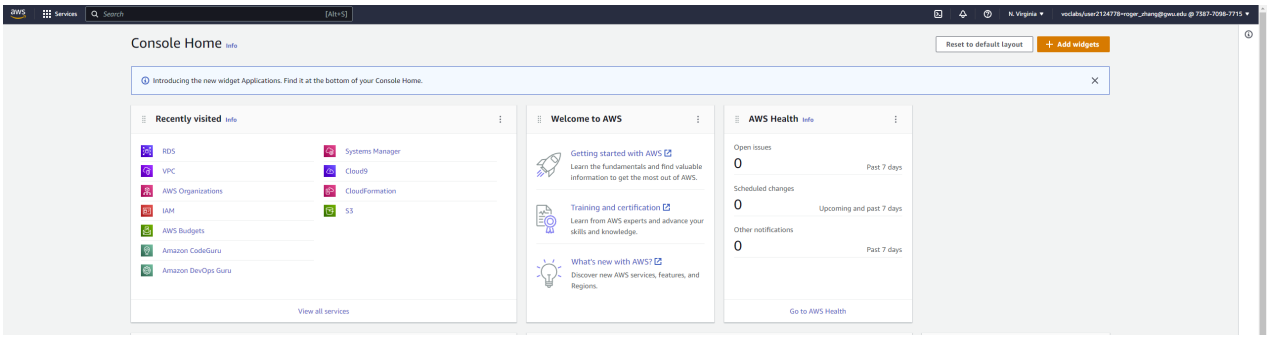
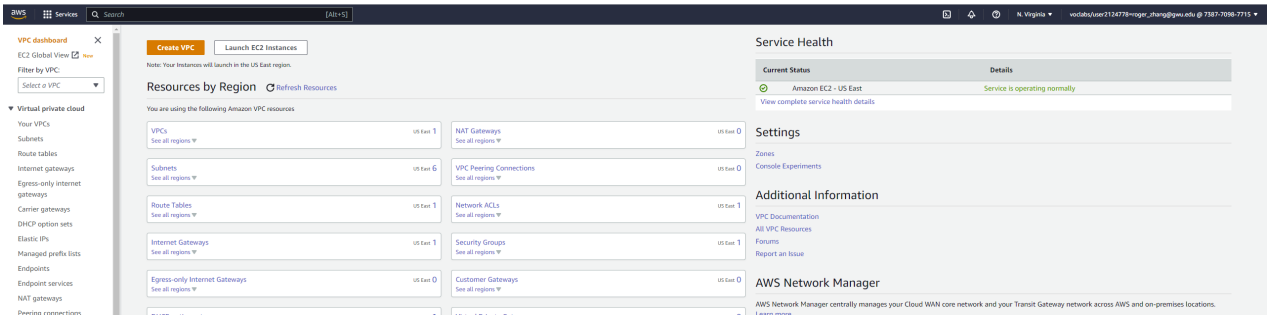
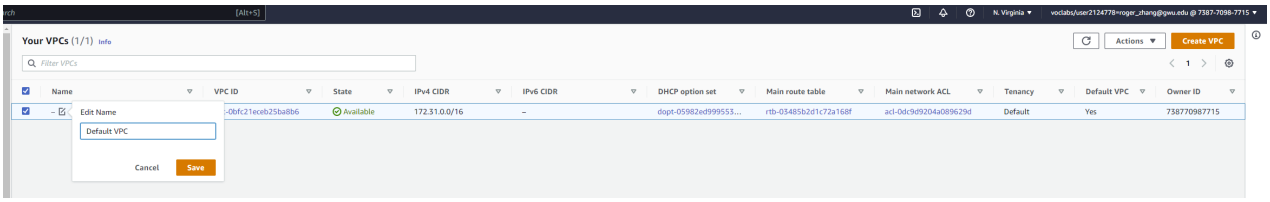
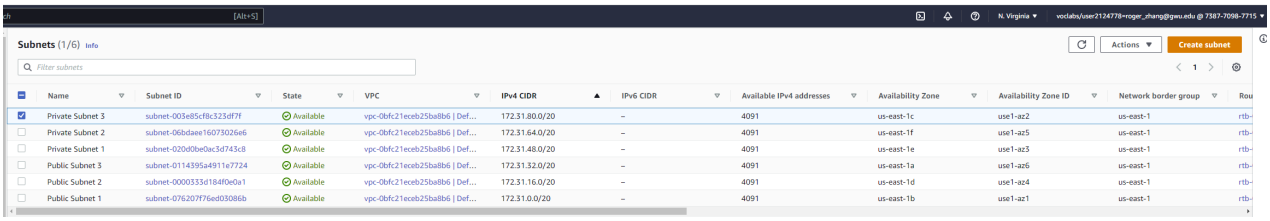
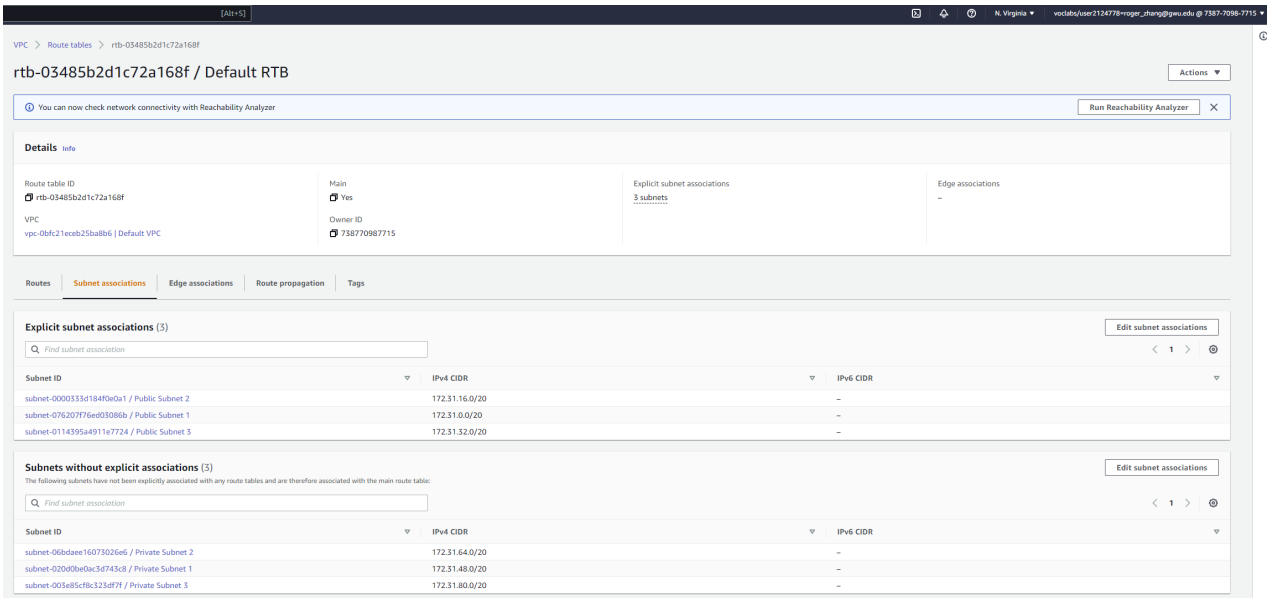
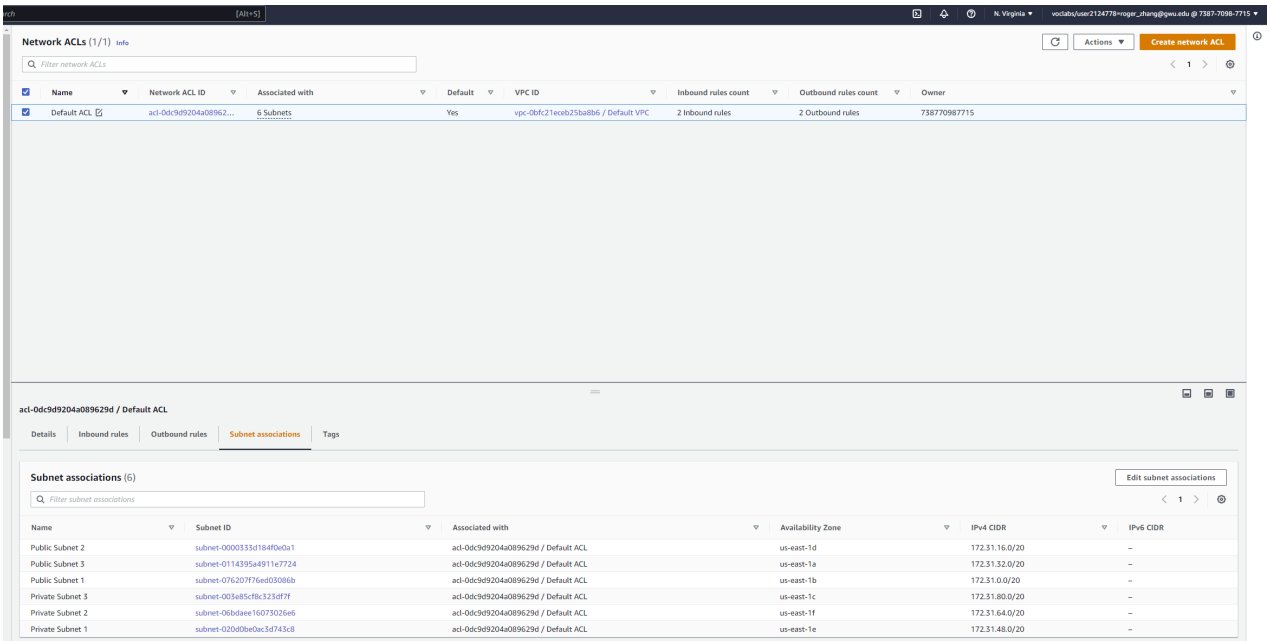
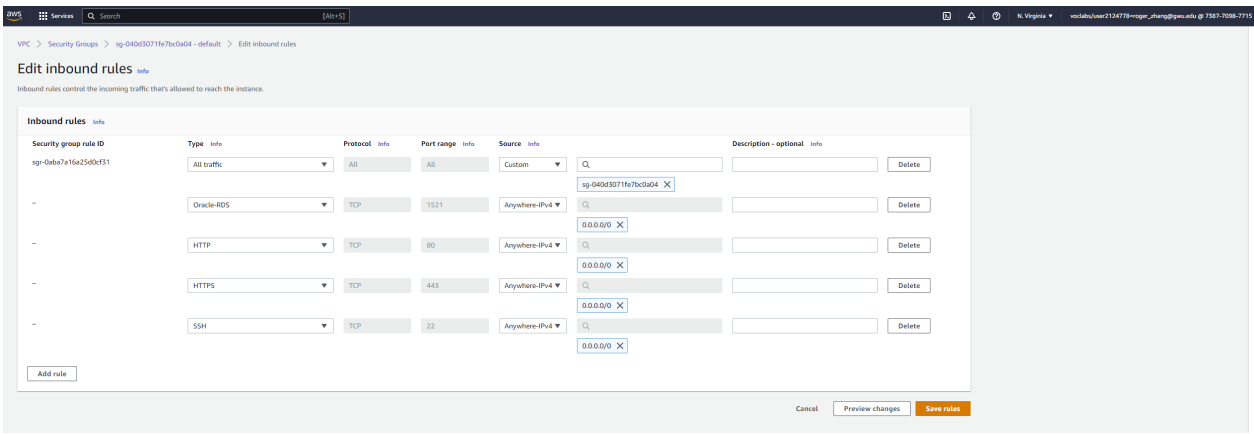
a. Setting Up the Default VPC

