CLOUD BASICS

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Google Cloud Platform (GCP) provides a variety of service choices. Which of the following services is infrastructure as a service (IaaS)? (Choose 1)

A. App Engine
B. Cloud Function
C. Compute Engine
D. Google Kubernetes Engine

Feedback: Compute Engine is the correct answer. WIth IaaS, only the underlying architecture is provided. The user still has to select and care for an operating system and install the required applications.

The Google Cloud Platform (GCP) hierarchy helps you manage resources across multiple departments and multiple teams within an organization. Which of the following is at the top level of this hierarchy? (Choose 1)

A. Folder
B. Organization
C. Project
D. Resource

Feedback: The top level of a GCP hierarchy is an organization. Permissions set on the organization will be inherited by all child resources.

Cloud Identity and Access Management (Cloud IAM) allows you to manage privileges. What do these privileges apply to? (Choose 1)

A. Applications.
B. Operating systems.
C. Google Cloud Platform (GCP) resources.
D. Applications, GCP, and operating systems.

Feedback: IAM only applies to the GCP resources you use. Application and operating system security must be handled separately.

Projects form part of the Google Cloud Platform (GCP) resources hierarchy. Which of the following is true concerning projects? (Choose 1)

A. Projects are only used for billing.
B. You can nest projects inside projects.
C. Projects are allocated a changeable Project ID.
D. All resources must be associated with a project.

Feedback: The GCP resources you use, no matter where they reside, must belong to a project.

Google Cloud provides resources in multi-regions, regions, and zones. What best describes a zone? (Choose 1)

A. An edge location.

B. One or more data centers.

C. A point of presence (PoP).

D. Geographic location to leverage services.

Feedback: Regions are made up of zones. Each Region will have at least 3 data centers or zones to provide high availability.

What type of service best describes Google Kubernetes Engine? (Choose 1)

A. Hybrid

B. IaaS

C. PaaS

D. SaaS

Feedback: GKE is a hybrid service. On the one hand, the infrastructure is managed for Kubernetes. But you still have to run Kubernetes to build your applications.

Which of the following best describes a major advantages GCP has over other cloud providers? (Choose 1)

A. Google uses satellite links as a way of interconnecting Regions, Zones, and POPS..

B. Google leverages traditional networking gear from commercial vendors..

C. Google leases fiber from multiple vendors. In the event of a vendor's fiber failing, another vendors network can be used as a backup.

D. Google owns one of the largest networks in the world. All regions and zones are connected on the same network.

Feedback: Google owns one of the worlds largest networks with 100,000s of kilometers of fiber and over 100 POPs all interconnecting regions and zones. The network also leverages multiple intercontinental fiber connections.

Regions are independent geographic areas on the same continent. Which of the following is a regional service? (Choose 1)

A. Cloud Datastore

B. HTTPS Load Balancer

C. Network

D. Virtual machine

Feedback: Cloud Datastore is an example of a service that is regional. HTTPS load balancers and networks are global, and virtual machines are zonal.

USER INTERFACE

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What is the purpose of a folder? (Choose 1)

A. Used to organize projects.

B. Used to organize instances.
C. Used to organize users.
D. Folders are not part of the hierarchy.
Feedback: Folders are used to organize projects. You can put projects or other folders into a folder.

What does it mean for a system to be elastic? (Choose 1)
A. The system is multi-cloud.
B. The system can bounce back after an outage.
C. The system can be moved from region to region.
D. The system can add and remove resources based on need.
Feedback: Elastic systems can add or remove resources based on performance needs.

You are using Google Cloud to provide a platform as a service (PaaS) solution using App Engine. When will you be billed for the resources required? (Choose 1)
A. You pay for the resources during peak periods.
B. You pay for the resources when you allocate them.
C. You pay for the resources when they are consumed.
D. You pay for the resources when you deploy the application.
Feedback: When using a PaaS model service offering like App Engine in Google Cloud, you are only billed when the resource is actually running.

You want to migrate data from your old database to the cloud. You **do not want to manage the underlying architecture or the database application**. Which cloud service type should you choose? (Choose 1)
A. IaaS
B. SaaS
C. PaaS
D. Hybrid
Feedback: For software as a service, the infrastructure, platform, and software is managed for you. All that's required is that you bring your data to the system.

You have changed the name of your project. You want to change the name of the project ID as well, but are not able to do so. Why is this? (Choose 1)
A. The name of the project has been changed.
B. The project ID and project number are fixed.
C. The relevant Cloud Identity and Access Management (Cloud IAM) privileges are not assigned to you.
D. The relevant Cloud Identity and Access Management (Cloud IAM) policies are not assigned to you.
Feedback: The project number and project ID are unique across Google Cloud and cannot be changed. The project ID is generated from the project name you enter when you create the project in the Cloud Console.

You need to recover a Compute Engine instance that was in a project that you just accidentally deleted. You do not have a backup or archive copy of the instance. How can you retrieve this instance? (Choose 1)

A. Recreate the project folder.

B. The instance cannot be recovered.

C. Recover the deleted compute instance.

D. Restore the project from accidental deletion.

Feedback: Project owners can restore a deleted project within the 30-day recovery period that starts when the project is shut down. Restoring a project returns it to the state it was in before it was shut down.

You need to deploy several applications to the us-central1 region. How should you deploy the applications to enable fault tolerance and high availability? (Choose 1)

A. Deploy the applications in a single zone.

B. Deploy the applications to a different region.

C. Deploy duplicate applications in a single zone.

D. Deploy the applications across multiple zones.

Feedback: Deploying applications across multiple zones enables fault tolerance and high availability. Putting resources in different zones in a region provides isolation from most types of physical infrastructure and infrastructure software service failures.

How would you configure the Cloud SDK to work on your laptop? (Choose 1)

A. Edit the .profile file of the SDK.

B. Run the gcloud init command.

C. Sync your laptop with Cloud Shell.

D. Download the config file from https://cloud.google.com.

Feedback: The gcloud init command sets your login, your default project, and your default region and zone.

Which command line tool can be used to **manage Cloud Storage**? (Choose 1)

A. bq

B. Cloud Shell

C. gcloud

D. gsutil

Feedback: The gsutil CLI tool is used for managing Cloud Storage.

True or False. When using Cloud Shell you must also install the Cloud SDK locally to manage your projects and resources.

False

Feedback: The answer is False. Using Cloud Shell, you can manage your projects and resources easily without having to install the Cloud SDK or other tools locally.

True or False. Cloud Shell code editor is one of the developer tools built into the Cloud console.

True

Feedback: The answer is True. Cloud Shell, Cloud Shell code editor, and Cloud Source Repositories are all examples of developer tools built into the GCP console.

Every Cloud service you use is associated with a project. Which of the following statements regarding projects are correct? (Choose 2)
A. Projects have a single owner.
B. A project cannot be restored once deleted.
C. Projects are billed and managed collectively.
D. Projects are the basis for enabling and using GCP services.
E. Each project is a separate account, and each resource belongs to exactly one.
Feedback: Projects are the basis for enabling and using GCP services, like managing APIs, enabling billing, adding and removing collaborators, and enabling other Google services. Each project is a separate account, and each resource belongs to exactly one. Projects can have different owners and users. They're billed separately, and they're managed separately.

