

# Deploy a Modern Web App connected to a Cloud Spanner Instance

GSP1051



- OmegaTrade builds a Node.js/Express stock price visualization app connected to Cloud Spanner with default connection pooling.
- Deploys backend API service, imports sample trade data, then launches frontend with Google Charts rendering.
- **Deployment Steps**
  - Backend: Deploy Express server to Cloud Run/App Engine → Configure Spanner client (`@google-cloud/spanner`).
  - Data Load: Import CSV/JSON stock trades via DML or client library batch mutations.
- **Frontend Operations**
  - Access web UI → Query Spanner for price history → Visualize trends/candlesticks using Google Charts API.



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Time limit

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[Learn more.](#)[Open Google Cloud console](#)

Username

student-00-1fb52fc512f00



Password

aX2Lo6iD7jmK



Project ID

qwiklabs-gcp-00-eed4479



3. (Optional) You can list the active account name with this command:

`gcloud auth list`4. Click **Authorize**.**Output:**

```
ACTIVE: *
ACCOUNT: student-00-1fb52fc512f0@qwiklabs.net
```

To **set** the active account, run:

`$ gcloud config set account 'ACCOUNT'`

5. (Optional) You can list the project ID with this command:

`gcloud config list project`**Output:**[Previous](#)[Next](#) >

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Welcome to Cloud Shell! Type "help" to get started, or type "gemini" to try prompting with Gemini CLI.  
Your Cloud Platform project in this session is set to **qwiklabs-gcp-00-eed44799d6a7**.  
Use `gcloud config set project [PROJECT\_ID]` to change to a different project.  
student\_00\_1fb52fc512f0@cloudshell:~ (qwiklabs-gcp-00-eed44799d6a7)\$ gcloud auth list  
Credentialed Accounts

ACTIVE: \*

ACCOUNT: student-00-1fb52fc512f0@qwiklabs.net

To set the active account, run:  
\$ gcloud config set account `ACCOUNT`

student\_00\_1fb52fc512f0@cloudshell:~ (qwiklabs-gcp-00-eed44799d6a7)\$ gcloud config list project  
[core]  
project = qwiklabs-gcp-00-eed44799d6a7

Your active configuration is: [cloudshell-22963]  
student\_00\_1fb52fc512f0@cloudshell:~ (qwiklabs-gcp-00-eed44799d6a7)\$

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Password

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Project ID

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## Task 1. Enable required Google Cloud APIs

First enable the Google Cloud APIs for Cloud Spanner, Artifact Registry, and Cloud Run.

1. In the **Cloud Shell** enter the following commands:

```
gcloud services enable spanner.googleapis.com
gcloud services enable artifactregistry.googleapis.com
gcloud services enable run.googleapis.com
```

## Task 2. Download and inspect the application code

1. Download the code repository for use in this lab. In the **Cloud Shell** enter the following:

```
git clone https://github.com/GoogleCloudPlatform/training-data-analyst
```

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```
student_00_1fb52fc512f0@cloudshell:~ (qwiklabs-gcp-00-eed44799d6a7)$ gcloud services enable spanner.googleapis.com
gcloud services enable artifactregistry.googleapis.com
gcloud services enable run.googleapis.com
Operation "operations/acat.p2-109287812022-f4242597-3ccd-481e-b146-fad7689e0d54" finished successfully.
Operation "operations/acf.p2-109287812022-385cbc9-1681-4868-99a9-37b389e99b16" finished successfully.
student_00_1fb52fc512f0@cloudshell:~ (qwiklabs-gcp-00-eed44799d6a7)$
```

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Project ID

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## Task 2. Download and inspect the application code

1. Download the code repository for use in this lab. In the **Cloud Shell** enter the following:

```
git clone https://github.com/GoogleCloudPlatform/training-data-analyst
```

2. Navigate to the folder containing the application code.

```
cd training-data-analyst/courses/cloud-spanner/omegatrade/
```

3. The code is divided primarily into two parts, backend and frontend. The application architecture is depicted in the diagram below:

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```
student_00_1fb52fc512f0@cloudshell:~ (qwiklabs-gcp-00-eed44799d6a7)$ git clone https://github.com/GoogleCloudPlatform/training-data-analyst
Cloning into 'training-data-analyst'...
remote: Enumerating objects: 68314, done.
remote: Counting objects: 100% (8/8), done.
remote: Compressing objects: 100% (6/6), done.
remote: Total 68314 (delta 2), reused 1 (delta 1), pack-reused 68306 (from 1)
Receiving objects: 100% (68314/68314), 705.90 MiB | 17.67 MiB/s, done.
Resolving deltas: 100% (43981/43981), done.
Updating files: 100% (12917/12917), done.
student_00_1fb52fc512f0@cloudshell:~ (qwiklabs-gcp-00-eed44799d6a7)$ cd training-data-analyst/courses/cloud-spanner/omegatrade/
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade (qwiklabs-gcp-00-eed44799d6a7)$
```

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Password

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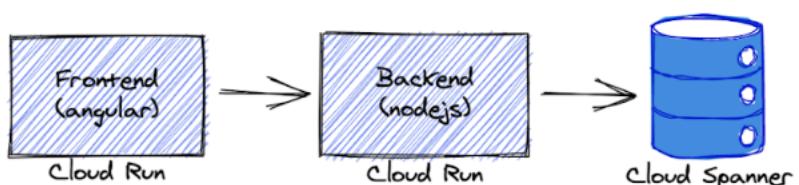
qwiklabs-gcp-00-eed4479f



cd training-data-analyst/courses/cloud-spanner/omegatrade/



3. The code is divided primarily into two parts, backend and frontend. The application architecture is depicted in the diagram below:



4. The application relies on a deployment-specific file named `.env` to successfully communicate with the Cloud Spanner instance. You will create this file in the next task.

5. With respect to the backend, some of the bindings and interactions with the Cloud Spanner tables are managed by Node.js models - three of these `company.model.js`, `simulation.model.js`, and `user.model.js` - reside in the `models` folder. Issue the following command to navigate to the models folder:

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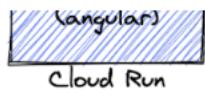
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```
cd backend/app/models
```



6. Issue the following command to inspect the **company.model.js** file. This file contains database operations to interact with the **companies** table.

```
more company.model.js
```

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5. With respect to the backend, some of the bindings and interactions with the Cloud Spanner tables are managed by Node.js models - three of these **company.model.js**, **simulation.model.js**, and **user.model.js** - reside in the **models** folder. Issue the following command to navigate to the models folder:

```
cd backend/app/models
```



6. Issue the following command to inspect the **company.model.js** file. This file contains database operations to interact with the **companies** table.

```
more company.model.js
```



Press the spacebar to advance through the file until its end. If you wish to close the file early, type **q** to close the **more** command.

7. Some of the frontend interactions with these models and other structures in the Node.js backend occur through Angular components located in the **components** folder. Issue the following command to navigate to the components folder:

```
cd ../../../../../../frontend/src/app/components
```



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Press the spacebar to advance through the file until its end. If you wish to close the file early, type **q** to close the **more** command.

- Some of the frontend interactions with these models and other structures in the Node.js backend occur through Angular components located in the **components** folder. Issue the following command to navigate to the components folder:

```
cd ../../../../frontend/src/app/components
```



- For instance, the **company** component contains the base application code to manage and update company information.

- Issue the following command to inspect the **manage-company.component.ts** TypeScript configuration file. This file contains methods for deleting or editing a company, among other actions.

```
more company/manage-company/manage-company.component.ts
```



Press the spacebar to advance through the file until its end. If you wish to close the file early, type **q** to close the **more** command.

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```
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student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/backend/app/models (qwiklabs-gcp-00-eed44799d6a7)$
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/backend/app/models (qwiklabs-gcp-00-eed44799d6a7)$ more company
.model.js
'use strict';
const database = require('../config/database.js');
const Company = function () { };

Company.getAll = async function () {
  const [companies] = await database.run({
    sql: `SELECT companyId , companyName , companyShortCode , created_at
          FROM companies ORDER BY created_at DESC`,
    json: true,
  });
  return companies;
}

Company.create = async function (companyObj) {
  await database.table('companies').insert(companyObj);
  return companyObj.companyId
};

Company.checkCompany = async function (companyName, companyShortCode) {
  const company = await database.run({
    sql: `SELECT companyName , companyShortCode
          FROM companies
          WHERE companyName = @companyName OR companyShortCode = @companyShortCode
          LIMIT 1`,
    params: {
      companyName: companyName,
      companyShortCode: companyShortCode
    }
  });
  return company;
}
```

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```
return company;
};

Company.delete = async function (companyId) {
    return await database.table('companies').deleteRows([companyId]);
}

Company.update = async function (companyObj) {
    return await database.table('companies').update([companyObj]);
}

Company.findById = async function (companyId) {
    return await database.run({
        sql: `SELECT companyId , companyName , companyShortCode , created_at
              FROM companies
              WHERE companyId = @companyId`,
        params: {
            companyId: companyId,
        },
        json: true
    });
}

Company.createStockData = async function (stockData) {
    return database.table('companyStocks').insert(stockData)
};

Company.deleteStockData = async function (companyId) {
    const [rowCount] = await database.runPartitionedUpdate({
        sql: 'DELETE FROM companyStocks WHERE companyId = @companyId',
--More-- (60%)

```

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```
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```

```
params: { companyId: companyId }
});
return rowCount;
}

Company.getCompanySimulation = async function (companyId) {
const fields = `companies.companyId, companies.companyName, companies.companyShortCode, simulations.status, simulations.sId`
const query = `SELECT ${fields}
FROM companies
INNER JOIN simulations ON companies.companyId = simulations.companyId
WHERE companies.companyId = @companyId
ORDER BY simulations.createdAt DESC
LIMIT 1`;
const [result] = await database.run({
  sql: query,
  params: { companyId: companyId },
  json: true
});
return result;
};

