

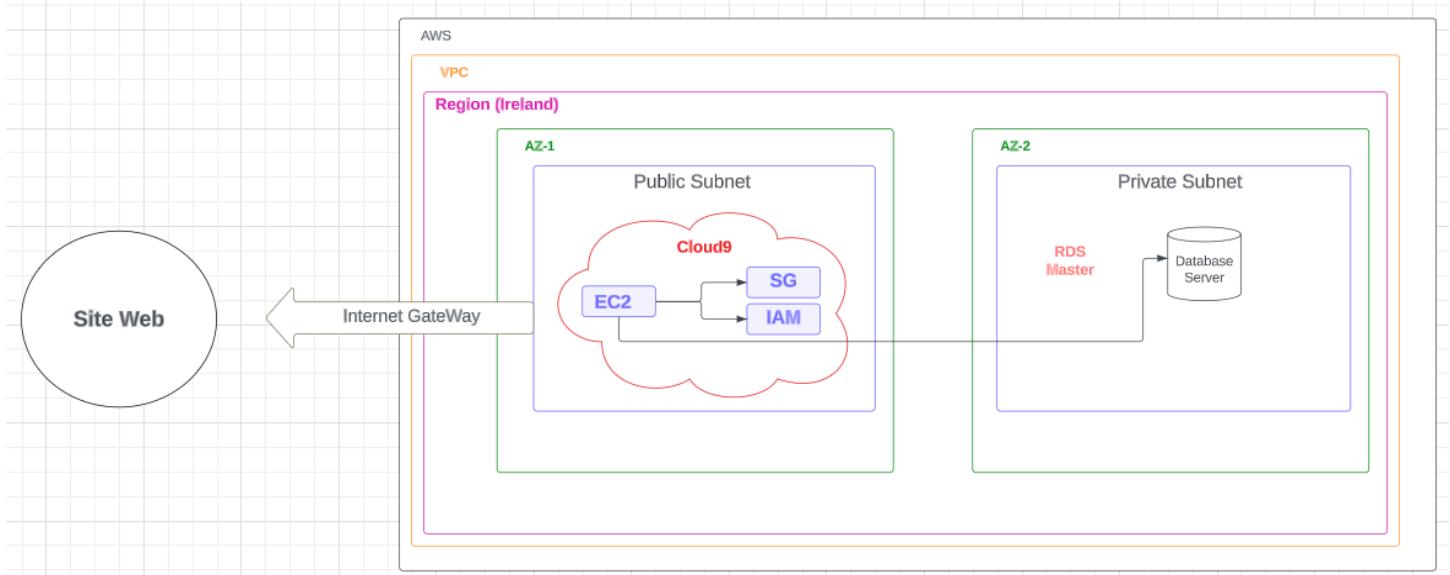
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M1 DT

# Cloud and Big Data Architectures

Mister Jean-Pascal MEWENEMESSE  
[AWS Cloud & Big Data Architectures - Project](#)

Design an Architecture diagram for your Infrastructure solution. We use LucidChart.



Building project on AWS. We are following this different step.

## VPC Creation

Name	VPC ID	State	IPv4 CIDR
vpc-00ebc1e9bd976ea8c	vpc-00ebc1e9bd976ea8c	Available	172.31.0.0/16
<b>project-Cloud-vpc</b>	vpc-0dab9eda2d2b3dadb	Available	10.0.0.0/16

VPC ID	State	DNS hostnames	DNS resolution
vpc-0dab9eda2d2b3dadb	Available	Enabled	Enabled
Tenancy	DHCP option set	Main route table	Main network ACL
Default	dopt-0163eecab031f3d6c	rtb-0843bdd664ff19f5f	acl-0cc29159c0ecc0715
Default VPC	IPv4 CIDR	IPv6 pool	IPv6 CIDR
No	10.0.0.0/16	-	-

## Subnet Creation

The screenshot shows the AWS VPC Subnets page. The left sidebar is collapsed, and the main area displays a table titled "Subnets (5) Info". The table has columns for Name, Subnet ID, State, and VPC. The subnets listed are:

Name	Subnet ID	State	VPC
project-Cloud-subnet-public-eu-west-1b	subnet-0d982b7c7c4e29487	Available	vpc-0dab9eda2d2b3dad1
project-Cloud-subnet-private1-eu-west...	subnet-0efd951495791bd39	Available	vpc-0dab9eda2d2b3dad1
-	subnet-03f4d771eb01d8259	Available	vpc-00ebc1e9bd976ea8c
-	subnet-084c9083a225c7b5c	Available	vpc-00ebc1e9bd976ea8c
-	subnet-0c5d869c2dea3f80f	Available	vpc-00ebc1e9bd976ea8c

Below the table, there is a section titled "Select a subnet" with three icons: a square, a rectangle, and a circle.

