Section 1:
Getting started with AWS & GitLab

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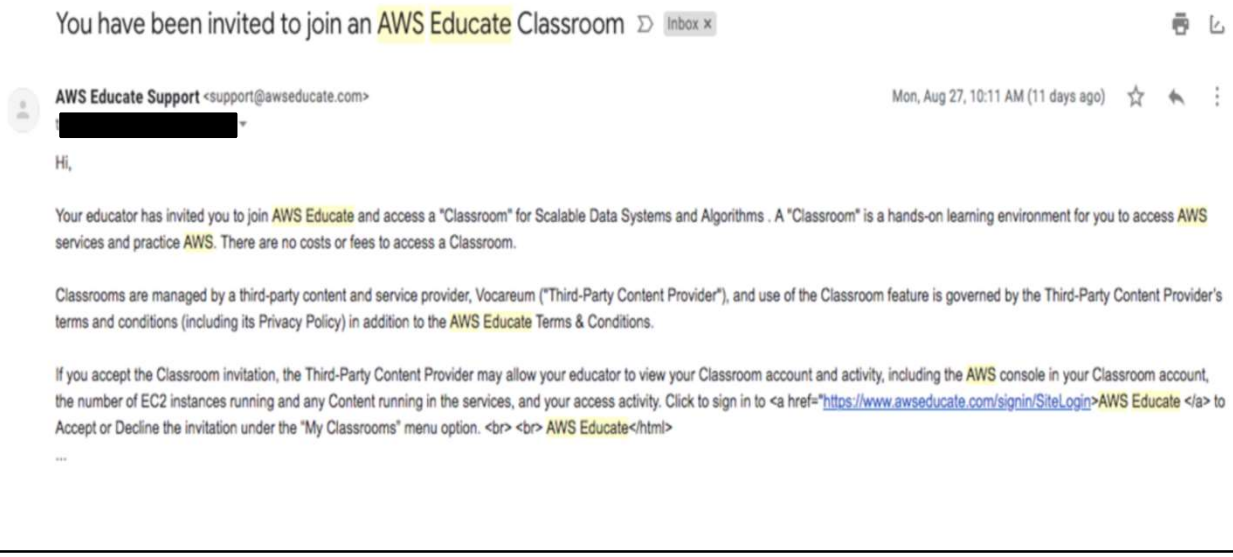
AWS Educate



You have been invited to join an AWS Educate Classroom Inbox ×

AWS Educate Support <support@awseducate.com>
[redacted]
Mon, Aug 27, 10:11 AM (11 days ago)

Hi,

Your educator has invited you to join AWS Educate and access a "Classroom" for Scalable Data Systems and Algorithms . A "Classroom" is a hands-on learning environment for you to access AWS services and practice AWS. There are no costs or fees to access a Classroom.

Classrooms are managed by a third-party content and service provider, Vocareum ("Third-Party Content Provider"), and use of the Classroom feature is governed by the Third-Party Content Provider's terms and conditions (including its Privacy Policy) in addition to the AWS Educate Terms & Conditions.

If you accept the Classroom invitation, the Third-Party Content Provider may allow your educator to view your Classroom account and activity, including the AWS console in your Classroom account, the number of EC2 instances running and any Content running in the services, and your access activity. Click to sign in to AWS Educate to Accept or Decline the invitation under the "My Classrooms" menu option.

 AWS Educate</html>

...

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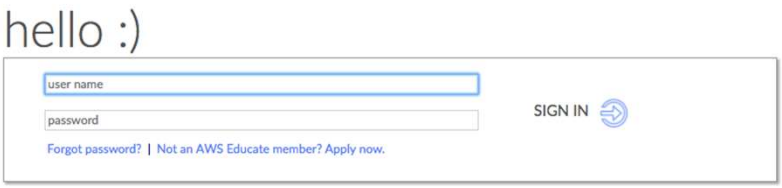
Step 1: Create a AWS Educate account use the same email address to which the invite was sent!