How would you configure billing notifications in GCP? (Choose 1)
A. Configure budgets and alerts.
B. Set up a billing alert in Stackdriver.
C. Use Cloud Functions to fire off an email with daily budget totals.
D. Enable a script using cron to kick off when a threshold is reached.
Feedback: To be notified when costs approach your budget limit, you can define a budget and create an alert.

What best describes the purpose of quotas? (Choose 2)
A. Quotas are used to send billing alerts.
B. Configuration used to prevent billing surprises.
C. Configuration used by Google to prevent building large systems.
D. Configuration used to prevent over consumption due to malicious attacks.
E. Quotas can automatically build infrastructure based on Stackdriver metrics.
Feedback: Google Cloud Platform (GCP) enforces quotas on resource usage, setting a hard limit on how much of a particular GCP resource a project can use. Quotas are designed to help prevent billing surprises and to prevent overconsumption of resources due to malicious attacks.

True or False. s3config is a command-line option for the Cloud SDK?
False
Feedback: The answer is False. s3config is not a command-line option. gcloud (all), gsutil (Cloud Storage), and bq (BigQuery) are the command-line options that are part of the Cloud SDK.

How would you test a Google API and learn how it works? (Choose 1)
A. Use the help files in Cloud Shell.
B. Use the gcloud command in the Cloud SDK.

C. Use the APIs Explorer that is part of the GCP console.
D. Use the console to get the directions on how to build the api by service.
Feedback: APIs Explorer helps you learn about the APIs interactively. It lets you see what APIs are available, in what versions, as well as how they work.

In what format will a majority of the APIs return data in? (Choose 1)
A. JSON
B. TEXT
C. XML
D. YAML
Feedback: The format an API will return data in is JSON.

You want team members working on separate projects to be able to **collaborate** on the development of an application. You want to manage all access to the project and development in Google Cloud. Which Google Cloud service will allow your team to store, manage, and track code? (Choose 1)
A. Cloud API
B. Cloud Storage
C. Cloud Source Repositories
D. The Cloud Shell code editor
Feedback: Cloud Source Repositories provides Git version control to support collaborative development of any application or service.

You require detailed usage and cost estimation information about a project from your Google Cloud billing data. What action can you take in the Google Cloud Billing console to accomplish this? (Choose 1)
A. Export the information to Cloud APIs.
B. Export the billing information to Google Data Studio.
C. Export the information to a BigQuery dataset.
D. Export the statistical information to Cloud Logging.
Feedback: Cloud Billing export to BigQuery enables you to export detailed Google Cloud billing data (such as usage and cost estimate data) automatically throughout the day to a BigQuery dataset that you specify. Then you can access your Cloud Billing data from BigQuery for detailed analysis, or use a tool like Data Studio to visualize your data.

You are a reseller of Google Cloud services. You want to invoice your clients separately for the resources that they use. How can you achieve this? (Choose 1)
A. Set up a billing subaccount for each customer.
B. Link billing account information at the resource level.
C. Create a new billing account for every single customer.
D. Create a billing account basic user for each customer.
Feedback: Billing subaccounts allow you to group charges from projects together on a separate section of your invoice. A billing subaccount is a billing account with a billing

linkage to a reseller's master billing account on which the charges appear. Subaccounts are intended for resellers.

You are onboarding a new co-worker. You want them to familiarize themselves with Google Cloud but not start any resources which could incur a cost. What action can you take? (Choose 1)
A. Create a project with only free resources.
B. Provide training credits to the new co-worker.
C. Create a project that does not link to a billing account.
D. Create a script that deletes instances when they incur a cost.
Feedback: You can link your billing account to zero or more projects. Projects that you do not link to any billing account can only use free Google Cloud services.

You want to automatically shutdown resources in a project if the budget exceeds a specified amount. What actions can you take to accomplish this? (Choose 2)
A. Define an alert at the billing account level.
B. Create a service account with the iam.serviceAccounts.delete role.
C. Assign the compute.quotas.get permission to the billing account role.
D. Create a webhook in response to the alert that will trigger a shutdown script.
E. Create an alert to notify the Billing Account Administrator to shutdown the resources manually.
Feedback: You can set up a webhook to be called in response to an alert. This webhook can control automation based on billing alerts.

You want to edit the code of a sample application from within your Cloud Shell environment. You do not want to launch a text based editor from the Cloud Shell prompt. What tool can you utilize to achieve this? (Choose 1)
A. Notepad
B. Visual Editor (VI)
C. The Cloud Shell SDK
D. The Cloud Shell code editor
Feedback: The built-in Cloud Shell code editor provides the convenience of viewing and editing files in the same environment where projects are built and deployed.

[LAB - A Tour of Qwiklabs and Google Cloud] You want to add additional members to your project but are unable to do so. In the Cloud Console in the cloud IAM & admin section you can see that you have the roles/viewer permission. What role do you need in order to add a member to the project? (Choose 1)
A. roles/owner
B. roles/editor
C. roles/custom
D. iam/serviceAccounts.actAs
Feedback: You need to have the basic role of roles/owner in order nanage roles and permissions for a project and all resources within the project.

[LAB - A Tour of Qwiklabs and Google Cloud] You want to ensure that files you are working on in the Cloud Shell persist across multiple sessions. What action must you take to ensure this happens? (Choose 1)
A. Save the files in your home directory.
B. All saved files are persistent across sessions.
C. Archive your files to a persistent disk.
D. Export your files to Cloud Storage.
Feedback: The contents of your Cloud Shell Home directory persists across projects between all Cloud Shell sessions, even after the virtual machine terminates and is restarted.

[LAB - Getting Started with Cloud Shell & gcloud] You want to use the auto-prompting feature to help you learn the gcloud command syntax. What actions must you take in the Cloud Shell in order to enable auto prompting for commands and flags with inline help snippets? (Choose 1)
A. Auto complete functionality is enabled by default.
B. Click on the Tab key twice to enable gcloud interactive mode.
C. Install the gcloud beta components and enter gcloud interactive mode.
D. Change to your current working directory and run autocomplete.
Feedback: Gcloud interactive has auto prompting for commands and flags, and displays inline help snippets in the lower section as the command is typed. Static information, like command and sub-command names, and flag names and enumerated flag values, are auto-completed using dropdown menus. When using the interactive mode, click on the Tab key to complete file path and resource arguments.

[LAB - Getting Started with Cloud Shell & gcloud] You are using the Cloud Shell to create a virtual machine. You run the gcloud compute command to create a virtual machine but omit the --zone flag. What effect will this have when provisioning the machine? (Choose 1)
A. The virtual machine will be created initially but fail.
B. Gcloud will prompt you to enter the zone information.
C. Gcloud will infer your desired zone based on your default properties.
D. The virtual machine will be deployed in the nearest zone to your location.
Feedback: If you omit the --zone flag, gcloud can infer your desired zone based on your default properties. Other required instance settings, like machine type and image, if not specified in the create command, are set to default values.

COMPUTE

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None of the pre-defined instance types fit your application. What do you do? (Choose 1)
A. Set up autoscaling.
B. Do nothing, the instance will size itself.
C. Over allocate resources for the instance.

D. Create a custom virtual machine that fits your needs.
Feedback: Custom instance types are useful when none of the pre-defined options meet your needs or you need to use GPUs or a specific CPU platform.

True or False. Compute Engine pricing is based on a daily rate for the instance.
False
Feedback: The answer is False. You are billed for the first minute at boot-time and then per second of use.