Company.getStocks = async function (companyId, date = null) {
const conditions = ['companyId = @companyId'];
const values = { companyId: companyId };
if (date) {
  conditions.push('date > @date');
  values.date = date;
}
const [stockResult] = await database.run({
  sql: `SELECT date , currentValue
--More-- (92%)
```

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```
WHERE companies.companyId = @companyId
ORDER BY simulations.createdAt DESC
LIMIT 1`  
const [result] = await database.run({
  sql: query,
  params: { companyId: companyId },
  json: true
});
return result;
};

Company.getStocks = async function (companyId, date = null) {
  const conditions = ['companyId = @companyId'];
  const values = { companyId: companyId };
  if (date) {
    conditions.push('date > @date');
    values.date = date;
  }
  const [stockResult] = await database.run({
    sql: `SELECT date , currentValue
          FROM companyStocks
          WHERE ${conditions.join(' AND ')}`  
        ORDER BY date`,
    params: values,
    json: true
  );
  return stockResult;
}

module.exports = Company
```

student\_00\_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/backend/app/models (qwiklabs-gcp-00-eed44799d6a7) \$

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```
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/backend/app/models (qwiklabs-gcp-00-eed44799d6a7)$ cd ../../..  
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/frontend/src/app/components (qwiklabs-gcp-00-eed44799d6a7)$  
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/frontend/src/app/components (qwiklabs-gcp-00-eed44799d6a7)$
```

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```
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/frontend/src/app/components (qwiklabs-gcp-00-eed44799d6a7)$
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/frontend/src/app/components (qwiklabs-gcp-00-eed44799d6a7)$ more company/manage-company/manage-company.component.ts
import { Component, ViewChild, OnInit } from '@angular/core';
import { MatSort } from '@angular/material/sort';
import { MatPaginator } from '@angular/material/paginator';
import { MatTableDataSource } from '@angular/material/table';
import { MatDialog } from '@angular/material/dialog';
import { UpdateCompanyComponent } from '../update-company/update-company.component';
import { ConfirmDialogModel, ConfirmDialogComponent } from '../../../../../confirm-dialog/confirm-dialog.component';
import { RestService } from '../../../../../services/rest.service';
import { MatSnackBarService } from '../../../../../services/snackbar.service';
import { take } from "rxjs/operators";

@Component({
  selector: 'app-manage-company',
  templateUrl: './manage-company.component.html',
  styleUrls: ['./manage-company.component.css']
})

export class ManageCompanyComponent implements OnInit {
  displayedColumns: string[] = ['companyName', 'companyShortCode', 'action'];
  dataSource: MatTableDataSource<CompanyData>;
  @ViewChild(MatPaginator, { static: true }) paginator: MatPaginator;
  @ViewChild(MatSort) sort: MatSort;
  searchInput: String;
  loader: boolean = false;

  constructor(private snackBarService: MatSnackBarService, private restService: RestService, public dialog: MatDialog) {
```

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```
import { Component, ViewChild, OnInit } from '@angular/core';
import { MatSort } from '@angular/material/sort';
import { MatPaginator } from '@angular/material/paginator';
import { MatTableDataSource } from '@angular/material/table';
import { MatDialog } from '@angular/material/dialog';
import { UpdateCompanyComponent } from '../update-company/update-company.component';
import { ConfirmDialogModel, ConfirmDialogComponent } from '../../../../../confirm-dialog/confirm-dialog.component';
import { RestService } from '../../../../../services/rest.service';
import { MatSnackBarService } from '../../../../../services/snackbar.service';
import { take } from "rxjs/operators";

@Component({
  selector: 'app-manage-company',
  templateUrl: './manage-company.component.html',
  styleUrls: ['./manage-company.component.css']
})

export class ManageCompanyComponent implements OnInit {
  displayedColumns: string[] = ['companyName', 'companyShortCode', 'action'];
  dataSource: MatTableDataSource<CompanyData>;
  @ViewChild(MatPaginator, { static: true }) paginator: MatPaginator;
  @ViewChild(MatSort) sort: MatSort;
  searchInput: String;
  loader: boolean = false;

  constructor(private snackBarService: MatSnackBarService, private restService: RestService, public dialog: MatDialog) {}

  /**
   * Function to Initiate component.
--More-- (31%)
```

9+ 10°C Clear

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Dashboard – qwiklabs-gcp-00-eed44799d6a7 x +

https://console.cloud.google.com/home/dashboard?project=qwiklabs-gcp-00-eed44799d6a7&pli=1&cloudshell=true

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```
/*
ngOnInit(): void {
  this.getCompanies();
}

initDataSource() {
  this.dataSource.paginator = this.paginator;
  this.dataSource.sort = this.sort;
}

/**
 * Function to get the company List.
 *
 * return {null}
 */
getCompanies() {
  this.loader = true;
  this.restService.getData('companies/list')
    .pipe(take(1))
    .subscribe(response => {
      if (response && response.success) {
        this.dataSource = new MatTableDataSource(response.data);
        this.initDataSource();
      }
      this.loader = false;
    },
    error => {
      this.loader = false;
      if(error && error.error && error.error.message) {
--More-- (47%)
```

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CLOUD SHELL

```
        this.snackBarService.openSnackBar(error.error.message, '');

    }
});}

/**
 * Function to delete a company.
 *
 * return {null}
 */
deleteCompany(companyObj) {
  const dialogData = new ConfirmDialogModel("Confirm Action", `Are you sure you want to delete company ${companyObj.companyName}?`);
  const dialogRef = this.dialog.open(ConfirmDialogComponent, {
    maxWidth: "400px",
    data: dialogData
});
dialogRef.afterClosed().pipe(take(1)).subscribe(dialogResult => {
  if (dialogResult === true) {
    this.loader = true;
    this.restService.deleteData(`companies/delete/${companyObj.companyId}`)
      .pipe(take(1))
      .subscribe(response => {
        if (response && response.success) {
          const index = this.dataSource.data.findIndex(company => company.companyId === companyObj.companyId);
          if (index > -1) {
            this.dataSource.data.splice(index, 1);
            this.dataSource = new MatTableDataSource(this.dataSource.data);
            this.initDataSource();
          }
          this.snackBarService.openSnackBar(response.message, '');
        }
      })
    }
  }
--More-- (76%)
```

9+ 10°C Clear

Search

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CLOUD SHELL

```
        }
      this.loader = false;
    },
    error => {
      this.loader = false;
      if(error && error.error && error.error.message){
        this.snackBarService.openSnackBar(error.error.message, '');
      }
    });
  );
}

/**
 * Function to open create/edit company dialog
 * @param row contains company object
 */
openCompanyDialog(row = null): void {
  const dialogRef = this.dialog.open(UpdateCompanyComponent, {
    width: '400px',
    data: row
  });
  dialogRef.afterClosed().pipe(take(1)).subscribe(response => {
    if (response && response.success) {
      this.getCompanies()
    }
  });
}

/**
--More-- (93%)
```

9+ 10°C Clear

Search

Search

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CLOUD SHELL Terminal (qwiklabs-gcp-00-eed44799d6a7) + Open Editor

```
* Function to open create/edit company dialog
* @param row contains company object
*/
openCompanyDialog(row = null): void {
  const dialogRef = this.dialog.open(UpdateCompanyComponent, {
    width: '400px',
    data: row
  });
  dialogRef.afterClosed().pipe(take(1)).subscribe(response => {
    if (response && response.success) {
      this.getCompanies()
    }
  });
}

/**
 * Function to filter the companies based on user input
 */
applyFilter() {
  this.dataSource.filter = this.searchInput.trim().toLowerCase();
}

export interface CompanyData {
  companyId: string;
  companyName: string;
  companyShortCode: string;
}
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/frontend/src/app/components (qwiklabs-gcp-00-eed44799d6a7) $
```



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End Lab

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Username

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aX2Lo6iD7jmK



Project ID

qwiklabs-gcp-00-eed4479f



## Task 3. Build and deploy the backend component

1. Navigate to the folder containing the code required to build and deploy the backend.

```
cd ../../../../../../backend
```



2. Create the **.env** file. As mentioned earlier, this file contains project specific information so that the application's backend component can communicate with the Cloud Spanner instance.

In the cloud shell enter the following command to invoke the **Nano** text editor and create a new **.env** file.

```
nano .env
```



Paste the code block listed below.

```
REDSHIFT_HOST=redshift-cluster-1.ckjwv.svc.cluster.local  
REDSHIFT_PORT=5439  
REDSHIFT_DB=public  
REDSHIFT_USER=omega_trader  
REDSHIFT_PASSWORD=qw123456  
REDSHIFT_JDBC_CONNECTION_URL=jdbc:redshift://redshift-cluster-1.ckjwv.svc.cluster.local:5439/public
```

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Congratulations!

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```
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/frontend/src/app/components (qwiklabs-gcp-00-eed44799d6a7)$ cd ../../../.backend  
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/backend (qwiklabs-gcp-00-eed44799d6a7)$  
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/backend (qwiklabs-gcp-00-eed44799d6a7)$
```

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Username

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Password

aX2Lo6iD7jmK



Project ID

qwiklabs-gcp-00-eed44799d6a7



In the cloud shell enter the following command to invoke the **Nano** text editor and create a new **.env** file.

nano .env

Paste the code block listed below.