## Environnement creation on Cloud9

The screenshot shows the AWS Cloud9 IDE interface. The top navigation bar includes File, Edit, Find, View, Go, Run, Tools, Window, and Support. The main area features a "Welcome" tab and a "Developer Tools" section. A large banner at the top says "AWS Cloud9 Welcome to your development environment". Below the banner, it states: "AWS Cloud9 allows you to write, run, and debug your code with just a browser. You can tour the IDE, write code for AWS Lambda and Amazon API Gateway, share your IDE with others in real time, and much more." A "Getting started" button is visible. At the bottom, there is a terminal window titled "bash - \*ip-10-0-0-65.eu-w" showing the command "ec2-user:~/environment \$". The bottom of the screen shows the Windows taskbar with various pinned icons.

AWS Cloud9

Environments

Documentation

CloudShell Feedback Language

CloudShell Search

Services

S3 EC2 IAM Cloud9 VPC RDS QuickSight

Search [Alt+S]

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**AWS Cloud9 > Environments**

**Environments (1)**

Delete View details Open in Cloud9 Create environment

My environments

Name	Cloud9 IDE	Environment type	Connection	Permission	Owner ARN
ideproject	Open	EC2 instance	AWS Systems Manager (SSM)	Owner	arn:aws:iam::524220281166:root

CloudShell Search

CloudShell Feedback Language

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13:02 21/07/2023

## Instance :

New EC2 Experience Tell us what you think

EC2 Dashboard

EC2 Global View

Events

Instances

Instances

Instance Types

Launch Templates

Spot Requests

Savings Plans

Reserved Instances

Dedicated Hosts

Scheduled Instances

Capacity Reservations

Instances

CloudShell Feedback Language

CloudShell Search

Services

S3 EC2 IAM Cloud9 VPC RDS QuickSight

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**Instances (4) Info**

Find instance by attribute or tag (case-sensitive)

Name	Instance ID	Instance state	Instance type	Status check	Alarm status
aws-cloud9-En...	i-04df9f30a7703ea27	Terminated	t2.micro	-	No alarms +
aws-cloud9-En...	i-038ce2f547bcd37b	Terminated	t2.micro	-	No alarms +
aws-cloud9-En...	i-051a536c902a59ada	Terminated	t2.micro	-	No alarms +
aws-cloud9-id...	i-0e85f3fb0075e0cd	Running	t2.micro	2/2 checks passed	No alarms +

Select an instance

CloudShell Search

CloudShell Feedback Language

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13:03 21/07/2023

## Security Groups :

The screenshot shows the AWS VPC console with a success message: "Inbound security group rules successfully modified on security group (sg-0ae6e275f56852733 | aws-cloud9-ideproj... 3ec8c1d4141f4b0286fa1554b6de3c9f-InstanceSecurityGroup-BTTIZIVJH56) Details". Below this, a table lists security groups:

Name	Security group ID	Security group name	VPC ID
-	sg-0b6c96a11ccb90647	default	vpc-00ebc1e9bd976ea8c
<b>aws-cloud9-ideproj...</b>	<b>sg-0ae6e275f56852733</b>	<b>aws-cloud9-ideproj...</b>	<b>vpc-0dab9eda2d2b3dadb</b>
-	sg-06b99a51d98277d0	default	vpc-0dab9eda2d2b3dadb

Below the table, a note says: "sg-0ae6e275f56852733 - aws-cloud9-ideproj-3ec8c1d4141f4b0286fa1554b6de3c9f-InstanceSecurityGroup-BTTIZIVJH56". The interface includes tabs for Details, Inbound rules, Outbound rules, and Tags.

## MySQL DataBase :

Endpoint : database-1.cb8paa04j2ht.eu-west-1.rds.amazonaws.com

The screenshot shows the AWS RDS console with a message: "Consider creating a Blue/Green Deployment to minimize downtime during upgrades". Below this, a table lists databases:

DB identifier	Status	Role	Engine	Region & AZ	Size	Actions	CPU	Current activity
database-1	Available	Instance	MariaDB	eu-west-1b	db.t3.micro	-	-	-

The interface includes tabs for Group resources, Modify, Actions, Restore from S3, and Create database. The bottom status bar shows "CloudShell", "Feedback", "Language", "21°C Eclaircies", and the date "21/07/2023".

