sure the owner and group permissions are properly set.
7. If you deal with HTML every day, please add a link to the existing `index.html` file that will let a user navigate to your new page. If you do not deal with HTML a lot, rename the existing `index.html` to `index.html.bak` and name your HTML file `index.html`. Next time you visit 'Your Public DNS' address you will see your page.

Convince yourself and us that you can see your HTML page displayed on the server. Show all commands.
Total points: 30

Problem 3:
Keep track of how many hours your instance is up and for how long any of your active volumes is up. Find on the Amazon AWS site a place where Amazon reports your usage. Show the relative and absolute time ranges. Find out what was the cost of doing this problem set. Capture all images for this problem and describe.
Total points: 30

Problem 4:
STOP and TERMINATE YOUR INSTANCE once you do not need it any more. Capture your images and describe.
Total points: 10

Upload your homework file as a word document or PDF file named: E90_YourLastNameYourFirstNameHW01.doc/.docx/.pdf and all your files (html, jpg) for problem 2 to the course web site in your folder for assignment 1.

If you have issues with the upload, please notify us by email in the course email box. If you are raising issues that might be of interest to all of your colleagues in the class or need clarification of homework, please use the Discussion Board on the course site. The Discussion Board is your best friend.

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