```
PROJECTID = qwiklabs-gcp-00-eed44799d6a7
INSTANCE = omegatrade-instance
DATABASE = omegatrade-db
JWT_KEY = w54p3Y?4dj%8Xqa2jjVC84narhe5Pk
EXPIRE_IN = 30d
```

Press **Ctrl+X** to exit Nano, **Y** to confirm the update, and press **Enter** to save your changes.

3. Before you proceed further you must install updated components for **npm** so that the backend can be properly compiled. **npm** is a package manager for JavaScript. **npm** is the default package manager for the JavaScript runtime environment Node.js.

Task 1. Enable required Google Cloud APIs

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Congratulations!

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CLOUD SHELL Terminal (qwiklabs-gcp-00-eed44799d6a7) + Open Editor

```
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/frontend/src/app/components (qwiklabs-gcp-00-eed44799d6a7)$ cd ../../../.backend  
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/backend (qwiklabs-gcp-00-eed44799d6a7)$  
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/backend (qwiklabs-gcp-00-eed44799d6a7)$ nano .env
```

9+ 10°C Clear

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Dashboard – qwiklabs-gcp-00-eed44799d6a7 x +

https://console.cloud.google.com/home/dashboard?project=qwiklabs-gcp-00-eed44799d6a7&pli=1&cloudshell=true

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CLOUD SHELL

GNU nano 7.2 .env \*

```
PROJECTID = qwiklabs-gcp-00-eed44799d6a7
INSTANCE = omegatrade-instance
DATABASE = omegatrade-db
JWT_KEY = w54p3Y?4dj%8Xqa2jjVC84narhe5Pk
EXPIRE_IN = 30d
```

^G Help ^O Write Out ^W Where Is ^K Cut ^T Execute ^C Location M-U Undo M-A Set Mark M-] To Bracket  
^X Exit ^R Read File ^\ Replace ^U Paste ^J Justify ^/ Go To Line M-E Redo M-6 Copy ^Q Where Was

9+ 10°C Clear

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? Time limit

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Username

student-00-1fb52fc512f00



Password

aX2Lo6iD7jmK



Project ID

qwiklabs-gcp-00-eed44799



3. Before you proceed further you must install updated components for **npm** so that the backend can be properly compiled. **npm** is a package manager for JavaScript. **npm** is the default package manager for the JavaScript runtime environment Node.js.

```
nvm install 22.6
```

```
npm install npm -g  
npm install --loglevel=error
```

4. Next build the backend application using a reference dockerfile that exists in the repository folder.

```
docker build -t gcr.io/qwiklabs-gcp-00-eed44799d6a7/omega-trade/bac
```

**Note:** You may safely ignore any **npm notice...** messages that appear during the build process

Task 1. Enable required Google Cloud APIs 0/100

Task 2. Download and inspect the application code

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Congratulations!

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```
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/backend (qwiklabs-gcp-00-eed44799d6a7)$ nvm install 22.6
Downloading and installing node v22.6.0...
Downloading https://nodejs.org/dist/v22.6.0/node-v22.6.0-linux-x64.tar.xz...
#####
Computing checksum with sha256sum
Checksums matched!
Now using node v22.6.0 (npm v10.8.2)
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/backend (qwiklabs-gcp-00-eed44799d6a7)$
```

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```
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/backend (qwiklabs-gcp-00-eed44799d6a7)$ nvm install 22.6
Downloading and installing node v22.6.0...
Downloading https://nodejs.org/dist/v22.6.0/node-v22.6.0-linux-x64.tar.xz...
#####
Computing checksum with sha256sum
Checksums matched!
Now using node v22.6.0 (npm v10.8.2)
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/backend (qwiklabs-gcp-00-eed44799d6a7)$ npm install npm -g
npm install --loglevel=error

removed 14 packages, and changed 100 packages in 4s

25 packages are looking for funding
  run `npm fund` for details

added 308 packages, and audited 309 packages in 22s

19 packages are looking for funding
  run `npm fund` for details

34 vulnerabilities (4 low, 9 moderate, 19 high, 2 critical)

To address issues that do not require attention, run:
  npm audit fix

To address all issues (including breaking changes), run:
  npm audit fix --force

Run `npm audit` for details.
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/backend (qwiklabs-gcp-00-eed44799d6a7)$
```

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CLOUD SHELL Terminal (qwiklabs-gcp-00-eed44799d6a7) + Open Editor

```
* @param row contains company object
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/backend (qwiklabs-gcp-00-eed44799d6a7)$ docker build -t gcr.io/qwiklabs-gcp-00-eed44799d6a7/omega-trade/backend:v1 -f dockerfile.prod .
[+] Building 61.0s (13/13) FINISHED
      docker:default
      dockerfile.prod
      => [internal] load build definition from dockerfile.prod
      => => transferring dockerfile: 295B
      => [internal] load metadata for docker.io/library/node:18
      => [internal] load .dockerignore
      => => transferring context: 2B
      => [1/8] FROM docker.io/library/node:18@sha256:c6ae79e38498325db67193d391e6ec1d224d96c693a8a4d943498556716d3783
      => => resolve docker.io/library/node:18@sha256:c6ae79e38498325db67193d391e6ec1d224d96c693a8a4d943498556716d3783
      => => sha256:461077a72fb7fe40d34a37d6a1958c4d16772d0dd77f572ec50a1fdc41a3754d 446B / 446B
      => => sha256:3697be50c98b9d071df4637e1d3491d00e7b9f3a732768c876d82309b3c5a145 1.25MB / 1.25MB
      => => sha256:c6b30c3f16966552af10ac00521f60355b1fcfd46ac1c20b1038587e28583ce7 45.68MB / 45.68MB
      => => sha256:cda7f44f2bddcc4bb7514474024b3f3705de00ddb6355a33be5ac7808e5b7125 3.32kB / 3.32kB
      => => sha256:79b2f47ad4443652b9b5cc81a95ede249fd976310efdbee159f29638783778c0 64.40MB / 64.40MB
      => => sha256:e23f099911d692f62b851cf49a1e93294288a115f5cd2d014180e4d3684d34ab 211.36MB / 211.36MB
      => => sha256:37927ed901b1b2608b72796c6881bf645480268eca4ac9a37b9219e050bb4d84 24.02MB / 24.02MB
      => => sha256:3e6b9d1a95114e19f12262a4e8a59ad1d1a10ca7b82108adcf0605a200294964 48.49MB / 48.49MB
      => => extracting sha256:3e6b9d1a95114e19f12262a4e8a59ad1d1a10ca7b82108adcf0605a200294964
      => => extracting sha256:37927ed901b1b2608b72796c6881bf645480268eca4ac9a37b9219e050bb4d84
      => => extracting sha256:79b2f47ad4443652b9b5cc81a95ede249fd976310efdbee159f29638783778c0
      => => extracting sha256:e23f099911d692f62b851cf49a1e93294288a115f5cd2d014180e4d3684d34ab
      => => extracting sha256:cda7f44f2bddcc4bb7514474024b3f3705de00ddb6355a33be5ac7808e5b7125
      => => extracting sha256:c6b30c3f16966552af10ac00521f60355b1fcfd46ac1c20b1038587e28583ce7
      => => extracting sha256:3697be50c98b9d071df4637e1d3491d00e7b9f3a732768c876d82309b3c5a145
      => => extracting sha256:461077a72fb7fe40d34a37d6a1958c4d16772d0dd77f572ec50a1fdc41a3754d
      => [internal] load build context
      => => transferring context: 40.74MB
      => [2/8] WORKDIR /usr/src/app
      => [3/8] COPY package*.json ./
```

9+ 10°C Clear

Search

9:24 PM 09-01-2026 ENG IN

```
Terminal (qwiklabs-gcp-00-eed44799d6a7) x + Open Editor
=> => sha256:cda7f44f2bddcc4bb7514474024b3f3705de00ddb6355a33be5ac7808e5b7125 3.32kB / 3.32kB 0.1s
=> => sha256:79b2f47ad4443652b9b5cc81a95ede249fd976310efdbee159f29638783778c0 64.40MB / 64.40MB 4.2s
=> => sha256:e23f099911d692f62b851cf49a1e93294288a115f5cd2d014180e4d3684d34ab 211.36MB / 211.36MB 8.0s
=> => sha256:37927ed901b1b2608b72796c6881bf645480268eca4ac9a37b9219e050bb4d84 24.02MB / 24.02MB 2.6s
=> => sha256:3e6b9d1a95114e19f12262a4e8a59ad1d1a10ca7b82108adcf0605a200294964 48.49MB / 48.49MB 1.7s
=> => extracting sha256:3e6b9d1a95114e19f12262a4e8a59ad1d1a10ca7b82108adcf0605a200294964 3.6s
=> => extracting sha256:37927ed901b1b2608b72796c6881bf645480268eca4ac9a37b9219e050bb4d84 0.9s
=> => extracting sha256:79b2f47ad4443652b9b5cc81a95ede249fd976310efdbee159f29638783778c0 3.2s
=> => extracting sha256:e23f099911d692f62b851cf49a1e93294288a115f5cd2d014180e4d3684d34ab 8.4s
=> => extracting sha256:cda7f44f2bddcc4bb7514474024b3f3705de00ddb6355a33be5ac7808e5b7125 0.0s
=> => extracting sha256:c6b30c3f16966552af10ac00521f60355b1fcfd46ac1c20b1038587e28583ce7 2.6s
=> => extracting sha256:3697be50c98b9d071df4637e1d3491d00e7b9f3a732768c876d82309b3c5a145 0.1s
=> => extracting sha256:461077a72fb7fe40d34a37d6a1958c4d16772d0dd77f572ec50a1fdc41a3754d 0.0s
=> [internal] load build context 3.7s
=> => transferring context: 40.74MB 3.6s
=> [2/8] WORKDIR /usr/src/app 2.8s
=> [3/8] COPY package*.json ./ 0.1s
=> [4/8] RUN mkdir logs && chmod 777 logs 0.4s
=> [5/8] RUN npm install npm -g --loglevel=error 10.1s
=> [6/8] RUN npm cache clean --force --loglevel=error 0.9s
=> [7/8] RUN npm install --loglevel=error 8.3s
=> [8/8] COPY . ./ 1.6s
=> exporting to image 11.1s
=> => exporting layers 6.0s
=> => exporting manifest sha256:9e2ed37d45e6262f8fe89a3d1c935928403fac05efe16c3da85b6c343218ea21 0.0s
=> => exporting config sha256:6f6802036c8f601b050f88999345d167bc3bc30e625afa6be7c8e8acb2945314 0.0s
=> => exporting attestation manifest sha256:2a229656c7dbbad13a7257fd6c7e1dc847e188b45f388f47eb776fc375d9b16c 0.0s
=> => exporting manifest list sha256:731ef217dea8e37876cf625d17864f5b2dc8bbf3ee8181be765d01e413af2282 0.0s
=> => naming to gcr.io/qwiklabs-gcp-00-eed44799d6a7/omega-trade/backend:v1 0.0s
=> => unpacking to gcr.io/qwiklabs-gcp-00-eed44799d6a7/omega-trade/backend:v1 4.9s
```



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? Time limit

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Username

student-00-1fb52fc512f00



Password

aX2Lo6iD7jmK



Project ID

qwiklabs-gcp-00-eed4479f



**Note:** You may safely ignore any **npm notice...** messages that appear during the build process

5. Prior to pushing the new application package, run the following command to set configuration permissions in the Cloud Shell.

Enter 'y' when prompted if you want to continue.