## Connexion between database and instance :

Step 1  
Set up EC2 connection

Step 2  
Review and confirm

Select EC2 instance

Database database-1

EC2 instance

Choose the EC2 instance to connect to this database. Only EC2 instances in the same VPC as the database are shown. If no EC2 instances in the same VPC are available, you can create a new EC2 instance.

i-0e85f3fb0075e0cd  
aws-cloud9-ideproject-3ec8c1d4141f4b0286fa1554b6de3c9f eu-west-1b

Create EC2 instance

Cancel Continue

CloudShell Feedback Language 21°C Ciel couvert Search Services Search [Alt+S] Ireland Alette Vannier ...

Connection setup successfully for RDS database database-1 and EC2 instance i-0e85f3fb0075e0cd

RDS Databases

Consider creating a Blue/Green Deployment to minimize downtime during upgrades

You may want to consider using Amazon RDS Blue/Green Deployments and minimize your downtime during upgrades. A Blue/Green Deployment provides a staging environment for changes to production databases. [RDS User Guide](#) [Aurora User Guide](#)

Databases (1)

DB identifier	Status	Role	Engine	Region & AZ	Size	Actions	CPU	Current
database-1	Available	Instance	MariaDB	eu-west-1b	db.t3.micro	4 Actions	2.73%	

Group resources Modify Actions Restore from S3 Create database

Filter by databases

CloudShell Feedback Language 21°C Ciel couvert Search Services Search [Alt+S] Ireland Alette Vannier ...

Command in the environment ;

https://eu-west-1.console.aws.amazon.com/cloud9/ide/3ec8c1d4141f4b0286fa1554b6de3c9f

```

File Edit Find View Go Run Tools Window Support Preview Run
AWS ideproject - /home
Go to Anything (Ctrl-P)
.c9 README.md
Welcome
root@ip-10-0-0-65:/home x Immediate x +
inflating: /var/www/html/mobile.php
inflating: /var/www/html/query.php
[root@ip-10-0-0-65 html]# chown -R ec2-user:ec2-user /var/www/html
[root@ip-10-0-0-65 html]# mysql -h database-1.cb8paa04j2ht.eu-west-1.rds.amazonaws.com -P 3306 -u admin -p DatabaseCloud < Countrydatadump.sql
bash: Countrydatadump.sql: No such file or directory
[root@ip-10-0-0-65 html]# ls
aws.php gdpr.php index.php Logo.png mobile.php population.php query3.php Shirley.jpeg
Example.zip get-parameters.php lifeexpectancy.php menu.php mortality.php query2.php query.php style.css
[root@ip-10-0-0-65 html]# cd ..
[root@ip-10-0-0-65 www]# cd ..
[root@ip-10-0-0-65 var]# cd ..
[root@ip-10-0-0-65/]# ls
bin boot dev etc home lib lib64 local media mnt opt proc root run sbin srv sys tmp usr var
[root@ip-10-0-0-65/]# cd home/
[root@ip-10-0-0-65 home]# cd ec2-user/
[root@ip-10-0-0-65 ec2-user]# mysql -h database-1.cb8paa04j2ht.eu-west-1.rds.amazonaws.com -P 3306 -u admin -p DatabaseCloud < Countrydatadump.sql
Enter password:
[root@ip-10-0-0-65 ec2-user]# mysql -h database-1.cb8paa04j2ht.eu-west-1.rds.amazonaws.com -P 3306 -u admin -p
Enter password:
Welcome to the MariaDB monitor. Commands end with ; or \g.
Your MariaDB connection id is 79
Server version: 10.6.14-MariaDB managed by https://aws.amazon.com/rds/
Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

```

✓ CodeWhisperer AWS profile default

21°C Ciel couvert 13:41 21/07/2023

The site :

Not secure | 52.214.157.52

# Example Social Research Organization

[About Us](#) [Contact Us](#) [Query](#)

Welcome to our data query site. You can get data from countries all over the world to use in your research.

We provide data for a variety of areas including basic demographics and development statistics.