True or False. Stackdriver metrics can be used to trigger an autoscaling event.
True
Feedback: The answer is True. Stackdriver metrics, CPU usage, and load balancer usage are all examples of triggers for an autoscaling event.

Which of the following virtual disk types is ephemeral? (Choose 1)
A. Cloud Storage
B. HD Persistent Disk
C. Local SSD
D. SSD Persistent Disk
Feedback: Local SSD disks are ephemeral. If the VM is shut down or crashes the disk gets destroyed.

You want to use App Engine, but you will need to use a custom runtime. Which of the following is the best option? (Choose 1)
A. App Engine Internal
B. App Engine Flexible
C. App Engine Standard
D. Google Kubernetes Engine
Feedback: App Engine Flexible allows for custom runtimes, use of persistent disks, and the ability to log into the infrastructure.

Time-to-market is highly valuable to you and you want to be able to focus on writing code without ever having to touch a server, cluster, or infrastructure. Which service suits your needs? (Choose 1)
A. App Engine
B. Compute Engine
C. BigQuery
D. Google Kubernetes Engine
Feedback: App Engine is a PaaS option. The only part of the infrastructure you manage is your code.

True or False. Python is a runtime option for Cloud Functions.
True

Feedback: The answer is True. Cloud Functions supports code written in Go, Python, and Node.js.

Which of the following can trigger Cloud Functions?
A. App Engine notification
B. Email
C. Stackdriver alert
D. Webhook
Feedback: Cloud Functions can be triggered by a webhook, an action to a Cloud Storage bucket, or a message in Cloud Pub/Sub.

Google Kubernetes Engine is built on the open-source Kubernetes system. Which of the following statements best describes what Kubernetes is? (Choose 1)
A. A format of container.
B. A virtualization platform.
C. An orchestration engine to manage containers.
D. An execution environment for building and connecting cloud services.
Feedback: Kubernetes is used for container orchestration. It helps you manage your containerized application environment.

Which of the following is the container format used with Google Kubernetes Engine? (Choose 1)
A. Docker
B. Glassfish
C. Rocket
D. Spinnaker
Feedback: Docker is the container format of choice for GKE. Spinnaker, Rocket, and Glassfish are not container formats.

You are building a VM for data analysis. You want a disk that will deliver very high Input/Output operations (IOPs) and very low latency. The files will be copied to the VM from Cloud Storage in order to perform the analysis. Which option should you choose? (Choose 1)
A. File Store
B. Local SSD
C. HDD Persistent Disk
D. Cloud Storage bucket
Feedback: Unlike persistent disks, local SSDs are physically attached to the server that hosts your VM instance. This tight coupling offers superior performance, very high input/output operations per second (IOPS), and very low latency compared to persistent disks. Local SSD disks are ephemeral. If you store important data in a local SSD device, you must also store that same data in a durable storage option.

You created several single vCPU virtual machines with SSD persistent disks attached for an application. The amount of input/output operations per second (IOPs) required by the

application have increased and performance is no longer satisfactory. What actions can you take to improve disk I/O? (Choose 2)

A. Defragment the volume.

B. Reduce the number of vCPU.

C. Increase the number of vCPUs.

D. Increase the number of volumes attached.

E. Increase the size of the SSD persistent disks.

Feedback: IOPS performance of SSD persistent disks depends on the number of vCPUs in the instance in addition to disk size. Performance scales linearly until it reaches either the limits of the volume or the limits of each Compute Engine instance.

You need to deploy a web application that has been provided by your development team as a **Docker container**. You do not want to manage any infrastructure for this application. Which Google compute environment should you choose? (Choose 1)

A. Cloud Functions

B. App Engine Flexible

C. App Engine Standard

D. Google Kubernetes Engine

Feedback: App Engine Flexible runs your application in a Docker container environment and is a fully managed service.

You want to use Cloud Functions to create a response to certain events.
You also want to capture and act on these events. What must you configure to achieve this? (Choose 2)

A. Create a trigger.

B. Write an API call.

C. Write a function in Ruby.

D. Bind a function to a trigger.

E. Allocate compute instance resources.

Feedback: Creating a response to an event is done with a trigger. A trigger is a declaration that you are interested in a certain event or set of events. Binding a function to a trigger allows you to capture and act on events.

You want to deploy a web server in a **containerized environment**. You also want to install the system on local servers in the cloud, manage container networking and data storage, deploy rollouts and rollbacks, and monitor and manage container and host health. Which solution should you choose? (Choose 1)

A. Cloud Functions

B. App Engine flexible environment

C. App Engine standard environment

D. Google Kubernetes Engine

Feedback: Kubernetes is a container orchestration tool you can use to simplify the management of containerized environments. You can install Kubernetes on a group of

your own managed servers or run it as a hosted service in Google Cloud on a cluster of managed Compute Engine instances called Google Kubernetes Engine.

Kubernetes makes it easy to orchestrate many containers on many hosts, scale them as microservices, and deploy rollouts and rollbacks. It was built by Google to run applications at scale. Kubernetes lets you install the system on local servers in the cloud, manage container networking and data storage, deploy rollouts and rollbacks, and monitor and manage container and host health.

[LAB - Creating a Virtual Machine] You want to configure a virtual machine with a large amount of **RAM**. Which option in the Cloud Console should you modify when creating the virtual machine to select the amount of RAM? (Choose 1)
A. CPU Platform
B. Reservations
C. Machine Type
D. Instance Type
Feedback: A machine type is a set of virtualized hardware resources available to a virtual machine (VM) instance, including the system memory size, virtual CPU (vCPU) count, and persistent disk limits.

[LAB - Creating a Virtual Machine] You deploy a virtual machine in the Google Cloud Shell using the following command 'gcloud compute instances create gcelab2 --machine-type n1-standard-2 --zone us-central1-a'. What operating system is deployed by default? (Choose 1)
A. The latest CentOS image.
B. The latest Ubuntu image.
C. The latest Debian image.
D. The latest Windows image.
Feedback: There are a number of images to choose from, including: Debian, Ubuntu, CoreOS as well as premium images such as Red Hat Enterprise Linux and Windows Server. Debian is the default OS deployed.

[LAB - Creating a Virtual Machine] You want to create a virtual machine running the latest version of the SUSE Linux Enterprise Server **operating system**. Which option in the Cloud Console should you modify when creating the virtual machine? (Choose 1)
A. Boot disk
B. Machine Type
C. Machine Family
D. Machine Configuration
Feedback: Modifying the boot disk option allows you to change the operating system type, version, boot disk type and the size in gigabytes of the disk.

[LAB - Creating a Virtual Machine] You have connected to your Linux virtual machine using the SSH Connect button in the Cloud Console. You run the command 'apt-get update' but receive the error 'permission denied.' What action must you take in order to run the command? (Choose 1)

A. Get root access using the sudo command and retry.
B. Change to the current user's HOME directory and retry.
C. Change your Role in the IAM & Admin console and retry.
D. Run the command in the Cloud Console and redirect to the VM.
Feedback: Sudo allows your user to run the apt-get command with the security privileges of root.