```
gcloud auth configure-docker
```

6. Push the newly created application package to the Artifact Registry for your Qwiklabs project.

```
docker push gcr.io/qwiklabs-gcp-00-eed44799d6a7/omega-trade/backend
```

7. Finally deploy the backend application using Cloud Run. Cloud Run is a serverless deployment framework which abstracts away infrastructure management and scales up or down automatically almost instantaneously depending on traffic.

Task 1. Enable required Google Cloud APIs  
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Task 2. Download and inspect the application code

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Task 6. Perform operations in the OmegaTrade Application

Congratulations!

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```
=> => sha256:cda7f44f2bddcc4bb7514474024b3f3705de00ddb6355a33be5ac7808e5b7125 3.32kB / 3.32kB 0.1s
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/backend (qwiklabs-gcp-00-eed44799d6a7)$ gcloud auth configure-docker
WARNING: Your config file at [/home/student_00_1fb52fc512f0/.docker/config.json] contains these credential helper entries:

{
  "credHelpers": {
    "gcr.io": "gcloud",
    "us.gcr.io": "gcloud",
    "eu.gcr.io": "gcloud",
    "asia.gcr.io": "gcloud",
    "staging-k8s.gcr.io": "gcloud",
    "marketplace.gcr.io": "gcloud",
    "africa-south1-docker.pkg.dev": "gcloud",
    "docker.africa-south1.rep.pkg.dev": "gcloud",
    "asia-docker.pkg.dev": "gcloud",
    "asia-east1-docker.pkg.dev": "gcloud",
    "docker.asia-east1.rep.pkg.dev": "gcloud",
    "asia-east2-docker.pkg.dev": "gcloud",
    "docker.asia-east2.rep.pkg.dev": "gcloud",
    "asia-northeast1-docker.pkg.dev": "gcloud",
    "docker.asia-northeast1.rep.pkg.dev": "gcloud",
    "asia-northeast2-docker.pkg.dev": "gcloud",
    "docker.asia-northeast2.rep.pkg.dev": "gcloud",
    "asia-northeast3-docker.pkg.dev": "gcloud",
    "docker.asia-northeast3.rep.pkg.dev": "gcloud",
    "asia-south1-docker.pkg.dev": "gcloud",
    "docker.asia-south1.rep.pkg.dev": "gcloud",
    "asia-south2-docker.pkg.dev": "gcloud",
    "docker.asia-south2.rep.pkg.dev": "gcloud",
    "asia-southeast1-docker.pkg.dev": "gcloud",
```

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```
"us-docker.pkg.dev": "gcloud",
"us-central1-docker.pkg.dev": "gcloud",
"docker.us-central1.rep.pkg.dev": "gcloud",
"us-central2-docker.pkg.dev": "gcloud",
"docker.us-central2.rep.pkg.dev": "gcloud",
"us-east1-docker.pkg.dev": "gcloud",
"docker.us-east1.rep.pkg.dev": "gcloud",
"us-east4-docker.pkg.dev": "gcloud",
"docker.us-east4.rep.pkg.dev": "gcloud",
"us-east5-docker.pkg.dev": "gcloud",
"docker.us-east5.rep.pkg.dev": "gcloud",
"us-east7-docker.pkg.dev": "gcloud",
"docker.us-east7.rep.pkg.dev": "gcloud",
"us-south1-docker.pkg.dev": "gcloud",
"docker.us-south1.rep.pkg.dev": "gcloud",
"us-west1-docker.pkg.dev": "gcloud",
"docker.us-west1.rep.pkg.dev": "gcloud",
"us-west2-docker.pkg.dev": "gcloud",
"docker.us-west2.rep.pkg.dev": "gcloud",
"us-west3-docker.pkg.dev": "gcloud",
"docker.us-west3.rep.pkg.dev": "gcloud",
"us-west4-docker.pkg.dev": "gcloud",
"docker.us-west4.rep.pkg.dev": "gcloud",
"us-west8-docker.pkg.dev": "gcloud"
}
}
Adding credentials for all GCR repositories.
WARNING: A long list of credential helpers may cause delays running 'docker build'. We recommend passing the registry name to configure only the registry you are using.
gcloud credential helpers already registered correctly.
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/backend (qwiklabs-gcp-00-eed44799d6a7)$
```

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```
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/backend (qwiklabs-gcp-00-eed44799d6a7)$ docker push gcr.io/qwiklabs-gcp-00-eed44799d6a7/omega-trade/backend:v1
The push refers to repository [gcr.io/qwiklabs-gcp-00-eed44799d6a7/omega-trade/backend]
3697be50c98b: Layer already exists
f177641c9d4b: Pushed
0ec255619b0c: Pushed
553a034a38af: Pushed
37927ed901b1: Layer already exists
c6b30c3f1696: Layer already exists
461077a72fb7: Layer already exists
575d9354a4b6: Pushed
1ed8423ca5e5: Pushed
955d0ab172ef: Pushed
e23f099911d6: Layer already exists
4b4ed660532e: Pushed
4f767b614119: Pushed
3e6b9d1a9511: Layer already exists
79b2f47ad444: Layer already exists
cda7f44f2bdd: Layer already exists
v1: digest: sha256:731ef217dea8e37876cf625d17864f5b2dc8bbf3ee8181be765d01e413af2282 size: 856
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/backend (qwiklabs-gcp-00-eed44799d6a7)$
```

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[Learn more.](#)

[Open Google Cloud console](#)

Username

student-00-1fb52fc512f00

Password

aX2Lo6iD7jmK

Project ID

qwiklabs-gcp-00-eed4479f

```
docker push gcr.io/qwiklabs-gcp-00-eed44799d6a7/omegarate-trade/backend
```

7. Finally deploy the backend application using Cloud Run. Cloud Run is a serverless deployment framework which abstracts away infrastructure management and scales up or down automatically almost instantaneously depending on traffic.

```
gcloud run deploy omegatrade-backend --platform managed --region eu
```

8. Copy the URL provided at the end of the deployment. Preserve the URL in notepad, a text file, or other readily accessible location. This URL will be supplied to the frontend application to ensure the user interface can properly communicate with the Cloud Spanner database via the backend.

The backend Service URL will appear in the following format:

```
https://omegarate-backend-zzzzzzzz1x-uw.a.run.app
```

Task 1. Enable required Google Cloud APIs

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```
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/backend (qwiklabs-gcp-00-eed44799d6a7)$ gcloud run deploy omega trade-backend --platform managed --region europe-west4 --image gcr.io/qwiklabs-gcp-00-eed44799d6a7/omega-trade/backend:v1 --memory 512Mi --allow-unauthenticated
Deploying container to Cloud Run service [omegatrade-backend] in project [qwiklabs-gcp-00-eed44799d6a7] region [europe-west4]
Deploying new service...
Setting IAM Policy...done
Creating Revision...done
Routing traffic...done
Done.
Service [omegatrade-backend] revision [omegatrade-backend-00001-nj4] has been deployed and is serving 100 percent of traffic.
Service URL: https://omegatrade-backend-109287812022.europe-west4.run.app
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/backend (qwiklabs-gcp-00-eed44799d6a7)$
```

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End Lab

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Password

aX2Lo6iD7jmK



Project ID

qwiklabs-gcp-00-eed4479f



## Task 4. Import sample stock trade data to the database

1. To import sample company and stock data, run the following command in the current (main backend) folder.

```
unset SPANNER_EMULATOR_HOST  
node seed-data.js
```

2. You will receive confirmation that the tables were loaded successfully.

```
Inserting Companies...  
done  
Inserting Simulations...  
done  
Inserting Stocks...  
done  
Data Loaded successfully
```

3. Click [Check my progress](#) to verify the objective.

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Task 1. Enable required Google Cloud APIs 0/100

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```
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/backend (qwiklabs-gcp-00-eed44799d6a7)$ unset SPANNER_EMULATOR_HOST
node seed-data.js
(node:2202) [DEP0040] DeprecationWarning: The `punycode` module is deprecated. Please use a userland alternative instead.
(Use `node --trace-deprecation ...` to show where the warning was created)
Inserting Companies...
done
Inserting Simulations...
done
Inserting Stocks...
done
Data Loaded successfully
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/backend (qwiklabs-gcp-00-eed44799d6a7)$
```

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## Task 5. Build and deploy the frontend component

1. Navigate to the directory containing the frontend code. Specifically navigate to the environments folder to update the configuration file to point to your backend component.

```
cd ../../frontend/src/environments
```



2. In the cloud shell enter the following command to invoke the **Nano** text editor and open the **environment.ts** file.

```
nano environment.ts
```



3. Carefully delete the string **http://localhost:3000** and replace it with your backend URL.

**Note:** Be certain to retain the **/api/v1/** portion of the URL

100/100

Task 1. Enable required Google Cloud APIs

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```
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/backend (qwiklabs-gcp-00-eed44799d6a7)$ cd ../frontend/src/environments
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/frontend/src/environments (qwiklabs-gcp-00-eed44799d6a7)$
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/frontend/src/environments (qwiklabs-gcp-00-eed44799d6a7)$ nano environment.ts
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/frontend/src/environments (qwiklabs-gcp-00-eed44799d6a7)$ nano environment.ts
```

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GNU nano 7.2 environment.ts