- First login
  - 
- make sure the REGION is set to **N. Virginia
  - 
- enter the name **Default VPC**, then click on **Save**
  - 
- **Setting the Name tags for the default subnets.**
  - 
- Subnet Association
  - 
- ACL Association

- 

- SG update
- 

- Lesson learned
  - we saw in detail how to create an on-demand EC2 instance in this tutorial. Because it is an on-demand server, you can keep it running when in use and 'Stop' it when it's unused to save on your costs.
  - I can provision a Linux or Windows EC2 instance or from any of the available AMIs in AWS Marketplace based on your choice of OS platform.
  - If my application is in production and you have to use it for years to come, you should consider provisioning a reserved instance to drastically save on your CAPEX.
  - Here, we saw how to create a Spot Instance request successfully by determining our bid price.
  - Spot instances are a great way to save on costs for instances which are not application critical. A common example would be to create a fleet of spot instances for a task such as image processing or video encoding. In such cases, you can keep a cluster of instances under a load balancer.
  - If the bid price exceeds the spot price and your instance is terminated from AWS's side, you can have other instances doing the processing job for you. You can leverage Auto scaling for this scenario. Avoid using Spot instances for business critical applications like databases etc.

b. Create an RDS Oracle Database

- Create rds first step
- 

PostgreSQL | Oracle | Microsoft SQL Server

Database management type Info
- Amazon RDS
  RDS fully manages your database, including automatic patching. Choose this option if you don't need to customize your environment.
- Amazon RDS Custom
  RDS manages your database and gives you privileged access to the OS. Use this option if you want to customize the database, OS, and infrastructure.