[LAB - App Engine: Qwik Start - Python] You are testing an application that you are developing for deployment on Google App Engine locally using the Google Cloud development server (dev_appserver.py). You make a change to the welcome message that is displayed in your application's main.py file and save it. What action must you now take in order to view the change? (Choose 1)
A. Restart the application
B. Redeploy the application
C. Reload your web browser
D. Restart the development server
Feedback: You can leave the local dev_appserver.py development server running while you develop your application. The development server watches for changes in your source files and reloads them if necessary. Reloading the web browser is sufficient to see the change.

[LAB - App Engine:Qwik Start - Python] You want to deploy your application using App Engine. You execute the command 'gcloud app deploy' without specifying any additional parameters. What is the next action you must perform before Google App Engine is deployed? (Choose 1)
A. Choose the Cloud Storage bucket location.
B. Choose the repository location for the YAML files.
C. Choose the zone where App Engine will be created.
D. Choose the region where App Engine will be located.
Feedback: When you deploy App Engine you will be prompted for the region that you want to locate it in. You enter the number that represents your region and the App Engine application will then be created.

[LAB - Cloud Functions: Qwik Start - Command Line] You have created a function called helloWorld that parses the call to the function and logs a message. You execute the command 'gcloud beta functions call helloWorld --data '{"message":"Hello World!"}' to test that the function writes a message to the cloud log. What can you search for in the Cloud Functions logs to verify that the specific test call you made completed successfully? (Choose 1)
A. LEVEL
B. NAME
C. EXECUTION_ID
D. FUNCTION LOG
Feedback: After you deploy a function and know that it is active, you can test that the function writes a message to the cloud log. The cloud tool returns the execution ID for

the function, which means a message has been written in the log. You can view the logs to confirm that there are log messages with that execution ID.

STORAGE

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GCP has many storage options. Which would be the best option for **unstructured storage**? (Choose 1)
A. Cloud Bigtable
B. Cloud Datastore
C. Cloud SQL
D. Cloud Storage
Feedback: Cloud Storage is an HTTPS-based object store that is ideal for unstructured storage.

What is the largest object that you can store in Cloud Storage? (Choose 1)
A. 1 GB
B. 5 TB
C. Unlimited
D. Dependant on the storage class
Feedback: While Cloud Storage offers a virtually unlimited amount of storage, a single object has a limitation of 5 TB.

What Cloud Storage storage class would be an inexpensive option for backups that you test once a month? (Choose 1)
A. Coldline
B. Multi-regional
C. Nearline
D. Regional
Feedback: Nearline storage is designed to provide inexpensive storage for items accessed no more than once a month. While the price for storing objects is cheaper than Standard, Nearline charges for access to storage.

GCP has different options for SQL-based managed services. Which of these options is **horizontally scalable and globally available**? (Choose 1)
A. Cloud Bigtable
B. Cloud Datastore
C. Cloud Spanner
D. Cloud SQL
Feedback: Cloud Spanner is unique in that it is a horizontally scalable, globally available database service offering up to five nines of availability.

Which of the following database engines does Cloud SQL support? (Choose 2)
A. DB2
B. MongoDG
C. MySQL
D. Oracle
E. PostgreSQL
Feedback: Cloud SQL supports PostgreSQL, MySQL, and SQL Server.

True or False. You can use existing SQL skills to query data in Cloud Spanner.
True
Feedback: The answer is True. You can use existing SQL skills to query data in Cloud Spanner using familiar, industry-standard ANSI SQL 2011.

Cloud Datastore is a NoSQL based managed service. Which statement best describes Cloud Datastore? (Choose 1)
A. A document store
B. A data warehouse
C. A relational database
D. A sparse, wide-column database
Feedback: Cloud Datastore is a document store similar to a Mongo Database.

Cloud Bigtable provides a NoSQL based managed service option. Which one of the following is a valid use case for this service? (Choose 1)
A. An object store.
B. A data warehouse.
C. A transactional database for a bank.
D. A backend for an Internet of Things (IoT) system.
Feedback: The sparse, wide table format and extremely low write latency of Cloud Bigtable makes it a great option for fast streaming services like IoT.

You have non-relational data and want a serverless database without having to worry about nodes or cluster management. Which service would best suit your needs? (Choose 1)
A. Cloud Bigtable
B. Datastore
C. Cloud Spanner
D. Cloud SQL
Feedback: Cloud Datastore is the only option that does not require the construction of a server.

Which of the following storage options is not a database? (Choose 1)
A. BigQuery
B. Cloud Bigtable
C. Cloud Spanner
D. Cloud SQL

Feedback: BigQuery is the only option that is not a database. The backend of BigQuery is columnar storage.

You have analyzed your data and want to transfer relevant files to Cloud Storage. Which data types are most suited for this type of storage? (Choose 2)
A. Images
B. Documents
C. Stock Information
D. Billing Information
E. Customer Transactions
Feedback: If you need a solution to hold files, backups, logs, and blobs, a good unstructured solution would be Cloud Storage. If you want to store transactions and other structured data you should use a database.

You require a storage solution that will host videos to be streamed frequently and globally. The solution must be geographically redundant. Which solution should you choose? (Choose 1)
A. Archive
B. Coldline
C. Nearline
D. Standard
Feedback: When used in a multi-region, Standard Storage is appropriate for storing data that is accessed around the world, such as serving website content, streaming videos, executing interactive workloads, or serving data supporting mobile and gaming applications.

You must support the retrieval of objects that have been overwritten or deleted using Cloud Storage. Which feature should you enable to achieve this? (Choose 1)
A. Archiving
B. Snapshots
C. Cloud API
D. Object Versioning
Feedback: To support the retrieval of objects that are deleted or overwritten, Cloud Storage offers the Object Versioning feature.

You want to define user access to **individual files** on a Cloud Storage bucket. You want users to only be able to read from a single object. What type of user permission should you define to achieve this? (Choose 1)
A. Cloud IAM Role
B. Actions Viewer Role
C. Access Control Lists
D. Access Approval Role
Feedback: You most likely want to use ACLs if you need to customize access to individual objects within a bucket, since Cloud IAM permissions apply to all objects within a bucket. However, you should still use Cloud IAM for any access that is common

to all objects in a bucket, because this reduces the amount of micromanaging you have to do.

You require a fully managed NoSQL database to store user profile information for your application. Which solution should you deploy? (Choose 1)
A. Cloud SQL
B. Cloud Storage
C. Cloud Spanner
D. Datastore
Feedback: Datastore is a highly scalable NoSQL database for applications. It's ideal for storing user profiles to deliver a customized experience based on the user's past activities and preferences.

You need a fully managed NoSQL database solution for large-scale, low-latency data analytic applications. The database must be able to scale to hundreds of petabytes. Which solution should you deploy? (Choose 1)
A. Cloud SQL
B. Cloud Spanner
C. Cloud Storage
D. Cloud Bigtable
Feedback: Cloud Bigtable is a petabyte-scale, fully managed NoSQL database service for large analytical and operational workloads.

[LAB - Cloud Storage: Qwik Start - CLI/SDK] You want to create a bucket with a particular project name. You execute 'gsutil mb gs://project.1' but receive the error message 'BadRequestException'. Why is this the case? (Choose 1)
A. The bucket name is already taken.
B. Project.1 is not a valid DNS name.
C. Project.1 reveals sensitive information.
D. The bucket name cannot end with a number.
Feedback: Cloud Storage considers bucket names that contain dots to be domain names. Therefore, they must be a syntactically valid DNS name, end with a currently-recognized top-level domain, for example .com, and be created by a user who is authorized to work with the domain name.