aws educate



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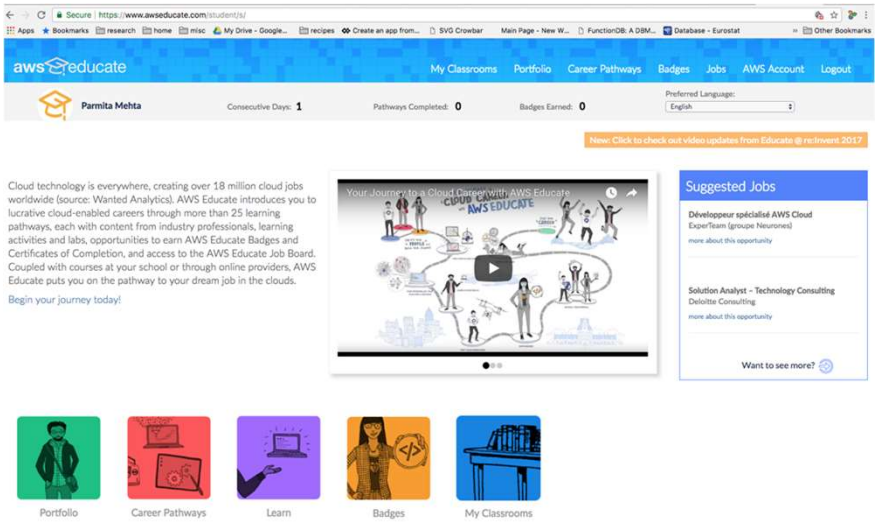
Step 2: Sign-in



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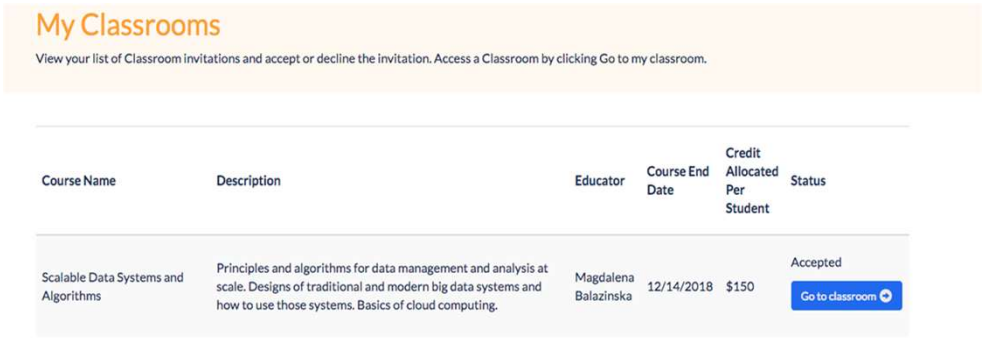
Step 3: Go to classroom



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AWS Usage

AWS Educate based classroom does not support Amazon Redshift so it cannot be used for HW1, which depends on Amazon Redshift.

For HW1 and Section 2 sign-up for a regular(non AWS educate) AWS account. If you have not deployed a Redshift cluster since July 1st, 2014 you are eligible for Amazon Redshift free trial program.

To learn more go to: https://aws.amazon.com/redshift/free-trial/

IMPORTANT: If you do not wish to use a separate account for HW1 or no longer qualify for Redshift's free trial, you can complete HW1 using AWS RDS, which is available though the AWS Educate Classroom. The choice will not affect your grade, it will only give you a different experience.

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Getting started with AWS

AWS Overview

- Services
- Regions
- Pricing and Billing
- Accessing AWS

Billing Alerts

- Enable billing alerts

- AWS UI
  - Creating a key-pair
  - Creating security groups
  - Launching an instance
  - Storing and retrieving data from S3
- AWS SDK (Python)
  - Accessing S3 – retrieve object
  - Listing contents
  - Create bucket
  - Upload object