```
export const environment = {  
  production: false,  
  name: "dev",  
  // change baseUrl according to backend URL  
  baseUrl: "http://localhost:3000/api/v1/",  
  // change clientId to actual value you have received from Oauth console  
  clientId: ""  
};
```

[ Read 8 lines ]

^G Help ^O Write Out ^W Where Is ^K Cut ^T Execute ^C Location M-U Undo M-A Set Mark M-] To Bracket  
^X Exit ^R Read File ^\ Replace ^U Paste ^J Justify ^/ Go To Line M-E Redo M-6 Copy ^Q Where Was

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```
GNU nano 7.2 environment.ts *
export const environment = {
  production: false,
  name: "dev",
  // change baseUrl according to backend URL
  baseUrl:"https://omegatrade-backend-109287812022.europe-west4.run.app/api/v1/",
  // change clientId to actual value you have received from Oauth console
  clientId: ""
};
```

^G Help ^O Write Out ^W Where Is ^K Cut ^T Execute ^C Location M-U Undo M-A Set Mark M-] To Bracket  
^X Exit ^R Read File ^\ Replace ^U Paste ^J Justify ^/ Go To Line M-E Redo M-6 Copy ^Q Where Was

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Username

student-00-1fb52fc512f00



Password

aX2Lo6iD7jmK



Project ID

qwiklabs-gcp-00-eed4479d6a7



5. Install updated components for **npm** so that the frontend can be properly compiled.

```
npm install npm -g  
npm install --loglevel=error
```

**Note:** You may safely ignore any **npm WARN config...** messages that appear during the installation process

6. Next build the frontend application using a reference dockerfile that exists in the repository folder. The frontend build may take 5 to 10 minutes to complete.

```
docker build -t gcr.io/qwiklabs-gcp-00-eed4479d6a7/omegatrade/fror
```

**Note:** You may safely ignore any **npm notice...** messages that appear during the build process

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```
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student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/frontend/src/environments (qwiklabs-gcp-00-eed44799d6a7)$ nano environment.ts
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/frontend/src/environments (qwiklabs-gcp-00-eed44799d6a7)$ nano environment.ts
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/frontend/src/environments (qwiklabs-gcp-00-eed44799d6a7)$ cd ..
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/frontend (qwiklabs-gcp-00-eed44799d6a7)$
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/frontend (qwiklabs-gcp-00-eed44799d6a7)$ npm install npm --global
npm install --loglevel=error

changed 16 packages in 3s

25 packages are looking for funding
  run `npm fund` for details

added 1484 packages, and audited 1485 packages in 2m

90 packages are looking for funding
  run `npm fund` for details

155 vulnerabilities (12 low, 61 moderate, 66 high, 16 critical)

To address issues that do not require attention, run:
  npm audit fix

To address all issues (including breaking changes), run:
  npm audit fix --force

Run `npm audit` for details.
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/frontend (qwiklabs-gcp-00-eed44799d6a7)$
```

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```
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/frontend/src/environments (qwiklabs-gcp-00-eed44799d6a7)$ student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/frontend (qwiklabs-gcp-00-eed44799d6a7)$ docker build -t gcr.io/qwiklabs-gcp-00-eed44799d6a7/omegatrade/frontend:v1 -f dockerfile .
[+] Building 349.4s (13/13) FINISHED
  => [internal] load build definition from dockerfile
  => => transferring dockerfile: 293B
  => [internal] load metadata for docker.io/library/node:16.15
  => [internal] load .dockerignore
  => => transferring context: 2B
  => [1/8] FROM docker.io/library/node:16.15@sha256:a13d2d2aec7f0dae18a52ca4d38b592e45a45cc4456ffab82e5ff10d8a53d042
  => => resolve docker.io/library/node:16.15@sha256:a13d2d2aec7f0dae18a52ca4d38b592e45a45cc4456ffab82e5ff10d8a53d042
  => => sha256:06925feb028d4b08eea960947c23f71f7d04d52f225409679e892b4210a94583 32.51MB / 34.07MB
  => => sha256:8aa2a751e29b1739c8691ac780a19e150f5a8a813ea4878083719fbefbd4379b2 451B / 451B
  => => sha256:403a3da90881d4f424b4e823a744296c4b272645716bf1094ef265b77cc791c6 2.29MB / 2.29MB
  => => sha256:43ccf1ebdd00dc1f1037d0133dfa1fd3fc1bab3eea49571882896bda59dbb892 4.20kB / 4.20kB
  => => sha256:4e42533e7311ad0a85fe19e9bc5fe3138f608853eeaaea70ee08b2a631b356c3 51.84MB / 51.84MB
  => => sha256:293ff1be7001d642a624409e2d5f90e7708ef7e6f1a75f4eb7362a9296e18d20 10.00MB / 10.00MB
  => => sha256:e56e70ed0dfb39711bca67c13b10e546d3d79ce4a6b0fa528c1d1bbfc5b9d02d 192.49MB / 192.49MB
  => => sha256:8a014c92148934973210d840dc7cfed53e0afba38d839afaa48ed5150eae19af 7.86MB / 7.86MB
  => => sha256:ea267e4631a981caf2841a7e9a1faf29cef9d020c4378fc64845802d17586531 50.44MB / 50.44MB
  => => extracting sha256:ea267e4631a981caf2841a7e9a1faf29cef9d020c4378fc64845802d17586531
  => => extracting sha256:8a014c92148934973210d840dc7cfed53e0afba38d839afaa48ed5150eae19af
  => => extracting sha256:293ff1be7001d642a624409e2d5f90e7708ef7e6f1a75f4eb7362a9296e18d20
  => => extracting sha256:4e42533e7311ad0a85fe19e9bc5fe3138f608853eeaaea70ee08b2a631b356c3
  => => extracting sha256:e56e70ed0dfb39711bca67c13b10e546d3d79ce4a6b0fa528c1d1bbfc5b9d02d
  => => extracting sha256:43ccf1ebdd00dc1f1037d0133dfa1fd3fc1bab3eea49571882896bda59dbb892
  => => extracting sha256:06925feb028d4b08eea960947c23f71f7d04d52f225409679e892b4210a94583
  => => extracting sha256:403a3da90881d4f424b4e823a744296c4b272645716bf1094ef265b77cc791c6
  => => extracting sha256:8aa2a751e29b1739c8691ac780a19e150f5a8a813ea4878083719fbefbd4379b2
  => [internal] load build context
  => => transferring context: 447.15MB
```

9+ 10°C Clear

Search

09:40 PM 09-01-2026 ENG IN

Dashboard – qwiklabs-gcp-00-eed44799d6a7 Error

https://console.cloud.google.com/home/dashboard?project=qwiklabs-gcp-00-eed44799d6a7&pli=1&cloudshell=true

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Google Cloud Terminal (qwiklabs-gcp-00-eed44799d6a7) +

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```
=> => sha256:293ff1be7001d642a624409e2d5f90e7708ef7e6f1a75f4eb7362a9296e18d20 10.00MB / 10.00MB 0.9s
=> => sha256:e56e70ed0dfb39711bca67c13b10e546d3d79ce4a6b0fa528c1d1bbfc5b9d02d 192.49MB / 192.49MB 10.8s
=> => sha256:8a014c92148934973210d840dc7cfed53e0afba38d839afaa48ed5150eae19af 7.86MB / 7.86MB 0.8s
=> => sha256:ea267e4631a981caf2841a7e9a1faf29cef9d020c4378fc64845802d17586531 50.44MB / 50.44MB 2.7s
=> => extracting sha256:ea267e4631a981caf2841a7e9a1faf29cef9d020c4378fc64845802d17586531 7.6s
=> => extracting sha256:8a014c92148934973210d840dc7cfed53e0afba38d839afaa48ed5150eae19af 0.9s
=> => extracting sha256:293ff1be7001d642a624409e2d5f90e7708ef7e6f1a75f4eb7362a9296e18d20 1.1s
=> => extracting sha256:4e42533e7311ad0a85fe19e9bc5fe3138f608853eeaaea70ee08b2a631b356c3 6.7s
=> => extracting sha256:e56e70ed0dfb39711bca67c13b10e546d3d79ce4a6b0fa528c1d1bbfc5b9d02d 16.3s
=> => extracting sha256:43ccf1ebdd00dc1f1037d0133dfa1fd3fc1bab3eea49571882896bda59dbb892 1.2s
=> => extracting sha256:06925feb028d4b08eea960947c23f71f7d04d52f225409679e892b4210a94583 1.9s
=> => extracting sha256:403a3da90881d4f424b4e823a744296c4b272645716bf1094ef265b77cc791c6 0.1s
=> => extracting sha256:8aa2a751e29b1739c8691ac780a19e150f5a8a813ea4878083719fbabd4379b2 0.0s
=> [internal] load build context 33.0s
=> => transferring context: 447.15MB 32.7s
=> [2/8] WORKDIR /usr/src/app 1.4s
=> [3/8] COPY package*.json ./ 0.4s
=> [4/8] RUN npm install -g @angular/cli --loglevel=error 22.1s
=> [5/8] RUN npm cache clean --force --loglevel=error 1.4s
=> [6/8] RUN npm install --loglevel=error 70.0s
=> [7/8] COPY . ./ 14.5s
=> [8/8] RUN npm run build 86.9s
=> exporting to image 109.5s
=> => exporting layers 68.3s
=> => exporting manifest sha256:2a8f20976f8a6e7c1f87de62a9e833387e4967d5f00e75c4a3f3e0615ab6fc91 0.0s
=> => exporting config sha256:2f290bb0aadd2b5734a530390f755f8ec8e2ce5371a6394fc80fa79363f84ddc 0.0s
=> => exporting attestation manifest sha256:ebc1cf45c2be9fb0d45ae8ede2b56d96d43d288a390d65aa40f29344a6a925d 0.0s
=> => exporting manifest list sha256:74cc472b018d01f07675139635c851a221ff4d11df6dfe52228bbcd920a7f9e2 0.0s
=> => naming to gcr.io/qwiklabs-gcp-00-eed44799d6a7/omegatrade/frontend:v1 0.0s
=> => unpacking to gcr.io/qwiklabs-gcp-00-eed44799d6a7/omegatrade/frontend:v1 41.0s
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/frontend (qwiklabs-gcp-00-eed44799d6a7) $
```

9+ 10°C Clear

Search

Eng IN

09:40 PM 09-01-2026



Dashboard – qwiklabs-gcp-00-eed44799d6a7 Error

https://console.cloud.google.com/home/dashboard?project=qwiklabs-gcp-00-eed44799d6a7&pli=1&cloudshell=true

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Google Cloud Terminal (qwiklabs-gcp-00-eed44799d6a7) +

CLOUD SHELL

Search (/) for resources, docs, products, and more

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student\_00\_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/frontend (qwiklabs-gcp-00-eed44799d6a7)\$ docker push gcr.io/qwiklabs-gcp-00-eed44799d6a7/omegatrade/frontend:v1  
The push refers to repository [gcr.io/qwiklabs-gcp-00-eed44799d6a7/omegatrade/frontend]  
4e42533e7311: Layer already exists  
06925feb028d: Layer already exists  
403a3da90881: Layer already exists  
2c02a9e3e77b: Pushed  
b72776141789: Pushed  
293ff1be7001: Layer already exists  
e56e70ed0dfb: Layer already exists  
43ccf1ebdd00: Layer already exists  
419915809b56: Pushed  
8a014c921489: Layer already exists  
8aa2a751e29b: Layer already exists  
5e8462ae6adf: Pushed  
ec6b348d3cc2: Pushed  
0209201a8eed: Pushed  
f5a361bdf70c: Pushed  
41a8d9aa938b: Pushed  
ea267e4631a9: Layer already exists  
v1: digest: sha256:74cc472b018d01f07675139635c851a221ff4d11df6dfe52228bbcd920a7f9e2 size: 856  
student\_00\_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/frontend (qwiklabs-gcp-00-eed44799d6a7)\$

9+ 10°C Clear

Search

9:42 PM 09-01-2026

Dashboard – qwiklabs-gcp-00-eed44799d6a7 x Error OmegaTrade +

https://console.cloud.google.com/home/dashboard?project=qwiklabs-gcp-00-eed44799d6a7&pli=1&cloudshell=true

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Google Cloud qwiklabs-gcp-00-eed44799d6a7 Search (/) for resources, docs, products, and more Search

CLOUD SHELL Terminal (qwiklabs-gcp-00-eed44799d6a7) + Open Editor