[LAB - Cloud Storage: Qwik Start - CLI/SDK] You have executed the command 'gsutil acl ch -u AllUsers:R gs://bucket1/ada.jpg' in Cloud Shell to make the file available to anyone. What visual indicator in the Storage section of the Cloud Console allows you to verify that the permission level has been set? (Choose 1)
A. You see a public link to the image.
B. You see public under storage class
C. You see AllUsers under permissions.
D. You see a green tick next to the bucket.

Feedback: You can use the gsutil acl ch command to grant all users read permission for the object stored in your bucket. The image is now public and this can be verified in the Cloud Console. You see your image with the Public link box checked. Click the name of your file and a new browser will open with your image.

[LAB - Loading Data into Google Cloud SQL] You are deploying Cloud SQL. You need to gain management access to your Cloud SQL instance from Cloud Shell. What action must you take? (Choose 1)
A. Deny the Cloud Shell instance IP address.
B. Allow the Cloud Shell instance IP address.
C. Configure SSH access to the Cloud SQL instance.
D. Configure management access using the GRANT statement.
Feedback: To allow management access to your Cloud SQL instance, you can allow an IP or a range of IP addresses using the --authorized-networks flag, or in the Google Cloud, or using a REST API.

API

W Module 5_APIs REPORT_Naomi Elianora.docx
Which of the following is the most common API format in Google Cloud? (Choose 1)
A. CLI
B. gRPC
C. REST
D. SOAP
Feedback: REST APIs is the default API format for Google Cloud. It is the most common API format today.

What is the purpose of an API? (Choose 1)
A. APIs replace web pages.
B. APIs create GUI interfaces.
C. APIs simplify the way disparate software resources communicate.
D. APIs are non-HTTPS interfaces used to interface with web interfaces.
Feedback: APIs are used to simplify the way different, disparate, software resources communicate. APIs provide a uniform format for different applications to communicate.

Which of the following is the protocol used by REST APIs? (Choose 1)
A. HTTPS
B. RDP
C. SSH
D. Telnet
Feedback: REST API implementations can make use of standards, such as HTTP, URI, JSON, and XML.

You are looking for a managed API service for your cloud-based services? Which of these services would meet your needs? (Choose 1)

A. Apigee Edge

B. Cloud Endpoints

C. CLI

D. gRPC

Feedback: Cloud Endpoints is a managed API Service used to create web front ends to Google Cloud services.

You are looking for a managed API service to provide an API frontend to your **legacy systems**. Which of these services would meet your needs? (Choose 1)

A. **Apigee Edge**

B. Cloud Endpoints

C. CLI

D. gRPC

Feedback: Apigee Edge is a platform for developing and managing APIs used for both cloud and legacy systems. Apigee Edge provides an abstraction for your backend service APIs and provides a variety of services including security, rate limiting, quotas, and analytics.

What are the specifications that Cloud Endpoints supports? (Choose 2)

A. CLI

B. gRPC

C. IEEE

D. OpenAPI

E. RFC

Feedback: GRPC and OpenAPI are the two formats that Cloud Endpoints supports.

True or False. Firebase Authentication and Auth0 are two of the utilities Cloud Endpoints uses to support service-to-service and user authentication.

A. True

B. False

Feedback: The answer is True. Firebase, Auth0, and Google authentication are all used for service-to-service and user authentication.

You need a simple and reliable staging location for your event data on its journey towards processing, storage, and analysis. Which one of the following services should you consider? (Choose 1)

A. Apigee Edge

B. Dataflow

C. Cloud Endpoints

D. Pub/Sub

Feedback: Pub/Sub is a global managed service that provides the storage and distribution of messages. Messages use a publish/subscribe delivery format and can be

delivered either via push or pull messaging. Pub/Sub can serve as a buffer for applications as messages get processed.

What are the types of message delivery supported with Pub/Sub? (Choose 2)
A. Bounce
B. Poll
C. Pull
D. Push
Feedback: Messages can be delivered via push or pull methods.

How does Pub/Sub deliver messages to endpoints?
A. Through an internal ID.
B. Through a publish/subscribe pattern.
C. Messages have to be pulled by the front end.
D. By pushing messages to all available endpoints based on an internal list.
Feedback: Pub/Sub uses a publisher subscription format. Publishers are services or applications that produce messages to another application to process. When messages are placed in a topic, they will ultimately be delivered to an application or service to process via a subscription.

You want to utilize Cloud Endpoint to control access to your API. What actions can you take to achieve this? (Choose 2)
A. Generate a SAML token.
B. Generate and share API keys.
C. Enable the Google APIs Explorer.
D. Validate calls with JSON Web Tokens.
E. Deploy the Identity and Access Management API.
Feedback: Cloud Endpoint allows you to control who has access to your API and validate every call with JSON Web Tokens and Google API keys.

You have a **legacy backend** application that you want to gradually move across to the cloud and convert to microservices. What Google Cloud service can you use to progressively convert the APIs from the backend service to the new cloud-based microservices? (Choose 1)
A. Apigee Edge
B. Pub/Sub
C. Cloud Spanner
D. Cloud Endpoints
Feedback: If you have legacy applications that cannot be refactored and moved to the cloud, consider implementing APIs as a facade or adapter layer. Each consumer can then invoke these modern APIs to retrieve information from the backend instead of implementing functionality to communicate using outdated protocols and disparate interfaces.

You have to implement a solution that allows the Human Resources (HR) system to reliably notify other departmental services that a new employee has been hired without having to directly connect your application to all of the other services. What Google service should you use? (Choose 1)

A. Apigee Edge

B. Dataflow

C. Pub/Sub

D. Cloud Connector

Feedback: Pub/Sub is a real-time messaging service that allows you to capture data and rapidly pass massive amounts of messages between other Google Cloud services and other software applications. One of the primary use cases for inter-app messaging is to ingest streaming event data.

You need to implement a big data analytics platform in the cloud. Into which phase of the common big data processing model would you place Pub/Sub?

(Choose 1)

A. Store

B. Ingest

C. Process

D. Analyze

Feedback: Within the common big data processing model, Pub/Sub is found in the Ingest phase.

You want to deploy and manage an API using Cloud Endpoints. Which application management tasks will Cloud Endpoints help you with ? (Choose 2)

A. Application sizing

B. Data protection

C. Interface definition

D. Asynchronous messaging

E. Authentication and authorization

Feedback: When deploying and managing APIs on your own you should consider the language or format you will use to describe the interface, how you will authenticate services and users who invoke your API, how you will ensure that your API scales to meet demand, and whether your infrastructure log details API invocations and provides monitoring metrics.

You need an application that will send notifications to remote applications that will be offline for extended periods of time. What solution can you implement that will guarantee that the remote applications will receive the notifications when they come back online? (Choose 1)

A. Cloud API

B. Cloud Edge

C. Pub/Sub

D. Cloud Endpoint

Feedback: Pub/Sub acts as a buffer between sending and receiving across software applications, which makes it easier for developers to connect applications. For example, Pub/Sub can be used to guarantee that messages get delivered swiftly to online applications as well as offline applications, when they come back online.