Architecture settings Info
- Multitenant architecture
  A container database (CDB) that can contain pluggable databases (PDBs). A single-tenant CDB contains one PDB.

Edition
- Oracle Enterprise Edition
  Efficient, reliable, and secure database management system that delivers comprehensive high-end capabilities for mission-critical applications and demanding database workloads.
- Oracle Standard Edition Two
  Affordable and full-featured database management system supporting up to 16 vCPUs. Oracle Database Standard Edition Two is a replacement for Standard Edition and Standard Edition One.

License
bring-your-own-license

Engine Version
Oracle 19.0.0.0.ru-2022-10.rur-2022-10.r1

Templates
Choose a sample template to meet your use case.

- Production
  Use defaults for high availability and fast, consistent performance.
- Dev/Test
  This instance is intended for development use outside of a production environment.

Settings

DB instance identifier Info
Type a name for your DB instance. The name must be unique across all DB instances owned by your AWS account in the current AWS Region.
database-1
The DB instance identifier is case-insensitive, but is stored as all lowercase (as in "mydbinstance"). Constraints: 1 to 60 alphanumeric characters or hyphens. First character must be a letter. Can't contain two consecutive hyphens. Can't end with a hyphen.

Credentials Settings

Master username Info
Type a login ID for the master user of your DB instance.
roger-HR
1 to 16 alphanumeric characters. First character must be a letter.
- Auto generate a password
  Amazon RDS can generate a password for you, or you can specify your own password.

Master password Info
••••••••
Constraints: At least 8 printable ASCII characters. Can't contain any of the following: / (slash), '(single quote), "(double quote) and @ (at sign).

Confirm master password Info
••••••••

Instance configuration
The DB instance configuration options below are limited to those supported by the engine that you selected above.

DB instance class Info
- Standard classes (includes m classes)
- Memory optimized classes (includes r and x classes)
- Burstable classes (includes t classes)

db.t3.small
2 vCPUs 2 GiB RAM Network: 2,085 Mbps

- Include additional memory configurations Info
- Include previous generation classes

Storage

Storage type Info
Magnetic
Limited to a maximum of 1,000 IOPS (not recommended)

Allocated storage
10 GiB
(Minimum: 10 GiB. Maximum: 3,072 GiB) Higher allocated storage can improve IOPS performance.

Availability & durability

Multi-AZ deployment Info
- Create a standby instance (recommended for production usage)
  Creates a standby in a different Availability Zone (AZ) to provide data redundancy, eliminate I/O freezes, and minimize latency spikes during system backups.
- Do not create a standby instance

Connectivity Info

Compute resource
Choose whether to set up a connection to a compute resource for this database. Setting up a connection will automatically change connectivity settings so that the compute resource can connect to this database.
- Don't connect to an EC2 compute resource
  Don't set up a connection to a compute resource for this database. You can manually set up a connection to a compute resource later.
- Connect to an EC2 compute resource
  Set up a connection to an EC2 compute resource for this database.

Virtual private cloud (VPC) Info
Choose the VPC. The VPC defines the virtual networking environment for this DB instance.
Default VPC (vpc-0bfc21eceb25ba8b6)
Only VPCs with a corresponding DB subnet group are listed.

After a database is created, you can't change its VPC.

DB Subnet group Info
Choose the DB subnet group. The DB subnet group defines which subnets and IP ranges the DB instance can use in the VPC that you selected.
default

Public access Info
- Yes
  RDS assigns a public IP address to the database. Amazon EC2 instances and other resources outside of the VPC can connect to your database. Resources inside the VPC can also connect to the database. Choose one or more VPC security groups that specify which resources can connect to the database.
- No
  RDS doesn't assign a public IP address to the database. Only Amazon EC2 instances and other resources inside the VPC can connect to your database. Choose one or more VPC security groups that specify which resources can connect to the database.

VPC security group (firewall) Info
Choose one or more VPC security groups to allow access to your database. Make sure that the security group rules allow the appropriate incoming traffic.
- Choose existing
  Choose existing VPC security groups
- Create new
  Create new VPC security group

Existing VPC security groups
Choose one or more options
default

Availability Zone Info
No preference

Additional configuration

Database authentication

Database authentication options Info
- Password authentication
  Authenticates using database passwords.
- Password and Kerberos authentication
  Choose a directory in which you want to allow authorized users to authenticate with this DB instance using Kerberos Authentication.

Monitoring

Performance Insights Info

- Turn on Performance Insights Info

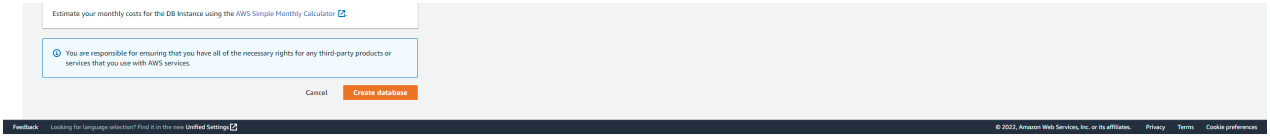
Additional configuration
Enhanced Monitoring

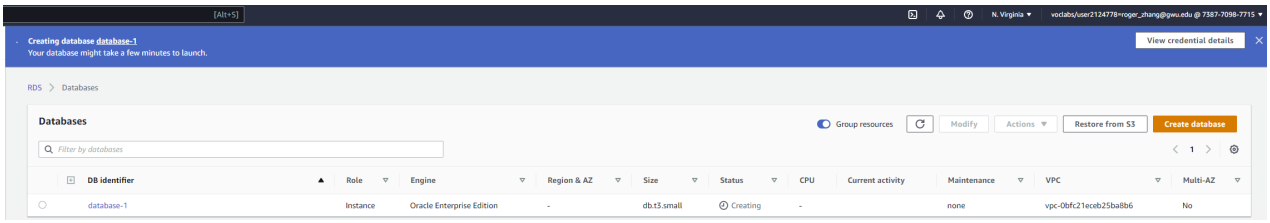
Additional configuration
Database options, encryption turned on, backup turned on, backtrack turned off, maintenance, CloudWatch Logs, delete protection turned off.

