Spring Boot + GCP Cloud SQL (PostgreSQL) Deployment Guide

Step 1: Create Cloud SQL PostgreSQL

In Cloud Shell:

```
export INSTANCE_NAME=my-postgres
export REGION=us-central1
export DB_NAME=mydb
export DB_USER=postgres
export DB_PASS=MyPassword123

gcloud sql instances create $INSTANCE_NAME \
   --database-version=POSTGRES_14 \
   --cpu=1 --memory=4GB \
   --region=$REGION \
   --root-password=$DB_PASS

gcloud sql databases create $DB_NAME --instance=$INSTANCE_NAME
```

Step 2: Configure application.properties

```
spring.datasource.url=jdbc:postgresql:///mydb?cloudSqlInstance=PROJECT_ID:us-central1:my-postgres&soc
ketFactory=com.google.cloud.sql.postgres.SocketFactory
spring.datasource.username=postgres
spring.datasource.password=MyPassword123
spring.datasource.driver-class-name=org.postgresql.Driver
spring.jpa.hibernate.ddl-auto=update
```

Step 3: Add Dependencies

```
<dependency>
   <groupId>org.postgresql</groupId>
   <artifactId>postgresql</artifactId>
</dependency>
<dependency>
   <groupId>com.google.cloud.sql</groupId>
   <artifactId>postgres-socket-factory</artifactId>
   <version>1.10.0</version>
</dependency>
```

Step 4: Dockerfile

```
FROM eclipse-temurin:21-jdk
WORKDIR /app
COPY target/*.jar app.jar
EXPOSE 8080
ENTRYPOINT ["java","-jar","app.jar"]
```

Step 5: Push Image to Artifact Registry

```
gcloud artifacts repositories create springboot-repo \
  --repository-format=docker \
  --location=us-central1

gcloud builds submit --tag us-central1-docker.pkg.dev/$PROJECT_ID/springboot-repo/myapp
```

Step 6: Create Service Account

```
gcloud iam service-accounts create springboot-cloudrun-sa \
  --display-name "Spring Boot Cloud Run SA"

gcloud projects add-iam-policy-binding $PROJECT_ID \
  --member="serviceAccount:springboot-cloudrun-sa@$PROJECT_ID.iam.gserviceaccount.com" \
  --role="roles/cloudsql.client"
```

Step 7: Deploy to Cloud Run

```
gcloud run deploy springboot-api \
  --image=us-central1-docker.pkg.dev/$PROJECT_ID/springboot-repo/myapp \
  --platform=managed \
  --region=us-central1 \
  --allow-unauthenticated \
  --add-cloudsql-instances=$PROJECT_ID:us-central1:my-postgres \
  --service-account=springboot-cloudrun-sa@$PROJECT_ID.iam.gserviceaccount.com \
  --set-env-vars=SPRING_PROFILES_ACTIVE=prod
```

Step 8: Verify & Logs

Use the deployed URL to access the app.

View logs:

```
gcloud logs read --limit=50
```

Optional: Clean Up

```
gcloud run services delete springboot-api --region=us-central1
gcloud sql instances delete my-postgres
```