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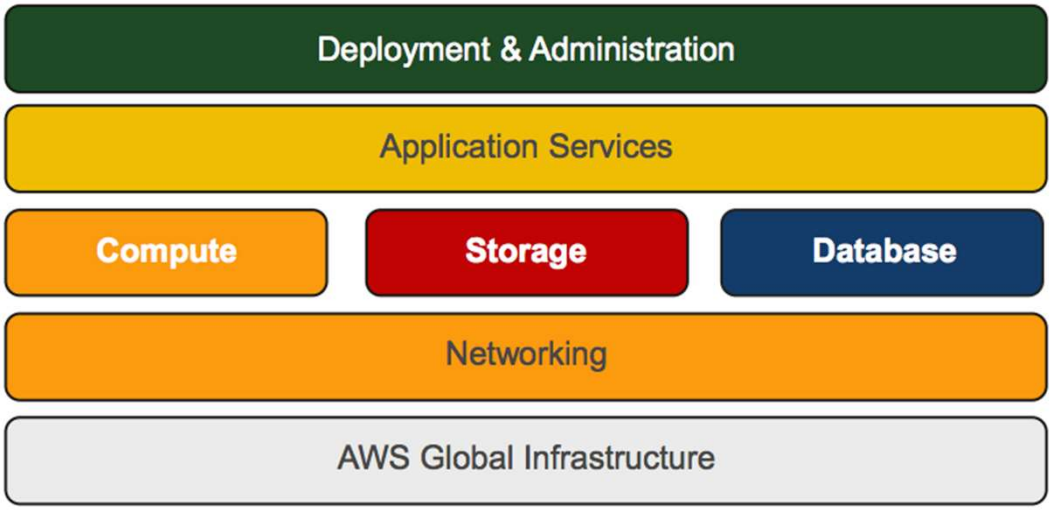
What is Available from AWS



amazon web services

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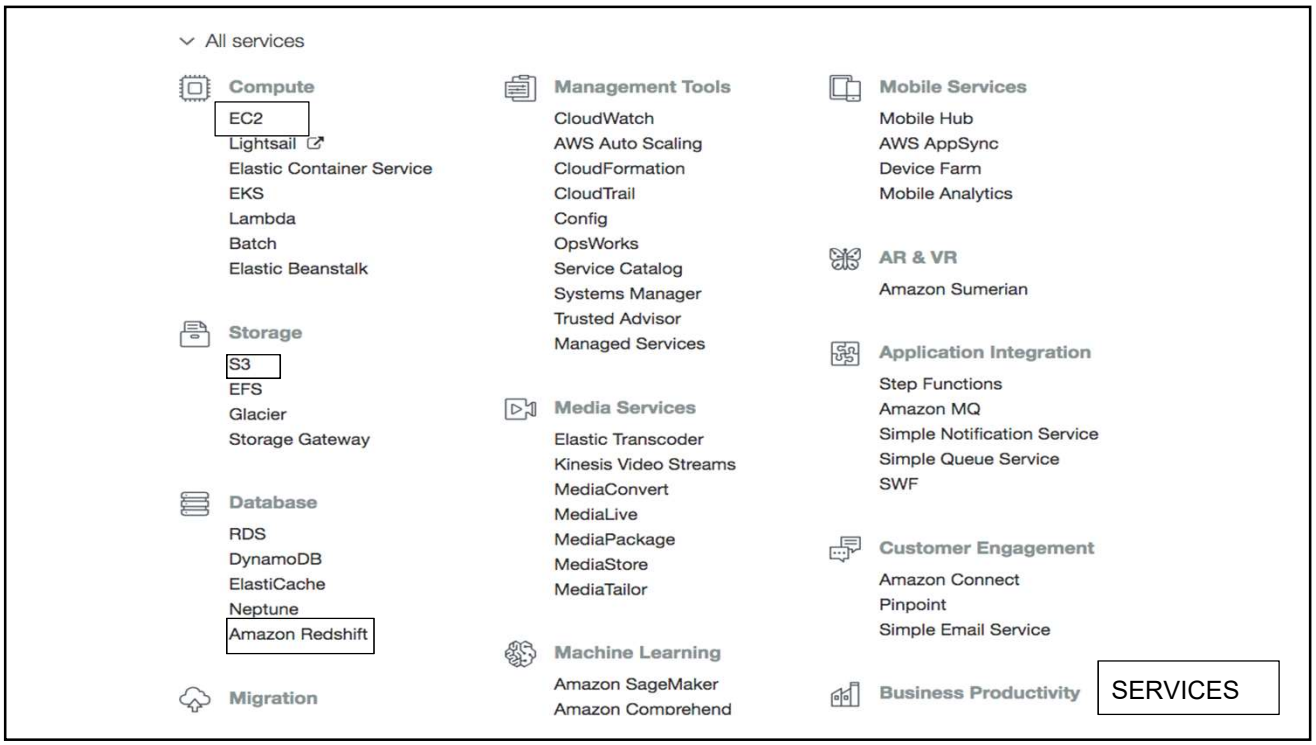
All services
Compute
EC2
Lightsail
Elastic Container Service
EKS
Lambda
Batch
Elastic Beanstalk
Storage
S3
EFS
Glacier
Storage Gateway
Database
RDS
DynamoDB
ElastiCache
Neptune
Amazon Redshift
Migration
Management Tools
CloudWatch
AWS Auto Scaling
CloudFormation
CloudTrail
Config
OpsWorks
Service Catalog
Systems Manager
Trusted Advisor
Managed Services
Media Services
Elastic Transcoder
Kinesis Video Streams
MediaConvert
MediaLive
MediaPackage
MediaStore
MediaTailor
Machine Learning
Amazon SageMaker
Amazon Comprehend
Mobile Services
Mobile Hub
AWS AppSync
Device Farm
Mobile Analytics
AR & VR
Amazon Sumerian
Application Integration
Step Functions
Amazon MQ
Simple Notification Service
Simple Queue Service
SWF
Customer Engagement
Amazon Connect
Pinpoint
Simple Email Service
Business Productivity
SERVICES