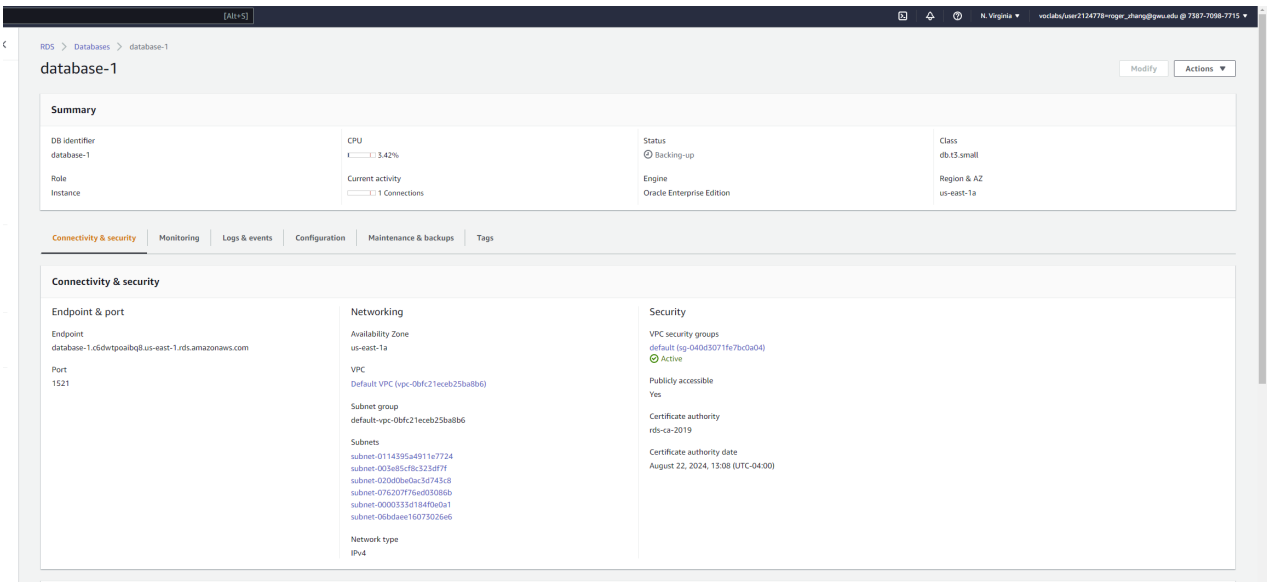
Estimated monthly costs

DB instance	24.82 USD
Storage	1.00 USD
Total	**25.82 USD**

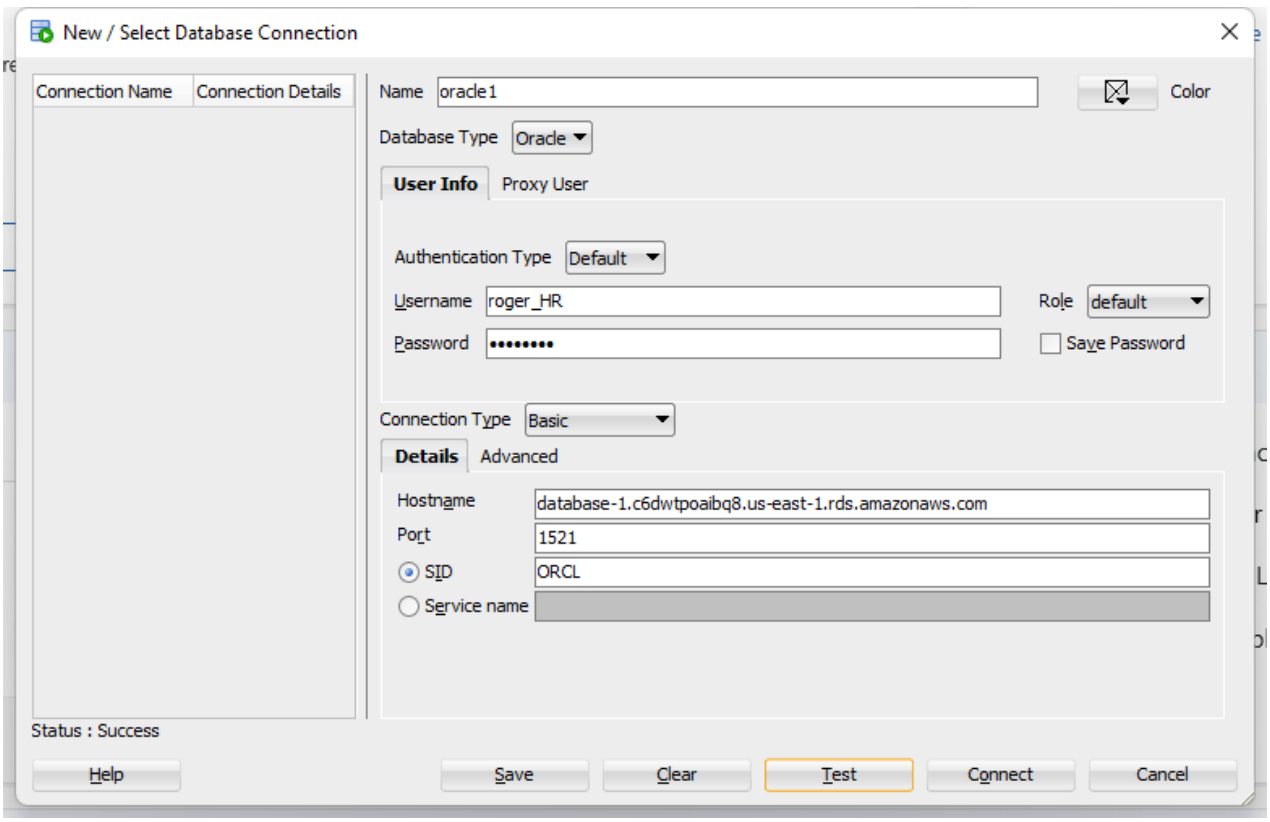
This billing estimate is based on on-demand usage as described in Amazon RDS Pricing. Estimate does not include costs for backup storage, IOs (if applicable), or data transfer.