```
klabs-gcp-00-eed44799d6a7/omegatrade/frontend:v1
The push refers to repository [gcr.io/qwiklabs-gcp-00-eed44799d6a7/omegatrade/frontend]
4e42533e7311: Layer already exists
06925feb028d: Layer already exists
403a3da90881: Layer already exists
2c02a9e3e77b: Pushed
b72776141789: Pushed
293ff1be7001: Layer already exists
e56e70ed0dfb: Layer already exists
43ccf1ebdd00: Layer already exists
419915809b56: Pushed
8a014c921489: Layer already exists
8aa2a751e29b: Layer already exists
5e8462ae6adf: Pushed
ec6b348d3cc2: Pushed
0209201a8eed: Pushed
f5a361bdf70c: Pushed
41a8d9aa938b: Pushed
ea267e4631a9: Layer already exists
v1: digest: sha256:74cc472b018d01f07675139635c851a221ff4d11df6dfe52228bbcd920a7f9e2 size: 856
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/frontend (qwiklabs-gcp-00-eed44799d6a7)$ gcloud run deploy ome
atrade-frontend --platform managed --region europe-west4 --image gcr.io/qwiklabs-gcp-00-eed44799d6a7/omegatrade/frontend:v1 --allow-unauthenticated
Deploying container to Cloud Run service [omegatrade-frontend] in project [qwiklabs-gcp-00-eed44799d6a7] region [europe-west4]
Deploying new service...
Setting IAM Policy...done
Creating Revision...done
Routing traffic...done
Done.
Service [omegatrade-frontend] revision [omegatrade-frontend-00001-8mz] has been deployed and is serving 100 percent of traffic.
Service URL: https://omegatrade-frontend-109287812022.europe-west4.run.app
student_00_1fb52fc512f0@cloudshell:~/training-data-analyst/courses/cloud-spanner/omegatrade/frontend (qwiklabs-gcp-00-eed44799d6a7)$
```

9+ 10°C Clear Search

ENG IN 09:44 PM 09-01-2026



https://omegatrade-frontend-109287812022.europe-west4.run.app/#/



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GCP-LAB

Hydra

datawarehouse

Products

# Sign in

Business email

Password

**Sign in**

[sign up](#)



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Deploy a Modern Web App connected to a Cloud

Lab setup instructions and requirements

01:39:15

End Lab

?

Time limit

Caution: When you are in the console, do not deviate from the lab instructions. Doing so may cause your account to be blocked.

[Learn more.](#)[Open Google Cloud console](#)

Username

student-00-1fb52fc512f00



Password

aX2Lo6iD7jmK



Project ID

qwiklabs-gcp-00-eed4479



## Task 6. Perform operations in the OmegaTrade Application

1. On the application launch page click the **sign up** link.
2. Use the following details to create a new account for a fictitious company named **Spanner1**.

| Item                  | Value              |
|-----------------------|--------------------|
| Business email        | admin@spanner1.com |
| Full Name             | Spanner1 Admin     |
| Password              | Spanner1           |
| Confirm your Password | Spanner1           |

3. Your account will be created and you will be logged in.

100/100  
Task 1. Enable required Google Cloud APIs

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Task 5. Build and deploy the frontend component

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Congratulations!

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01:37:24

End Lab

Time limit

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[Learn more.](#)

Open Google Cloud console

Username

student-00-1fb52fc512f00



Password

aX2Lo6iD7jmK



Project ID

qwiklabs-gcp-00-eed4479f



3. Your account will be created and you will be logged in.
4. To examine the OmegaTrade application, navigate to the **Dashboard** and choose **Foobar Inc** from the selector to see the stock performance chart for Foobar Inc. You will see a range of simulated stock prices over time for Foobar Inc.
5. Navigate to **Manage Company** and add **Spanner1** as a new company.
6. Click **Add Company** on the right side of the page. On the pop-up window, input the following values:

| Item         | Value    |
|--------------|----------|
| Company Name | Spanner1 |
| Short Code   | SPN      |

Then click **Save**.

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Next



Dashboard – qwiklabs-gcp-00-eed... Error

OmegaTrade

https://omegatrade-frontend-109287812022.europe-west4.run.app/#/companies

Free AI Paraphrasin... Transcript of Case St... GCP-LAB Hydra datawarehouse Products

Omega Trade

Dashboard

Manage Company

Manage Simulations

Company List

Search

Add Company

| Company Name    | Short Code | Action |
|-----------------|------------|--------|
| Baz Ltd         | RΔ7        |        |
| Foo Enterprises |            |        |
| Foobar Inc      |            |        |
| Acme Corp       |            |        |
| Bar Industries  |            |        |

Add Company

Spanner1

SPN

Cancel Save

Items per page: 10 1 - 5 of 5

< < > >>

A modal dialog box titled "Add Company" is open in the center of the screen. It contains two input fields: the first field has "Spanner1" typed into it, and the second field has "SPN" typed into it. Below the fields are two buttons: "Cancel" and "Save". The background of the page is dimmed, and the company list table is partially visible.

Dashboard – qwiklabs-gcp-00-eed... | Error | OmegaTrade | +

https://omegatrade-frontend-109287812022.europe-west4.run.app/#/companies

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Omega Trade

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Company List

Search

Add Company

| Company Name    | Short Code | Action |
|-----------------|------------|--------|
| Spanner1        | SPN        |        |
| Baz Ltd         | BAZ        |        |
| Foo Enterprises | FOO        |        |
| Foobar Inc      | FOB        |        |
| Acme Corp       | ACM        |        |
| Bar Industries  | BAR        |        |

Items per page: 10 | 1 – 6 of 6 | < < > >|

Microsoft Edge

9+ 10°C Clear

Search

09:47 PM 09-01-2026 ENG IN

Dashboard – qwiklabs-gcp-00-eed... | Error

OmegaTrade

https://omegatrade-frontend-109287812022.europe-west4.run.app/#/dashboard

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Omega Trade

Dashboard

Select Spanner1

Simulation is not started for your selected company (**Spanner1**).  
Click [here](#) to create simulation first.

9+ 10°C Clear

Search

09:47 PM 09-01-2026

The screenshot shows a web browser window for the OmegaTrade application. The title bar reads "OmegaTrade". The address bar shows the URL "https://omegatrade-frontend-109287812022.europe-west4.run.app/#/dashboard". The page content includes a sidebar with links for "Dashboard", "Manage Company", and "Manage Simulations". A dropdown menu under "Manage Simulations" is open, showing "Select" and "Spanner1". The main area displays a message: "Simulation is not started for your selected company (**Spanner1**). Click [here](#) to create simulation first." At the bottom of the screen, there is a taskbar with various icons and system status indicators.

Dashboard – qwiklabs-gcp-00-eed... Error OmegaTrade +

https://omegatrade-frontend-109287812022.europe-west4.run.app/#/simulations

Free AI Paraphrasin... Transcript of Case St... GCP-LAB Hydra datawarehouse Products

Omega Trade

Dashboard Manage Company Manage Simulations

### Simulate Data

Select Company: Spanner1 Select Interval: 5 Number of Records: 50

Simulate Start Simulation

### Manage Simulations

Search

| Company Name    | Short Code | Simulation Status | Action |
|-----------------|------------|-------------------|--------|
| Foobar Inc      | FOB        | COMPLETED         |        |
| Bar Industries  | BAR        | COMPLETED         |        |
| Baz Ltd         | BAZ        | COMPLETED         |        |
| Foo Enterprises | FOO        | COMPLETED         |        |
| Acme Corp       | ACM        | COMPLETED         |        |

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9+ 10°C Clear

Search

Windows Taskbar: Search, File Explorer, Edge, Firefox, File Manager, Task View, Taskbar Icons, Network, ENG IN, 09:48 PM, 09-01-2026

Dashboard – qwiklabs-gcp-00-eed... | Error | OmegaTrade | +

https://omegatrade-frontend-109287812022.europe-west4.run.app/#/simulations

Free AI Paraphrasin... Transcript of Case St... GCP-LAB Hydra datawarehouse Products

Omega Trade

Dashboard

Manage Company

Manage Simulations

### Simulate Data

Select Company Select Interval Number of Records Simulate

In seconds

### Manage Simulations

Search

| Company Name    | Short Code | Simulation Status | Action |
|-----------------|------------|-------------------|--------|
| Spanner1        | SPN        | PROCESSING        |        |
| Foobar Inc      | FOB        | COMPLETED         |        |
| Bar Industries  | BAR        | COMPLETED         |        |
| Baz Ltd         | BAZ        | COMPLETED         |        |
| Foo Enterprises | FOO        | COMPLETED         |        |
| Acme Corp       | ACM        | COMPLETED         |        |

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? Time limit

Caution: When you are in the console, do not deviate from the lab instructions. Doing so may cause your account to be blocked.

[Learn more.](#)[Open Google Cloud console](#)

Username

student-00-1fb52fc512f00



Password

aX2Lo6iD7jmK



Project ID

qwiklabs-gcp-00-eed4479f



10. Navigate to the **Dashboard** which will immediately update the chart for **Spanner1** as the simulation progresses. It will take between 3 and 6 minutes for the simulation to complete.

11. The OmegaTrade application also allows you to modify existing company information. On the **Manage Company** tab click the pencil icon under **Action** for **Acme Corp.**

12. Update the company name to **Coyote Inc.** Notice that the **Short Code** cannot be updated in the user interface. Click **Update** to close and accept the change.

13. The update to the company name is immediate. Navigate to the **Dashboard** and you will see that **Acme Corp** no longer appears and **Coyote Inc** has taken its place.

14. Occasionally data changes are required that exceed the capabilities of the application code. As an empowered user you have the ability to update data used in the OmegaTrade application by making direct changes in the Cloud Spanner database.

15. In the Cloud Console, click **Navigation menu (≡)** > **View All Products** > **Databases** > **Spanner**.

Task 1. Enable requ...  
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codeTask 3. Build and deploy  
the backend componentTask 4. Import sample  
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operations in the  
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Congratulations!

100/100

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? Time limit

Caution: When you are in the console, do not deviate from the lab instructions. Doing so may cause your account to be blocked.

[Learn more.](#)[Open Google Cloud console](#)

Username

student-00-1fb52fc512f00



Password

aX2Lo6iD7jmK



Project ID

qwiklabs-gcp-00-eed4479f



15. In the Cloud Console, click **Navigation menu (≡)** > **View All Products** > **Databases** > **Spanner**.
16. Accept any acknowledgement or information window that may appear.
17. Click on the **omegatrade-instance** name and then **omegatrade-db** under **Databases**. From the list of tables on the bottom of the page, click **companies**.
18. Click **Data** on the left side pane to see the table contents.
19. You will update the name of the **Bar Industries** entity.
20. Click on the **checkbox** for the **Bar Industries** row. Then click **Edit** from the choices listed above the table rows.
21. You are taken to the **Spanner Studio**. Click on **+ New tab**. Enter the following query to update the value for **companyName** from **Bar Industries** to **Consolidated Enterprises Inc.**