[LAB - Cloud Endpoints: Qwik Start] You want to utilize Cloud Endpoints to create and manage your REST API. What action must you take to achieve this? (Choose 1)
A. Deploy the REST API configuration file to Firebase.
B. Deploy the API's OpenAPI configuration to Service Management.
C. Create the configuration file using gRPC and upload to the Cloud SDK library.
D. Deploy the API's OpenAPI configuration using a service account to Google Apps Script API.
Feedback: Cloud Endpoints uses Service Management, an infrastructure service of Google Cloud, to create and manage APIs and services. To use Endpoints to manage an API, you deploy the API's OpenAPI configuration to Service Management.

[LAB - Cloud Endpoints: Qwik Start] You are managing your API using Cloud Endpoints. The activity logs in Cloud Logging indicate that a single client is excessively calling the API. What action can you take to alleviate this? (Choose 1)
A. Configure VPC quota limits and throttle client traffic.
B. Deploy a Cloud Endpoints configuration that has a quota.
C. Deploy Cloud Endpoints Frameworks and throttle the client.
D. Request additional quota limits using the Cloud Console.

Feedback: Cloud Endpoints lets you set quotas so you can control the rate at which applications can call your API. Quotas can be used to protect your API from excessive usage by a single client. After you deploy an updated Endpoints configuration, it becomes active within a minute.

[LAB - Cloud Endpoints: Qwik Start] You are creating a Cloud Endpoints configuration file for your API. What is the unique identifier that you manually set which will be used to identify the name of the service? (Choose 1)
A. host
B. info.title
C. operationId
D. info.version
Feedback: Cloud Endpoints uses the name you configure in the host field of your OpenAPI document as the name of your service. The name of your API service must be unique on Google Cloud. Because Endpoints uses DNS-compatible names to identify services, Google recommends that you use your API's domain name or subdomain name as the service name.

[LAB - Google Cloud Pub/Sub: Qwik Start - Python] You are configuring a Pub/Sub instance. What should a subscriber do when they receive a message from a Subscription? (Choose 1)
A. Acknowledge each message which marks the message as read.

B. Acknowledge each message and forward it on to other subscribers.
C. Acknowledge each message within a configurable window of time.
D. Acknowledge each message and move the message to the Ack store.
Feedback: A subscriber receives pending messages from its subscription and acknowledges each one to the Pub/Sub service. When a message is acknowledged by the subscriber, it is removed from the subscription's message queue.

SECURITY

w Module 6_Security REPORT_Naomi Elianora.docx

Which statement regarding Google Cloud and data encryption is accurate? (Choose 1)
A. Only data at rest is encrypted.
B. Only data in transit is encrypted.
C. Data is encrypted at rest and in transit.
D. Nothing is encrypted by default. Data must be encrypted by the customer.
Feedback: Google encrypts data at rest and in transit by default. The customer can also encrypt data with customer managed or customer supplied keys.

When comparing on-premises, IaaS, PaaS, and managed services, which option requires the least amount of work for the user in terms of security? (Choose 1)
A. IaaS
B. Managed service
C. On-premises
D. PaaS
Feedback: Managed services usually also manage some of the security burden rather than the user.

True or False. Managing Google Cloud users through Google Groups allows an administrator to manage team identities centrally.
A. True
B. False
Feedback: The answer is False. With Google Groups, if someone leaves the organization or team there's no centralized way to remove their access to the cloud resources immediately. Google Cloud users who are also Google Workspace users can be managed centrally through the Google Admin Console. Alternatively, Cloud Identity can be used for non-Workspace users.

What is the main purpose of a service account? (Choose 1)
A. Lock down a user.
B. Create a user in Google Cloud.
C. Give permissions to a group of users.
D. Allow for service-to-service interaction with Google Cloud.

Feedback: Service accounts allow for the authorization of service-to-service interaction.

<mark>What do basic roles grant permissions to? (Choose 1)</mark>
<mark>A. Folders</mark>
<mark>B. Groups</mark>
<mark>C. Organizations</mark>
D. Projects
<mark>**Feedback: Basic roles, such as Owner, Editor, and Viewer, apply to projects and services.**</mark>

True or False. Admin is an example of a basic role?
A. True
B. False
Feedback: The answer is False. The basic roles are Owner, Editor, Viewer, and Billing Administrator.

When setting up user/role pairings in Google Cloud, which of the following is true? (Choose 1)
A. Permissions are not inherited.
B. Everyone is a project owner by default.
C. The user will always inherit the stricter permission applied.
D. Permissions are inherited and the least restrictive permission will be inherited.
Feedback: Google Cloud uses an inherited permission model. The user will always get the least restrictive permission when inherited.

What service is used to supply encryption keys when users want to manage their own keys? (Choose 1)
A. Cloud HSM
B. Cloud Key Management System
C. Google is encrypted by default. No keys are required.
D. The customer must bring their own keys and manage them.
Feedback: Cloud KMS creates encryption keys in the cloud for customers to manage.

True or False. Identity-Aware Proxy (IAP) allows you to use an application-level access control model instead of relying on network-level firewalls.
A. True
B. False
Feedback: The answer is True. IAP lets you establish a central authorization layer for applications over TLS, so you can use an application-level access control model instead of relying on network-level firewalls.

There are a number of best practices that should be applied to identity and access management. Which of the following does Google recommend? (Choose 1)
A. Use folders to group instances.
B. Use custom roles for all objects.
C. Try to use basic roles instead of pre-defined roles.

D. Use the "principle of least privilege" when distributing permissions.
Feedback: Because of inheritance, Google recommends using the "principle of least privilege" when granting roles.

You want to generate your own encryption keys that will be used for securing the data used by an application which will be deployed to Google Cloud. Which Google service allows you to provide the encryption keys as part of your application's Google Cloud API calls? (Choose 1)
A. Google encryption by default
B. Scripted encryption keys (SEK)
C. Customer-supplied encryption keys (CSEK)
D. Customer-managed encryption keys (CMEK)
Feedback: Customer-supplied encryption keys give users more control over their keys, but with greater management complexity. With CSEK, users use their own AES-256-bit encryption keys. They are responsible for generating these keys.
Users are responsible for storing the keys and providing them as part of Google Cloud API calls.

You are migrating an application from your physical infrastructure where you are responsible for security, to a Google-managed services solution. Which layers of security are you now responsible for? (Choose 2)
A. Usage
B. Network
C. Content
D. Operations
E. Audit Logging
Feedback: Google handles many of the lower layers of security like physical security, disk encryption, and network integrity. The upper layers of the security stack - including the securing of data - remain the customers' responsibility.

You want to encrypt your data and utilize a managed service in addition to the standard encryption process. Which service can you choose that will manage your keys and provide asymmetric key support? (Choose 1)
A. App Engine
B. Identity-Aware Proxy
C. Cloud Key Management Service
D. Cloud Identity and Access Management
Feedback: Cloud Key Management Service, or Cloud KMS, automates and simplifies the generation and management of encryption keys. The keys are managed by the customer and never leave the cloud.

You want to define a custom IAM role named instanceOperator. The role will only be able to start and stop instances, not delete them. Which level can the role be applied at? (Choose 1)
A. Folder
B. Resource

C. Organization
D. Compute Engine
Feedback: Custom roles can only be applied at the project and organization levels.

You want to map users and groups from your Microsoft Active Directory domain to a Cloud Identity domain. What action should you take to achieve this? (Choose 1)
A. Sync users and groups using Cloud Directory Sync.
B. Sync users and groups using Google Cloud Connector.
C. Enable Azure Active Directory Connect synchronization.
D. Enable LDAP Directory Synchronization for Active Directory.
Feedback: Cloud Directory Sync synchronizes users and groups from an existing Active Directory or LDAP system mapping the users and groups in a Cloud Identity domain.