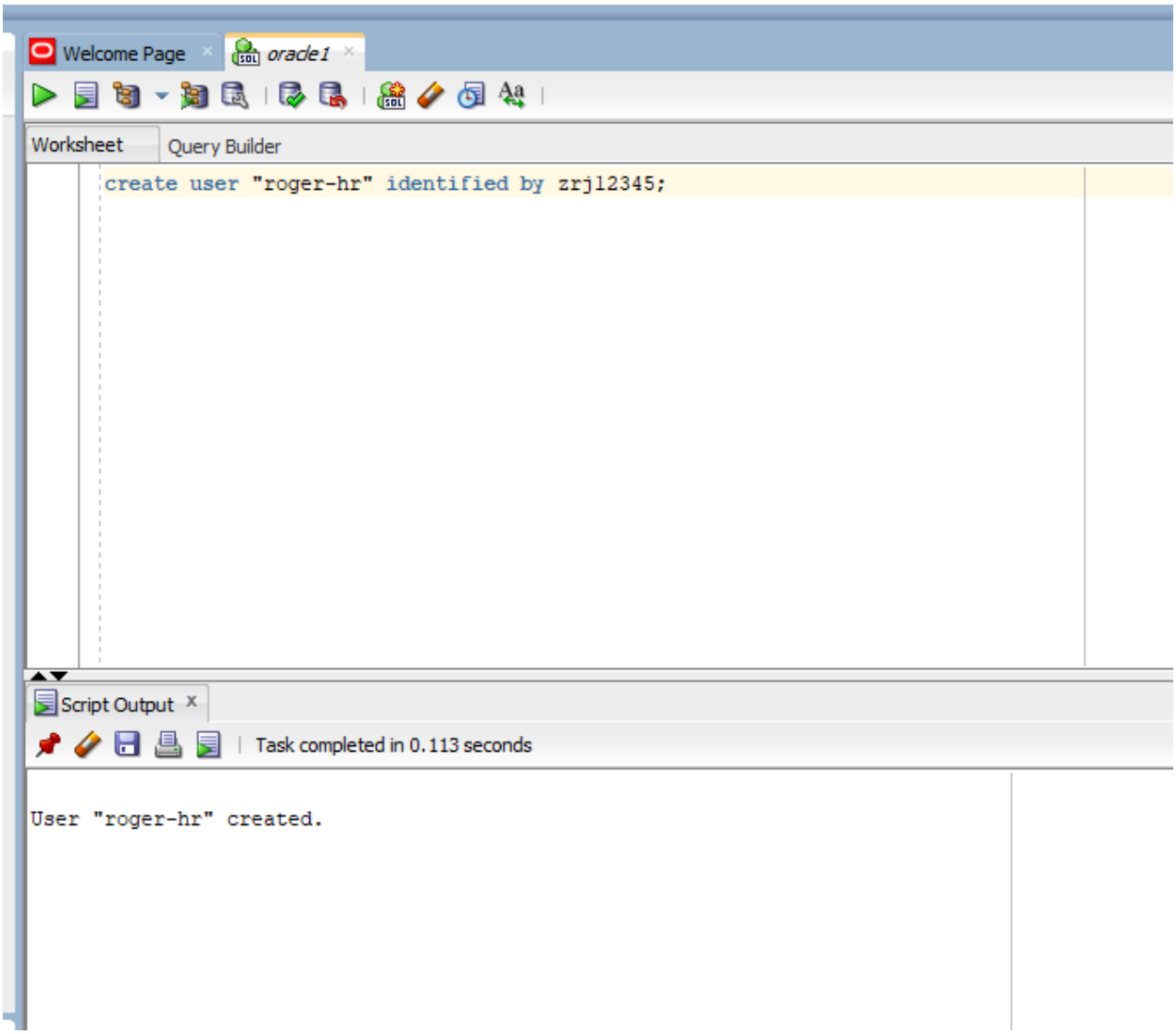
- RDS creating
  - 

- RDS created
  - 

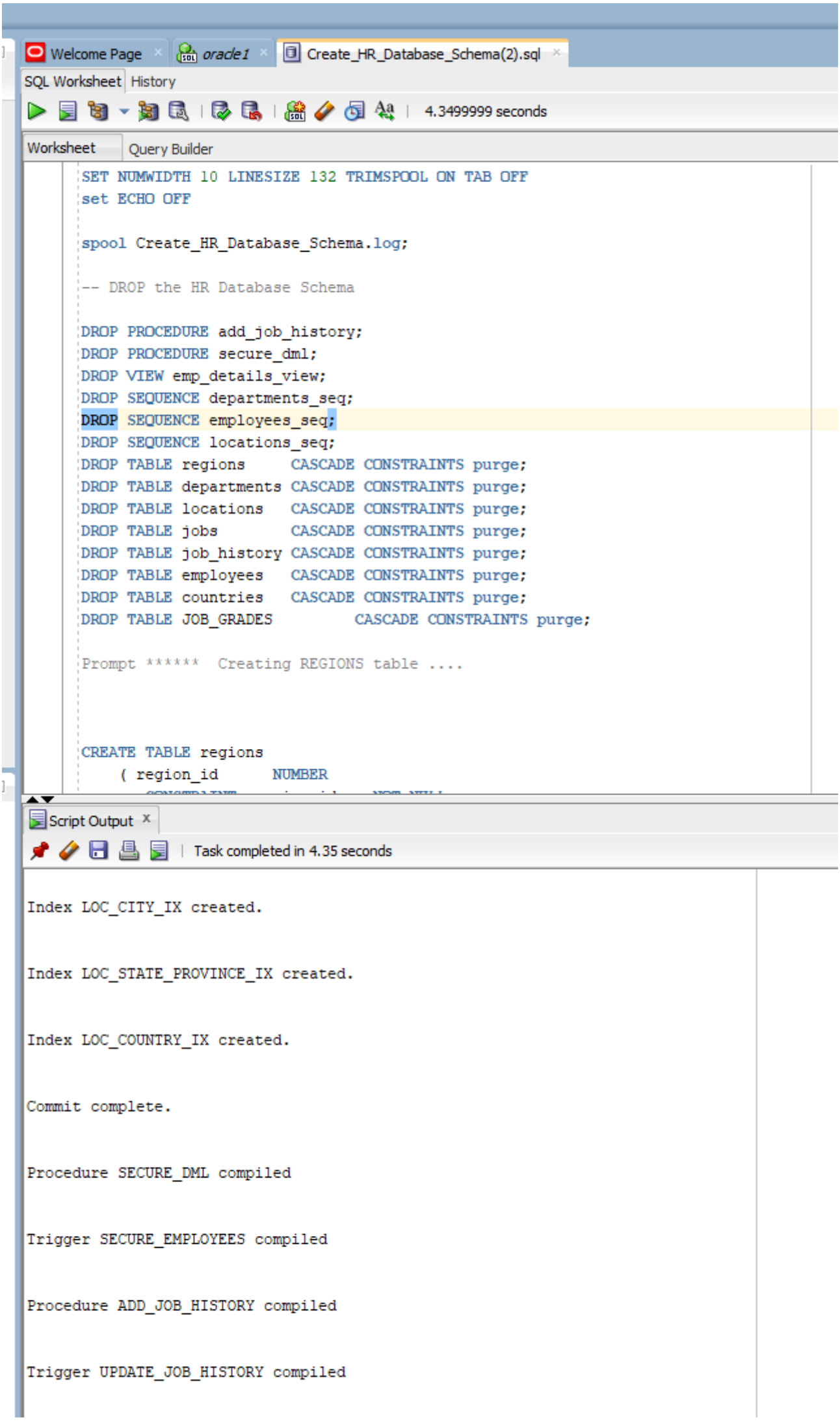
c. Create an Oracle userid “-HR"