```
UPDATE
    companies
SET
```

Task 1. Enable required Google Cloud APIs

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Caution: When you are in the console, do not deviate from the lab instructions. Doing so may cause your account to be blocked.

[Learn more.](#)[Open Google Cloud console](#)

Username

student-00-1fb52fc512f00



Password

aX2Lo6iD7jmK



Project ID

qwiklabs-gcp-00-eed4479f

19. You will update the name of the **Bar Industries** entity.20. Click on the **checkbox** for the **Bar Industries** row. Then click **Edit** from the choices listed above the table rows.21. You are taken to the **Spanner Studio**. Click on **+ New tab**. Enter the following query to update the value for **companyName** from **Bar Industries** to **Consolidated Enterprises Inc.**

```
UPDATE
    companies
SET
    companyName='Consolidated Enterprises Inc'
WHERE
    companyName='Bar Industries';
```

**Note:** In the Cloud Spanner query window you have the ability to change the **Short Code** value. The application code as designed does not allow this value to be updated via the user interface.

100/100

Task 1. Enable required Google Cloud APIs

Task 2. Download and inspect the application code

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01:34:08

Time limit

Caution: When you are in the console, do not deviate from the lab instructions. Doing so may cause your account to be blocked.

[Learn more.](#)[Open Google Cloud console](#)

Username

student-00-1fb52fc512f00



Password

aX2Lo6iD7jmK



Project ID

qwiklabs-gcp-00-eed4479f



21. You are taken to the **Spanner Studio**. Click on **+ New tab**. Enter the following query to update the value for **companyName** from **Bar Industries** to **Consolidated Enterprises Inc.**