You have five virtual machines in a project utilizing service accounts. You need to change the permissions of a service account from objectViewer to Editor on two virtual machines. What action should you take to accomplish this? (Choose 1)
A. Apply a basic role to the VMs.
B. Modify the service account permission.
C. Move the virtual machines to a new project.
D. Recreate the virtual machines and apply the new permissions.
Feedback: You can grant virtual machines different identities. This makes it easier to manage different permissions across your applications. You also can change the permissions of the service accounts without having to recreate the VMs.

[User Authentication: Identity-Aware Proxy] You want to control access to your cloud applications running on Google Cloud. You want to intercept web requests sent to your application, authenticate the user making the request and only let through the requests if they come from a user you authorize. What solution can you deploy? (Choose 1)
A. Apigee
B. App Engine
C. Cloud Policy Intelligence
D. Identity-Aware Proxy
Feedback: Identity-Aware Proxy (IAP) controls access to your cloud applications and VMs running on Google Cloud. IAP works by verifying user identity and context of the request to determine if a user should be allowed to access an application or a VM.

[User Authentication: Identity-Aware Proxy] You are configuring the Identity-Aware Proxy using the Cloud Console. This is the first time you have enabled an authentication option for this project. What action must you take? (Choose 1)
A. Configure Domain verification.
B. Configure a HTTPS Load Balancer.
C. Configure the OAuth consent screen.
D. Configure the Application privacy policy.

Feedback: The first time you enabled an authentication option for a project, you will see a message to configure your OAuth consent screen before you can use the Identity Aware-Proxy.

[User Authentication: Identity-Aware Proxy] You want to ensure that the user identity information your app receives is valid so that you can prevent spoofing even if the Identity Aware-Proxy is bypassed. What can you configure in order to achieve this? (Choose 1)

A. Request headers

B. Assertion headers

C. Cryptographic verification

D. Two-factor authentication

Feedback: If there is a risk of the Identity Aware-Proxy (IAP) being turned off or bypassed, your app can check to make sure the identity information it receives is valid. This uses a third web request header added by IAP, called X-Goog-IAP-JWT-Assertion. The value of the header is a cryptographically signed object that also contains the user identity data. Your application can verify the digital signature and use the data provided in this object to be certain that it was provided by IAP without alteration.

LAB CHALLENGE

Welcome to Cloud Shell! Type "help" to get started.
Your Cloud Platform project in this session is set to qwiklabs-gcp-00-2a199bbf8678.
Use "gcloud config set project [PROJECT_ID]" to change to a different project.
student_03_a1bc68830cb6@cloudshell:~ (qwiklabs-gcp-00-2a199bbf8678)$ **gcloud auth list**
Credentialed Accounts

ACTIVE: *
ACCOUNT: student-03-a1bc68830cb6@qwiklabs.net

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

student_03_a1bc68830cb6@cloudshell:~ (qwiklabs-gcp-00-2a199bbf8678)$ **gcloud config get-value compute/region**
gcloud config get-value compute/zone
Your active configuration is: [cloudshell-4276]
(unset)
Your active configuration is: [cloudshell-4276]
(unset)
student_03_a1bc68830cb6@cloudshell:~ (qwiklabs-gcp-00-2a199bbf8678)$ **gcloud config set compute/region Region**
WARNING: Property validation for compute/region was skipped.
Updated property [compute/region].

student_03_a1bc68830cb6@cloudshell:~ (qwiklabs-gcp-00-2a199bbf8678)$ **gcloud config set compute/zone ZONE**

WARNING: Property validation for compute/zone was skipped.

Updated property [compute/zone].

student_03_a1bc68830cb6@cloudshell:~ (qwiklabs-gcp-00-2a199bbf8678)$ ^C

student_03_a1bc68830cb6@cloudshell:~ (qwiklabs-gcp-00-2a199bbf8678)$ gcloud config set compute/region REGION

WARNING: Property validation for compute/region was skipped.

Updated property [compute/region].

student_03_a1bc68830cb6@cloudshell:~ (qwiklabs-gcp-00-2a199bbf8678)$ ^C

student_03_a1bc68830cb6@cloudshell:~ (qwiklabs-gcp-00-2a199bbf8678)$ gcloud config get-value compute/region

gcloud config get-value compute/zone

Your active configuration is: [cloudshell-4276]

REGION

Your active configuration is: [cloudshell-4276]

ZONE

student_03_a1bc68830cb6@cloudshell:~ (qwiklabs-gcp-00-2a199bbf8678)$ ^C

student_03_a1bc68830cb6@cloudshell:~ (qwiklabs-gcp-00-2a199bbf8678)$ **export INSTANCE=nucleus-jumphost-868**

student_03_a1bc68830cb6@cloudshell:~ (qwiklabs-gcp-00-2a199bbf8678)$ gcloud compute instances create $INSTANCE \

   --zone= ZONE \

   --machine-type=e2-micro \

   --image-project=debian-cloud \

   --image-family=debian-10

ERROR: (gcloud.compute.instances.create) unrecognized arguments: ZONE

To search the help text of gcloud commands, run:

  gcloud help -- SEARCH_TERMS

student_03_a1bc68830cb6@cloudshell:~ (qwiklabs-gcp-00-2a199bbf8678)$ gcloud config set compute/region us-central1

gcloud config set compute/zone us-central1-a

WARNING: Property validation for compute/region was skipped.

Updated property [compute/region].

WARNING: Property validation for compute/zone was skipped.

Updated property [compute/zone].

student_03_a1bc68830cb6@cloudshell:~ (qwiklabs-gcp-00-2a199bbf8678)$ **export REGION=us-central1**

export ZONE=us-central1-a

student_03_a1bc68830cb6@cloudshell:~ (qwiklabs-gcp-00-2a199bbf8678)$ gcloud compute instances create $INSTANCE \

   --zone=$ZONE \

   --machine-type=e2-micro \

```
    --image-project=debian-cloud \
    --image-family=debian-10
ERROR: (gcloud.compute.instances.create) Could not fetch resource:
 - The resource 'projects/debian-cloud/zones/us-central1-a/imageFamilyViews/debian-10' was
not found

student_03_a1bc68830cb6@cloudshell:~ (qwiklabs-gcp-00-2a199bbf8678)$ gcloud compute
instances create $INSTANCE \
    --zone=$ZONE \
    --machine-type=e2-micro \
    --image-family=debian-11 \
    --image-project=debian-cloud
ERROR: (gcloud.compute.instances.create) Could not fetch resource:
---
code: ZONE_RESOURCE_POOL_EXHAUSTED
errorDetails:
- help:
    links:
    - description: Troubleshooting documentation
      url: https://cloud.google.com/compute/docs/resource-error
- localizedMessage:
    locale: en-US
    message: A e2-micro VM instance is currently unavailable in the us-central1-a
      zone. Alternatively, you can try your request again with a different VM hardware
      configuration or at a later time. For more information, see the troubleshooting
      documentation.
- errorInfo:
    domain: compute.googleapis.com
    metadatas:
      attachment: ''
      vmType: e2-micro
      zone: us-central1-a
      zonesAvailable: ''
    reason: resource_availability
message: The zone 'projects/qwiklabs-gcp-00-2a199bbf8678/zones/us-central1-a' does
  not have enough resources available to fulfill the request.  Try a different zone,
   or try again later.

student_03_a1bc68830cb6@cloudshell:~ (qwiklabs-gcp-00-2a199bbf8678)$ ^C
student_03_a1bc68830cb6@cloudshell:~ (qwiklabs-gcp-00-2a199bbf8678)$ gcloud config set
compute/zone us-central1-b
WARNING: Property validation for compute/zone was skipped.
Updated property [compute/zone].
```