- Connect to RDS
  - 

- create user

- 

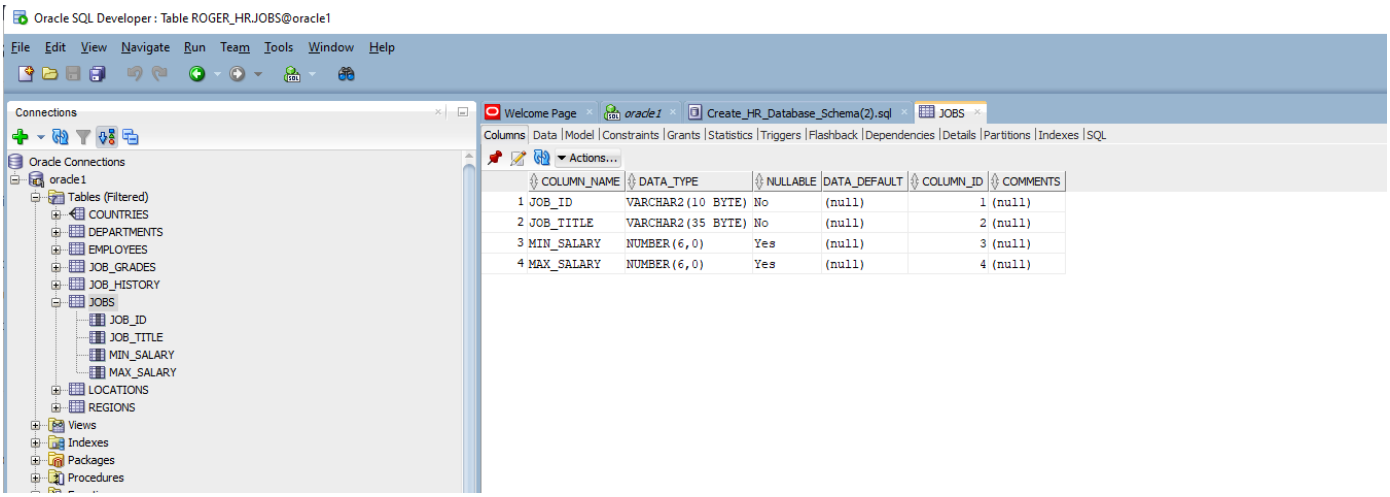
d. Load the HR Database Schema


Welcome Page
oracle1
Create_HR_Database_Schema(2).sql
SQL Worksheet
History
4.3499999 seconds
Worksheet
Query Builder
SET NUMWIDTH 10 LINESIZE 132 TRIMSPOOL ON TAB OFF
set ECHO OFF
spool Create_HR_Database_Schema.log;
-- DROP the HR Database Schema
DROP PROCEDURE add_job_history;
DROP PROCEDURE secure_dml;
DROP VIEW emp_details_view;
DROP SEQUENCE departments_seq;
DROP SEQUENCE employees_seq;
DROP SEQUENCE locations_seq;
DROP TABLE regions CASCADE CONSTRAINTS purge;
DROP TABLE departments CASCADE CONSTRAINTS purge;
DROP TABLE locations CASCADE CONSTRAINTS purge;
DROP TABLE jobs CASCADE CONSTRAINTS purge;
DROP TABLE job_history CASCADE CONSTRAINTS purge;
DROP TABLE employees CASCADE CONSTRAINTS purge;
DROP TABLE countries CASCADE CONSTRAINTS purge;
DROP TABLE JOB_GRADES CASCADE CONSTRAINTS purge;
Prompt ****** Creating REGIONS table ....
CREATE TABLE regions
(region_id NUMBER
Script Output
Task completed in 4.35 seconds
Index LOC_CITY_IX created.
Index LOC_STATE_PROVINCE_IX created.
Index LOC_COUNTRY_IX created.
Commit complete.
Procedure SECURE_DML compiled
Trigger SECURE_EMPLOYEES compiled
Procedure ADD_JOB_HISTORY compiled
Trigger UPDATE_JOB_HISTORY compiled