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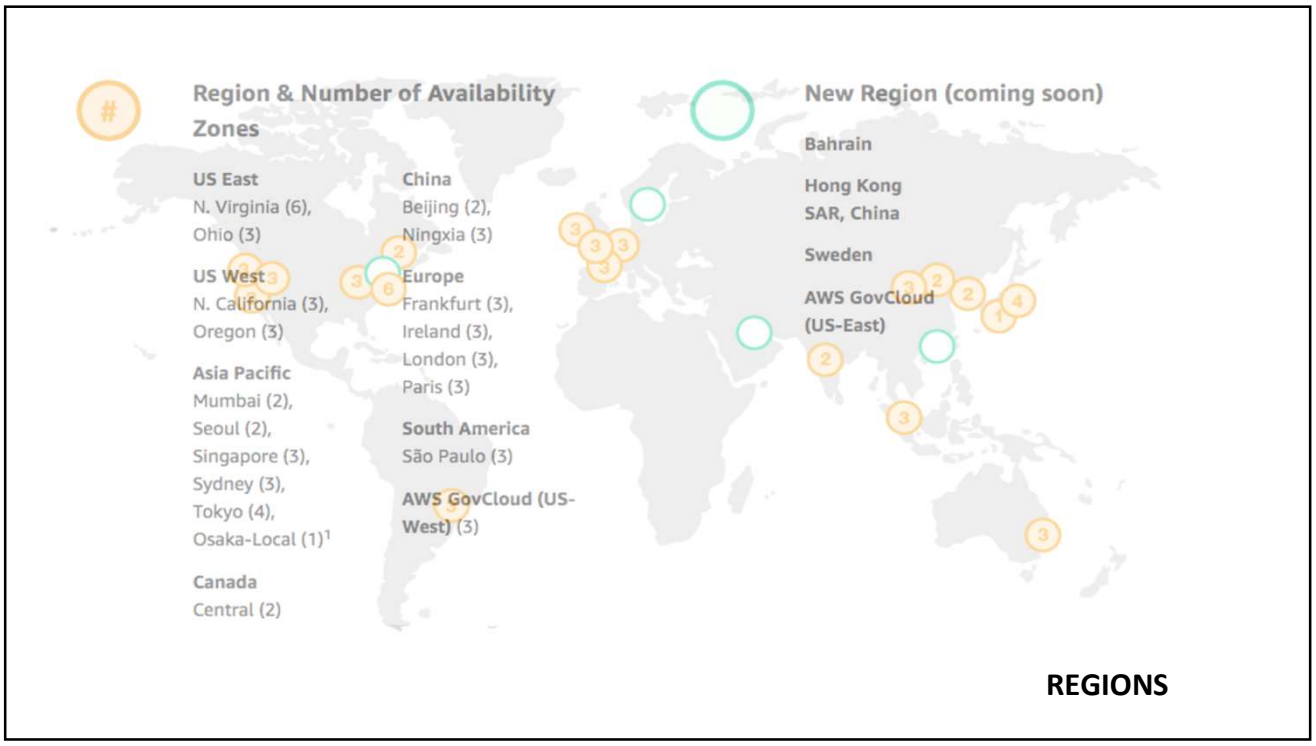
Region & Number of Availability Zones
US East
N. Virginia (6),
Ohio (3)
US West
N. California (3),
Oregon (3)
Asia Pacific
Mumbai (2),
Seoul (2),
Singapore (3),
Sydney (3),
Tokyo (4),
Osaka-Local (1)[1]
Canada
Central (2)
China
Beijing (2),
Ningxia (3)
Europe
Frankfurt (3),
Ireland (3),
London (3),
Paris (3)
South America
São Paulo (3)
AWS GovCloud (US-West) (3)
New Region (coming soon)
Bahrain
Hong Kong SAR, China
Sweden
AWS GovCloud (US-East)
REGIONS