```
UPDATE
    companies
SET
    companyName='Consolidated Enterprises Inc'
WHERE
    companyName='Bar Industries';
```

**Note:** In the Cloud Spanner query window you have the ability to change the **Short Code** value. The application code as designed does not allow this value to be updated via the user interface.

22. Click **Run** to process the update.

23. Return to the application page, refresh your browser, and navigate to **Dashboard** tab. You will see that **Bar Industries** no longer appears and **Consolidated Enterprises Inc** has taken its place.

Task 1. Enable required Google Cloud APIs

Task 2. Download and inspect the application code

Task 3. Build and deploy the backend component

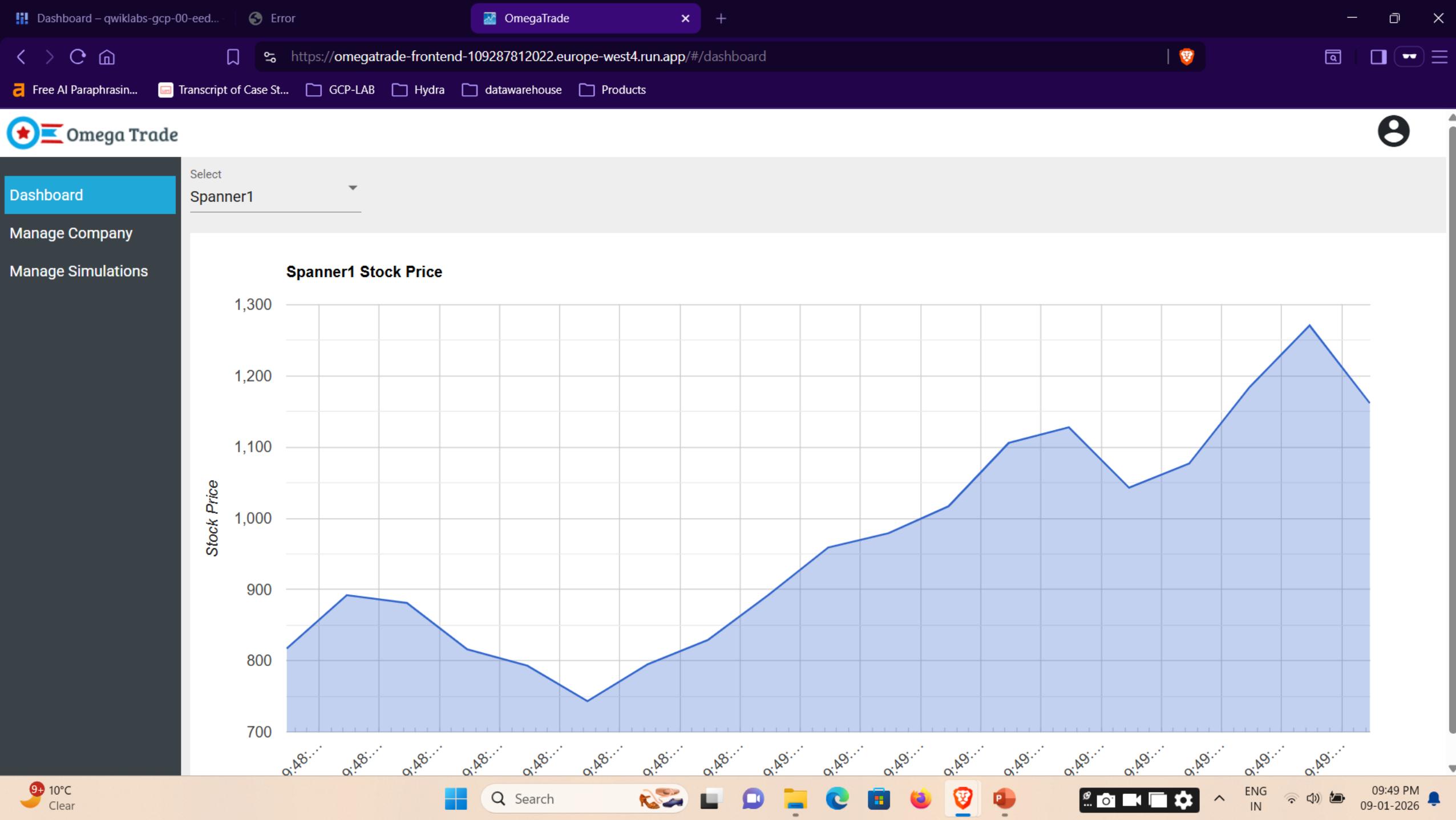
Task 4. Import sample stock trade data to the database

Task 5. Build and deploy the frontend component

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Congratulations!

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Dashboard

Manage Company

Manage Simulations

## Company List

Search

Add Company

| Company Name    | Short Code | Action |
|-----------------|------------|--------|
| Spanner1        | SPN        |        |
| Baz Ltd         |            |        |
| Foo Enterprises |            |        |
| Foobar Inc      |            |        |
| Acme Corp       |            |        |
| Bar Industries  |            |        |

### Edit Company Acme Corp

Coyote Inc

ACM

Cancel

Update

Items per page: 10

1 - 6 of 6

< < > >

Dashboard – qwiklabs-gcp-00-eed... | Error | OmegaTrade | +

https://omegatrade-frontend-109287812022.europe-west4.run.app/#/companies

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Omega Trade

Dashboard Manage Company Add Company

Manage Simulations

## Company List

Search

| Company Name    | Short Code | Action |
|-----------------|------------|--------|
| Spanner1        | SPN        |        |
| Baz Ltd         | BAZ        |        |
| Foo Enterprises | FOO        |        |
| Foobar Inc      | FOB        |        |
| Coyote Inc      | ACM        |        |
| Bar Industries  | BAR        |        |

Items per page: 10 1 – 6 of 6 < < > >

9+ 10°C Clear

Search

09:50 PM 09-01-2026 ENG IN

## Instances

## Create instance

[+ Create free instance](#)

## View fleet health

Spanner is an always-on, globally consistent database with virtually unlimited scale. Build intelligent applications with a single database that brings together relational, graph, key-value, and search functionalities. The elimination of maintenance windows ensures uninterrupted service for mission-critical applications. [Learn more](#)

 Filter Enter property name or value

| <input type="checkbox"/> | Name <span>↑</span>                 | ID                  | Edition  | Configuration                 | Processing units <span>?</span> | Nodes <span>?</span> | Scaling mode      | Storage utilization <span>?</span>  | Labels <span>?</span> | Tags <span>?</span> |
|--------------------------|-------------------------------------|---------------------|----------|-------------------------------|---------------------------------|----------------------|-------------------|---|-----------------------|---------------------|
| <input type="checkbox"/> | <a href="#">omegatrade-instance</a> | omegatrade-instance | Standard | europe-west4<br>(Netherlands) | 1,000                           | 1                    | Manual allocation | <div style="width: 20%;"><div style="width: 100%;"> </div></div> <span>0 B / 10 TB</span> |                       | —                   |

omegatrade-instance – Overview X OmegaTrade +

https://console.cloud.google.com/spanner/instances/omegatrade-instance/details/databases?cloudshell=true&project=qwiklabs-gcp-00-eed44799d6a7... | 2

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Spanner All instances > Instance omegatrade-instance: Overview Edit instance Delete instance Open in Dataplex Learn Hide info panel

INSTANCE Overview Import/Export Backup/Restore Instance partitions ... OBSERVABILITY System insights Query insights Lock insights Transaction insights Hotspot insights Release Notes CLOUD SHELL

omegatrade-db

Default backup schedule Enabled

Instance summary Statistics are updated every 3-5 minutes, which may cause some delay in actual data.

Compute capacity ② CPU utilization (high) Operations Throughput  
1000 PUs (1 node) 0.98% Read: 0.45/s Read: 79 B/s Write: 0.22/s Write: 109 B/s

Create database Import my own data Explore datasets Refresh

Filter databases

| Name          | Dialect             | CPU utilization | Size | Backup schedules |
|---------------|---------------------|-----------------|------|------------------|
| omegatrade-db | Google Standard SQL | 0.98%           | 0 B  | 1                |

Open Editor

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Search

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Add principal Show inherited roles in table Display roles inherited from the parent resources in the table below

Filter Enter property name or value

Role / Principal Inheritance

- Editor (2)
- Owner (3)
- Viewer (1)

omegatrade-db – Overview – qw X OmegaTrade +

https://console.cloud.google.com/spanner/instances/omegatrade-instance/databases/omegatrade-db/details/tables?cloudshell=true&project=q... | 2

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DATABASE Overview Spanner Studio Import/Export Backup/Restore Operations Change streams

OBSERVABILITY System insights Query insights Lock insights Transaction insights Hotspot insights Release Notes

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Spanner Overview

All instances > Instance omegatrade-instance: Overview > Google Standard SQL Database omegatrade-db: Overview

CPU utilization (mean) 0.98% Operations Read: 0.45/s Write: 0.22/s Throughput Read: 60 B/s Write: 109 B/s Total database storage 0 B

Tables Views

Tables are structured with rows, columns, and values, and they contain primary keys and indexes. Parent-child relationship between tables can be defined through table interleaving or foreign keys. [Learn more](#)

+ Create table

Filter Filter tables

| Name ↑                        | Schema  | Indexes | Interleaved in | Watched by | Table Size |
|-------------------------------|---------|---------|----------------|------------|------------|
| <a href="#">companies</a>     | Default | 2       | –              | –          | –          |
| <a href="#">companyStocks</a> | Default | –       | –              | –          | –          |
| <a href="#">simulations</a>   | Default | –       | –              | –          | –          |
| <a href="#">users</a>         | Default | 1       | –              | –          | –          |

Show equivalent ddl

omegatrade-db

Edit or delete roles below, or select "Add principal" to grant new access. [Add principal](#)

Show inherited roles in table  
Display roles inherited from the parent resources in the table below

Filter Enter property name or value

Role / Principal Inheritance

- Editor (2)
- Owner (3)
- Viewer (1)

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omegatrade-db – Overview – qw X OmegaTrade +

https://console.cloud.google.com/spanner/instances/omegatrade-instance/databases/omegatrade-db/tables/companies/details/schema?cloudshell=true&project=qwiklabs-gcp-00-eed44799d6a7

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Spanner All instances > Instance omegatrade-instance: Overview > Google Standard SQL Database omegatrade-db: Overview > Table companies: Write DDL Delete database Hide info panel

Table Schema Indexes Data

CPU utilization (mean) 0.98% Operations Read: 0.45/s Write: 0.22/s Throughput Read: 60 B/s Write: 109 B/s Total database storage 0 B

Tables Views

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|-------------------------------|---------|---------|----------------|------------|------------|
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| <a href="#">companyStocks</a> | Default | –       | –              | –          | –          |
| <a href="#">simulations</a>   | Default | –       | –              | –          | –          |
| <a href="#">users</a>         | Default | 1       | –              | –          | –          |

Show equivalent ddl

Cloud Shell Open Editor

Release Notes

Filter Enter property name or value

Role / Principal Inheritance

Editor (2)

Owner (3)

Viewer (1)

companies – Data – qwiklabs-gcp X OmegaTrade +

https://console.cloud.google.com/spanner/instances/omegatrade-instance/databases/omegatrade-db/tables/companies/details/data?cloudshell... | 2

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Spanner All instances Instance omegatrade-instance: Overview Google Standard SQL Database omegatrade-db: Overview Table companies: Data Write DDL Delete table

Table Schema Indexes Data

Data

Insert Edit Delete

Filter Filter data

| companyId                            | companyName     | companyShortCode | created_at                  |
|--------------------------------------|-----------------|------------------|-----------------------------|
| 0a24c698-4743-4261-a666-6c32e9777160 | Bar Industries  | BAR              | 2021-07-03T10:39:26.82062Z  |
| 32fd997c-ca12-4584-a3df-69341c549518 | Spanner1        | SPN              | 2026-01-09T16:17:10.670928Z |
| 6be1cce4-7a36-4c56-9376-9e9f26176c07 | Coyote Inc      | ACM              | 2021-07-03T10:39:51.402504Z |
| b9a9678d-4f88-4b13-83b9-78a0e4af7a1f | Baz Ltd         | BAZ              | 2021-07-03T10:41:48.880233Z |
| bb2420c3-9d7c-4e23-bb12-0405a24485b6 | Foo Enterprises | FOO              | 2021-07-03T10:40:36.2285Z   |
| f115eff6-0a3c-4390-9b4f-19276b560fae | Foobar Inc      | FOB              | 2021-07-03T10:40:12.31148Z  |

Release Notes

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companies – Data – qwiklabs-gcp x OmegaTrade +

https://console.cloud.google.com/spanner/instances/omegatrade-instance/databases/omegatrade-db/tables/companies/details/data?cloudshell... | t<sup>2</sup>

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Spanner All instances > Instance omegatrade-instance: Overview > Google Standard SQL Database omegatrade-db: Overview > Table companies: Data Write DDL Delete table

Table Schema Indexes Data

Data

Insert Edit Delete

Filter Filter data

| companyid                            | companyName     | companyShortCode | created_at                  |
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| 32fd997c-ca12-4584-a3df-69341c549518 | Spanner1        | SPN              | 2026-01-09T16:17:10.670928Z |
| 6be1cce4-7a36-4c56-9376-9e9f26176c07 | Coyote Inc      | ACM              | 2021-07-03T10:39:51.402504Z |
| b9a9678d-4f88-4b13-83b9-78a0e4af7a1f | Baz Ltd         | BAZ              | 2021-07-03T10:41:48.880233Z |
| bb2420c3-9d7c-4e23-bb12-0405a24485b6 | Foo Enterprises | FOO              | 2021-07-03T10:40:36.2285Z   |
| f115eff6-0a3c-4390-9b4f-19276b560fae | Foobar Inc      | FOB              | 2021-07-03T10:40:12.31148Z  |

Release Notes

CLOUD SHELL

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Cloud Shell

console.cloud.google.com/spanner/instances/.../query;showWriteDdlOptInBanner=true?clou...

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omegatrade-db – Spanner Studio X OmegaTrade +

https://console.cloud.google.com/spanner/instances/omegatrade-instance/databases/omegatrade-db/details/query;showWriteDdlOptInBanner=...

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Explorer Run Save Format Clear Documentation

Search Schemas 3 Default Tables 4 companies companyStocks simulations users Change streams 0 Views 0 Models 0 Graphs 0 INFORMATION\_SCHEMA SPANNER\_SYS Roles 3 Placements 1

Run Save Format Clear Documentation

1 UPDATE  
2 | companies  
3 SET  
4 | companyName='Consolidated Enterprises Inc'  
5 WHERE  
6 | companyName='Bar Industries';

Results Explanation ②

1 row updated

This statement updated 1 row and did not return any rows.

CLOUD SHELL Terminal (qwiklabs-gcp-00-eed44799d6a7) + 1 row updated by your query Open Editor

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Search

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## Select

## Consolidated Enterpr...

Consolidated Enterprises Inc Stock Price