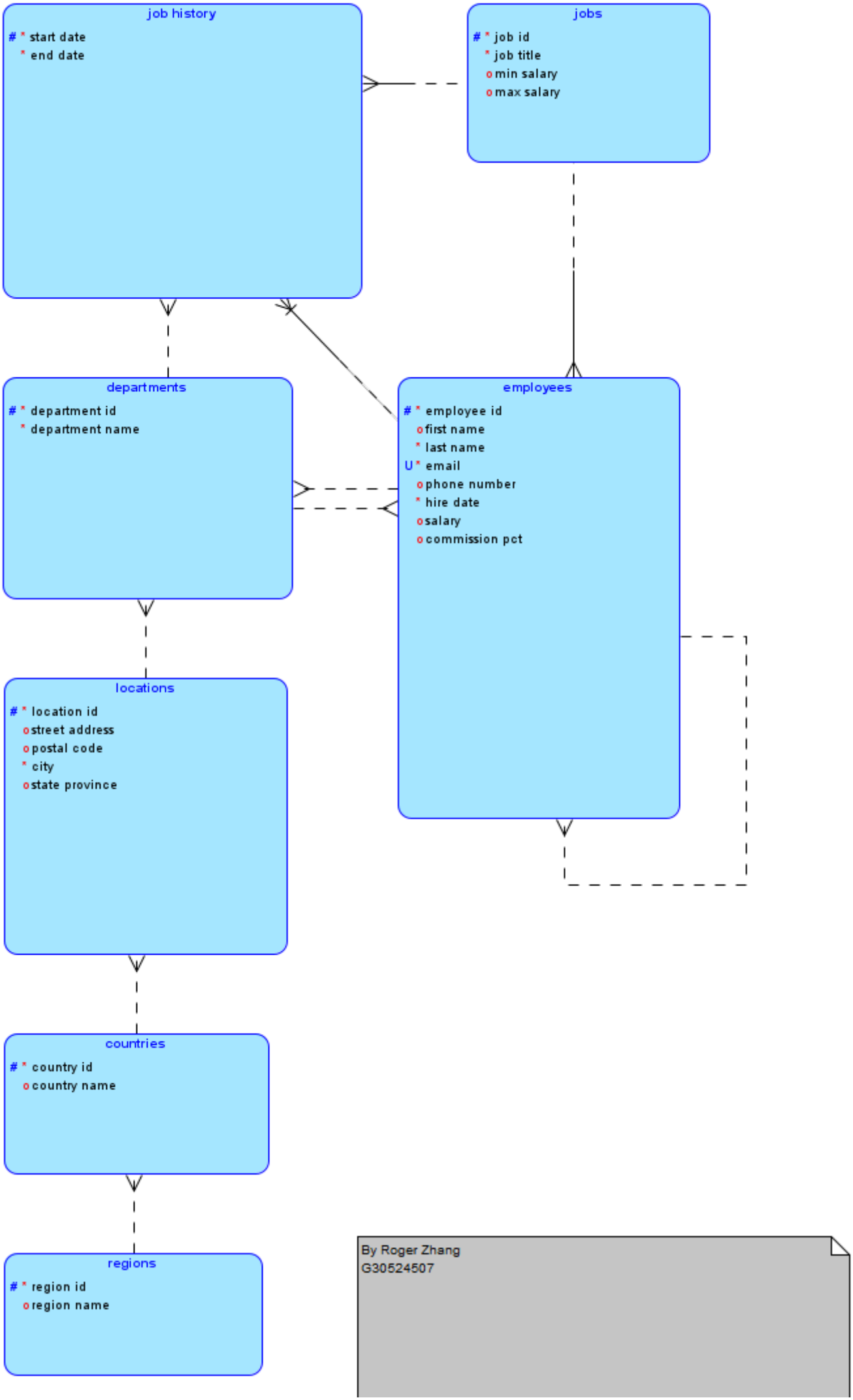
```
Commit complete.
```

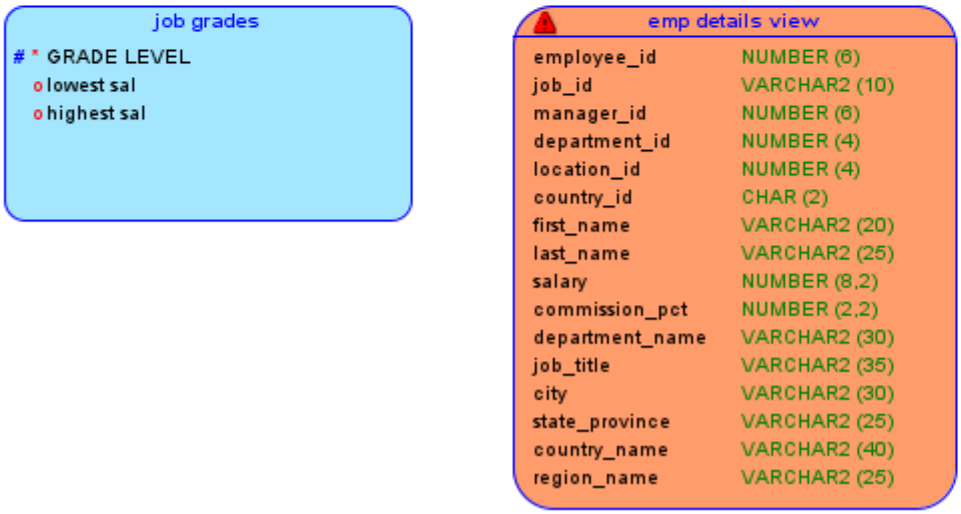
e. Connect with the Oracle SQL Developer and load the HR Database schema