student_03_a1bc68830cb6@cloudshell:~ (qwiklabs-gcp-00-2a199bbf8678)$ gcloud compute instances create $INSTANCE   --zone=$ZONE   --machine-type=e2-micro --image-family=debian-11   --image-project=debian-cloud
ERROR: (gcloud.compute.instances.create) Could not fetch resource:
---
code: ZONE_RESOURCE_POOL_EXHAUSTED
errorDetails:
- help:
    links:
    - description: Troubleshooting documentation
      url: https://cloud.google.com/compute/docs/resource-error
- localizedMessage:
    locale: en-US
    message: A e2-micro VM instance is currently unavailable in the us-central1-a
      zone. Alternatively, you can try your request again with a different VM hardware
      configuration or at a later time. For more information, see the troubleshooting
      documentation.
- errorInfo:
    domain: compute.googleapis.com
    metadatas:
      attachment: ''
      vmType: e2-micro
      zone: us-central1-a
      zonesAvailable: ''
    reason: resource_availability
message: The zone 'projects/qwiklabs-gcp-00-2a199bbf8678/zones/us-central1-a' does
  not have enough resources available to fulfill the request. Try a different zone,
  or try again later.

student_03_a1bc68830cb6@cloudshell:~ (qwiklabs-gcp-00-2a199bbf8678)$ export ZONE=us-central1-b
student_03_a1bc68830cb6@cloudshell:~ (qwiklabs-gcp-00-2a199bbf8678)$ **gcloud compute instances create $INSTANCE   --zone=$ZONE   --machine-type=e2-micro --image-family=debian-11   --image-project=debian-cloud**
Created [https://www.googleapis.com/compute/v1/projects/qwiklabs-gcp-00-2a199bbf8678/zones/us-central1-b/instances/nucleus-jumphost-868].
NAME: nucleus-jumphost-868
ZONE: us-central1-b
MACHINE_TYPE: e2-micro
PREEMPTIBLE:
INTERNAL_IP: 10.128.0.2
EXTERNAL_IP: 34.16.11.126
STATUS: RUNNING

```
student_03_a1bc68830cb6@cloudshell:~ (qwiklabs-gcp-00-2a199bbf8678)$ export
ZONE=us-central1-c
student_03_a1bc68830cb6@cloudshell:~ (qwiklabs-gcp-00-2a199bbf8678)$ gcloud compute
instances create $INSTANCE    --zone=$ZONE    --machine-type=e2-micro
--image-family=debian-11    --image-project=debian-cloud
Created
[https://www.googleapis.com/compute/v1/projects/qwiklabs-gcp-00-2a199bbf8678/zones/us-cen
tral1-c/instances/nucleus-jumphost-868].
NAME: nucleus-jumphost-868
ZONE: us-central1-c
MACHINE_TYPE: e2-micro
PREEMPTIBLE:
INTERNAL_IP: 10.128.0.3
EXTERNAL_IP: 34.69.57.201
STATUS: RUNNING
student_03_a1bc68830cb6@cloudshell:~ (qwiklabs-gcp-00-2a199bbf8678)$ ^C
```

```
student_03_a1bc68830cb6@cloudshell:~ (qwiklabs-gcp-00-2a199bbf8678)$ cat << EOF >
startup.sh
#! /bin/bash
apt-get update
apt-get install -y nginx
service nginx start
sed -i -- 's/nginx/Google Cloud Platform - "\$HOSTNAME"/'
/var/www/html/index.nginx-debian.html
EOF
student_03_a1bc68830cb6@cloudshell:~ (qwiklabs-gcp-00-2a199bbf8678)$ cat startup.sh
#! /bin/bash
apt-get update
apt-get install -y nginx
service nginx start
sed -i -- 's/nginx/Google Cloud Platform - "$HOSTNAME"/'
/var/www/html/index.nginx-debian.html
student_03_a1bc68830cb6@cloudshell:~ (qwiklabs-gcp-00-2a199bbf8678)$ gcloud compute
instance-templates create web-server-template \
   --metadata-from-file startup-script=startup.sh \
   --machine-type=e2-medium \
   --image-family=debian-11 \
   --image-project=debian-cloud
Created
[https://www.googleapis.com/compute/v1/projects/qwiklabs-gcp-00-2a199bbf8678/global/instanc
eTemplates/web-server-template].
```

NAME: web-server-template
MACHINE_TYPE: e2-medium
PREEMPTIBLE:
CREATION_TIMESTAMP: 2024-10-03T09:05:05.536-07:00
student_03_a1bc68830cb6@cloudshell:~ (qwiklabs-gcp-00-2a199bbf8678)$ gcloud compute
instance-groups managed create web-server-group \
    --base-instance-name web-server \
    --size 2 \
    --template web-server-template \
    --zone=$ZONE
Created
[https://www.googleapis.com/compute/v1/projects/qwiklabs-gcp-00-2a199bbf8678/zones/us-cen
tral1-c/instanceGroupManagers/web-server-group].
NAME: web-server-group
LOCATION: us-central1-c
SCOPE: zone
BASE_INSTANCE_NAME: web-server
SIZE: 0
TARGET_SIZE: 2
INSTANCE_TEMPLATE: web-server-template
AUTOSCALED: no
student_03_a1bc68830cb6@cloudshell:~ (qwiklabs-gcp-00-2a199bbf8678)$ gcloud compute
firewall-rules create accept-tcp-rule-505 \
    --allow tcp:80 \
    --target-tags http-server \
    --description "Allow HTTP traffic" \
    --direction INGRESS \
    --network default
Creating firewall...working..Created
[https://www.googleapis.com/compute/v1/projects/qwiklabs-gcp-00-2a199bbf8678/global/firewall
s/accept-tcp-rule-505].
Creating firewall...done.
NAME: accept-tcp-rule-505
NETWORK: default
DIRECTION: INGRESS
PRIORITY: 1000
ALLOW: tcp:80
DENY:
DISABLED: False
student_03_a1bc68830cb6@cloudshell:~ (qwiklabs-gcp-00-2a199bbf8678)$ gcloud compute
health-checks create http http-basic-check \
    --port 80

Created
[https://www.googleapis.com/compute/v1/projects/qwiklabs-gcp-00-2a199bbf8678/global/health
Checks/http-basic-check].
NAME: http-basic-check
PROTOCOL: HTTP
student_03_a1bc68830cb6@cloudshell:~ (qwiklabs-gcp-00-2a199bbf8678)$ gcloud compute
instance-groups managed set-named-ports web-server-group \
   --named-ports http:80 \
   --zone=$ZONE
Updated
[https://www.googleapis.com/compute/v1/projects/qwiklabs-gcp-00-2a199bbf8678/zones/us-cen
tral1-c/instanceGrou