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Pricing and Billing

- Pay as you go pricing for all services.
- Tiered pricing, higher usage means lower rates per unit.
- Reserved pricing (EC2 and RDS) significantly discounted rates (up to 60% less).
- EC2 Spot Instances are another way to save money.
- Free Tier: If you create your AWS account in the last 12 months you are eligible for AWS free tier. http://aws.amazon.com/free/
- AWS Educate: http://aws.amazon.com/education/awseducate/
- Billing console: https://console.aws.amazon.com/billing/home#

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Accessing AWS

- **AWS Management Console** - http://aws.amazon.com
- **AWS Command Line Interface** https://github.com/aws/aws-cli
- **AWS Software Development Kits** (SDK) https://github.com/aws/aws-cli

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Billing Alerts: Enable alerts

First enable Billing Alerts: This has to be done before you can stet up an alarm.
You must be signed in using AWS account root user credentials; IAM users cannot enable billing alerts for your AWS account.

- Open the Billing and Cost Management console at https://console.aws.amazon.com/billing/home?#.
- In the navigation pane, choose **Preferences**.
- Choose **Receive Billing Alerts**.
- Choose **Save preferences**

https://docs.aws.amazon.com/AmazonCloudWatch/latest/monitoring/monitor_estimated_charges_with_cloudwatch.html#turning_on_billing_metrics

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Important!

- Please keep a close watch on your AWS usage and charges
- Turn off resources when you are not using them
- If you ever get into trouble, contact the course staff immediately

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AWS – Web Console

- Create your SSH keys (used to log into your instances)
https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/ec2-key-pairs.html#having-ec2-create-your-key-pair
- Create a security group (firewall)
https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/using-network-security.html
- Start an EC2 instance (virtual machine)
- Connect to your EC2 instance
- Create a S3 bucket, upload to the bucket.
- Change permissions on the bucket.

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Demo

AWS Console

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EC2 Demo

- Key-pair
  - chmod 400 my-key-pair.pem
- Security Group
  - Inbound
    - SSH –TCP 22, 0.0.0.0/0
    - HTTP 80
    - HTTPS 443
    - Redshift 5439
  - Outbound
    - All, 0.0.0.0/0
- EC2 instance
  - ssh –i my-key-pair.pem ec2-user@<ec2 instance>

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Demo

AWS Command Line

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Python SDK

- Pip install boto3
- AWS Access Key and secret Key need to be set.
  - Option A: Inherits settings from aws cli (`aws configure`)
  - Option B: credential file at ~/.aws/credentials:

```
[default]
aws_access_key_id = YOUR_ACCESS_KEY
aws_secret_access_key = YOUR_SECRET_KEY
```

https://github.com/parmitam/ntbks/blob/master/Demo-boto-s3.ipynb

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Basic Git

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GIT basics

- Install:
  - Download and install (https://git-scm.com/download)
- Create a new repository:
  - create a new directory, open it and execute
    `git init`
    to create a new git repository
- Clone a repository:
  - create a working copy of a local repository by running the command
    `git clone git@gitlab.cs.washington.edu:csed516-19wi/[netid].git`

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GIT basics

- Add and commit:
  - `git add <filename>`
  - `git commit –m "commit message"`
- Pushing changes
  - `git push origin master`
- Update and merge
  - `git pull`
  - `git merge <branch>`

More at: https://book.git-scm.com/

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GitLab

- https://gitlab.cs.washington.edu
  - SSH keys: https://gitlab.cs.washington.edu/help/ssh/README.md
  - HTTPS access: https://gitlab.cs.washington.edu/lab-documentation/gitlabdocumentation/blob/master/https-push.md
- Readings/Homeworks/Project have to be submitted via Gitlab
- A repo for you has been created:
  - csed516-19au/{uw-netid}
  - If the repo does not exist or if you have trouble accessing it, contact a TA.
- To submit Readings/Homeworks/Project
  - Go to the appropriate subfolder.
  - Name your submission appropriately, git add, git commit and git push.

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