f. Connect to the HR Database Schema using the Oracle SQL Developer

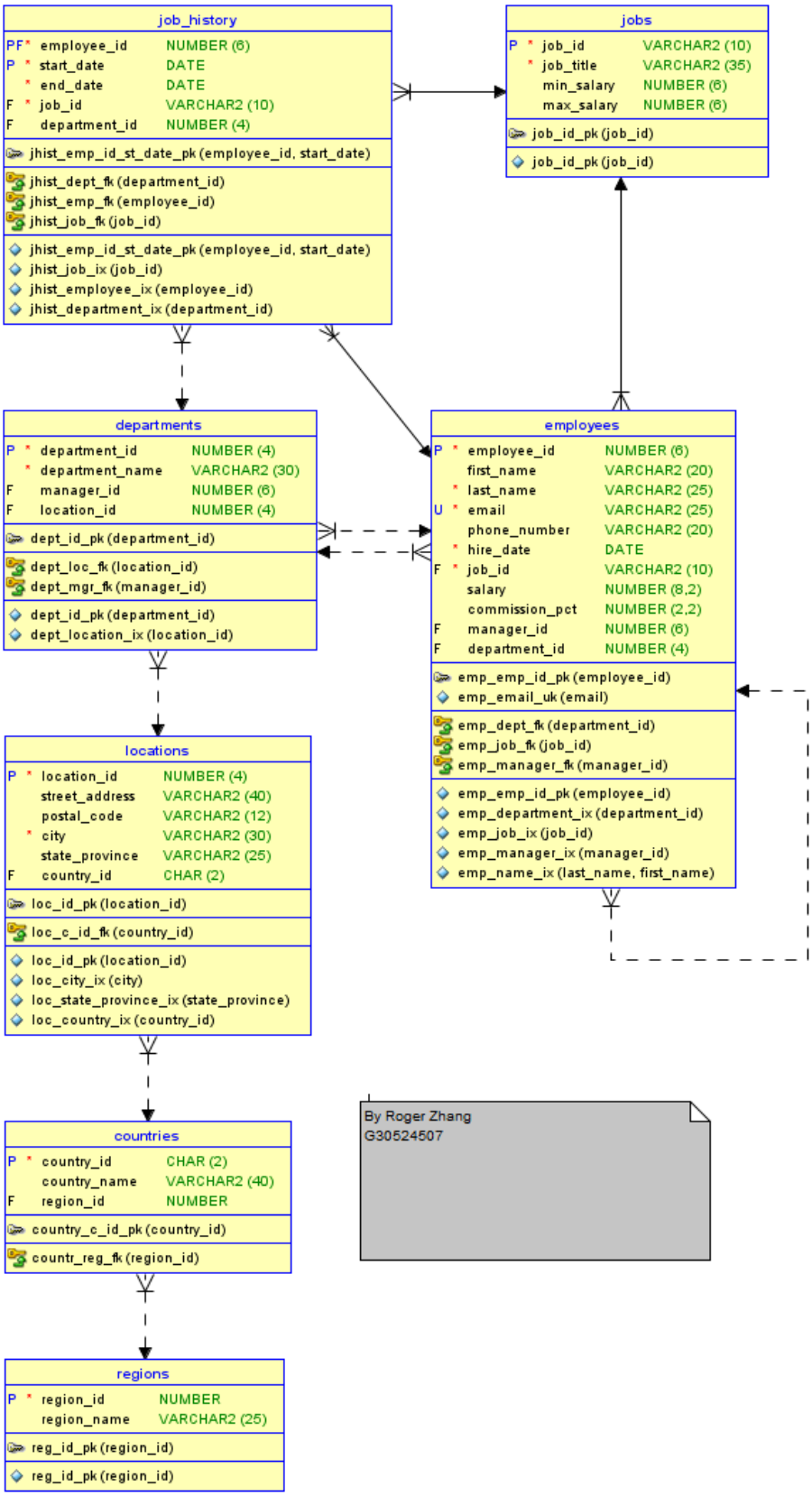


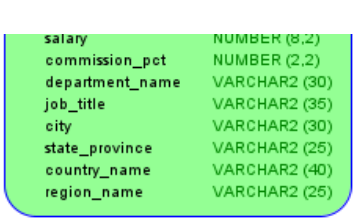
g. Use the Oracle Data Modeler to reverse engineer your Oracle Database Schema into and ER Diagram (Logical)


job history
* start date
* end date
jobs
* job id
* job title
o min salary
o max salary
departments
* department id
* department name
employees
* employee id
o first name
* last name
U * email
o phone number
* hire date
o salary
o commission pct
locations
* location id
o street address
o postal code
* city
o state province
countries
* country id
o country name
regions
* region id
o region name
By Roger Zhang
G30524507



h. Reverse Engineer the ER into a Relational Diagram


job_history
PF* employee_id NUMBER (6)
P * start_date DATE
* end_date DATE
F * job_id VARCHAR2 (10)
F department_id NUMBER (4)
jhist_emp_id_st_date_pk (employee_id, start_date)
jhist_dept_fk (department_id)
jhist_emp_fk (employee_id)
jhist_job_fk (job_id)
jhist_emp_id_st_date_pk (employee_id, start_date)
jhist_job_ix (job_id)
jhist_employee_ix (employee_id)
jhist_department_ix (department_id)
jobs
P * job_id VARCHAR2 (10)
* job_title VARCHAR2 (35)
min_salary NUMBER (6)
max_salary NUMBER (6)
job_id_pk (job_id)
job_id_pk (job_id)
departments
P * department_id NUMBER (4)
* department_name VARCHAR2 (30)
F manager_id NUMBER (6)
F location_id NUMBER (4)
dept_id_pk (department_id)
dept_loc_fk (location_id)
dept_mgr_fk (manager_id)
dept_id_pk (department_id)
dept_location_ix (location_id)
employees
P * employee_id NUMBER (6)
first_name VARCHAR2 (20)
* last_name VARCHAR2 (25)
U * email VARCHAR2 (25)
phone_number VARCHAR2 (20)
* hire_date DATE
F * job_id VARCHAR2 (10)
salary NUMBER (8,2)
commission_pct NUMBER (2,2)
F manager_id NUMBER (6)
F department_id NUMBER (4)
emp_emp_id_pk (employee_id)
emp_email_uk (email)
emp_dept_fk (department_id)
emp_job_fk (job_id)
emp_manager_fk (manager_id)
emp_emp_id_pk (employee_id)
emp_department_ix (department_id)
emp_job_ix (job_id)
emp_manager_ix (manager_id)
emp_name_ix (last_name, first_name)
locations
P * location_id NUMBER (4)
street_address VARCHAR2 (40)
postal_code VARCHAR2 (12)
* city VARCHAR2 (30)
state_province VARCHAR2 (25)
F country_id CHAR (2)
loc_id_pk (location_id)
loc_c_id_fk (country_id)
loc_id_pk (location_id)
loc_city_ix (city)
loc_state_province_ix (state_province)
loc_country_ix (country_id)
By Roger Zhang
G30524507
countries
P * country_id CHAR (2)
country_name VARCHAR2 (40)
F region_id NUMBER
country_c_id_pk (country_id)
countr_reg_fk (region_id)
regions
P * region_id NUMBER
region_name VARCHAR2 (25)
reg_id_pk (region_id)
reg_id_pk (region_id)
job_grades
P * GRADE_LEVEL VARCHAR2 (3)
lowest_sal NUMBER (6)
highest_sal NUMBER (6)
job_grades_id_pk (GRADE_LEVEL)
job_grades_id_pk (GRADE_LEVEL)
emp_details_view
employee_id NUMBER (6)
job_id VARCHAR2 (10)
manager_id NUMBER (6)
department_id NUMBER (4)
location_id NUMBER (4)
country_id CHAR (2)
first_name VARCHAR2 (20)
last_name VARCHAR2 (25)



i. All the diagrams must have a LEGENT in the graph

See above diagrams