## About Us



21°C Ciel couvert 13:37 21/07/2023

Show database:

The screenshot shows the AWS Cloud9 IDE interface. In the center, there is a terminal window titled "Welcome" with the command "root@ip-10-0-0-65:/home" and the output of a MySQL query:

```
root@ip-10-0-0-65:/home> select * from countrydata_final;
+-----+-----+-----+-----+-----+-----+-----+-----+
| name | mobilephones | mortalityunder5 | healthexpenditurepercapita | healthexpenditurepercentGDP | population |
|-----+-----+-----+-----+-----+-----+-----+-----+
| Afghanistan | 5771984 | 50 | 46 | 2461666315 | 150 | 11 | 9 | 26697430 | |
| Albania | 1280964 | 17 | 29791 | 74 | 3686649387 | 29 | 75 | 6 | 3071856 |
| Algeria | 18259229 | 21 | 86000 | 49 | 54790058957 | 78 | 63 | 3 | 30533827 |
| American Samoa | 51171 | 0 | 1992 | 0 | 0 | 0 | 0 | 57625 |
| Andorra | 59722 | 11 | 23543 | 0 | 1133644295 | 5 | 1289 | 8 | 64634 |
| Angola | 6823923 | 50 | 25886 | 46 | 9129180361 | 200 | 15 | 2 | 13926373 |
| Antigua and Barbuda | 24928 | 21 | 21000 | 0 | 882526701 | 35 | 411 | 5 | 77656 |
| Argentina | 33274569 | 19 | 6487950 | 74 | 284284000000 | 20 | 689 | 9 | 36930709 |
| Armenia | 2002540 | 13 | 17486 | 71 | 1911563665 | 33 | 41 | 7 | 3076098 |
| Aruba | 15000 | 0 | 15000 | 15000 | 0 | 0 | 0 | 90271 |
+-----+-----+-----+-----+-----+-----+-----+-----+
```

The terminal also shows "Database changed". The status bar at the bottom indicates "CodeWhisperer AWS profile.default" and the date "21/07/2023".

## Add parameter :

The screenshot shows the AWS Systems Manager Parameters page. A parameter named "/example/database" is selected. The "Overview" tab is active.

Name	Description
/example/database	-
Tier	Data type
Standard	text
Type	Last modified user
String	arn:aws:iam::524220281166:root
Last modified date	Version
Fri, 21 Jul 2023 11:32:53 GMT	1
Value	DatabaseCloud

The status bar at the bottom indicates "CloudShell Feedback Language" and the date "21/07/2023".

The screenshot shows the AWS Systems Manager Parameter Store interface. At the top, there's a navigation bar with tabs for 'My parameters' (which is selected), 'Public parameters', and 'Settings'. Below this is a table titled 'My parameters' with columns: Name, Tier, Type, and Last modified. The table lists four parameters:

	Name	Tier	Type	Last modified
<input type="checkbox"/>	/example/database	Standard	String	Fri, 21 Jul 2023 11:32:53 GMT
<input type="checkbox"/>	/example/endpoint	Standard	String	Fri, 21 Jul 2023 11:31:21 GMT
<input type="checkbox"/>	/example/password	Standard	String	Fri, 21 Jul 2023 11:32:29 GMT
<input type="checkbox"/>	/example/username	Standard	String	Fri, 21 Jul 2023 11:32:05 GMT

At the bottom of the page, there's a footer with links for CloudShell, Feedback, Language, and various AWS services like CloudWatch Metrics, Lambda, and CloudWatch Logs. The date and time shown are 21/07/2023 at 13:34.

## Modify IAM role :

The screenshot shows the 'Modify IAM role' dialog in the AWS EC2 Instances section. The instance ID 'i-0e85f3fb0075e0cd' is selected. The dialog has fields for 'Instance ID' (set to 'i-0e85f3fb0075e0cd') and 'IAM role' (a dropdown menu with 'role' selected). There are buttons for 'Cancel' and 'Update IAM role' (which is highlighted with a yellow box).

At the bottom of the dialog, there's a footer with links for CloudShell, Feedback, Language, and various AWS services like CloudWatch Metrics, Lambda, and CloudWatch Logs. The date and time shown are 21/07/2023 at 13:35.

## Put query :

← → ⌛ Not secure | 52.214.157.52/query.php

## Example Social Research Organization

### Country Data Query Page

[Home](#)

Please select which query you want to run.

Population

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Have a result :

← → ⌛ Not secure | 52.214.157.52/query2.php

Pick another query	Country Name	Population	Urban Population
	Afghanistan	26697430	5771984
	Albania	3071856	1280964
	Algeria	30533827	18259229
	American Samoa	57625	51171
	Andorra	64634	59722
	Angola	13926373	6823923
	Antigua and Barbuda	77656	24928
	Argentina	36930709	33274569
	Armenia	3076098	2002540
	Aruba	90271	42157
	Australia	19153000	16701416
	Austria	8011566	5271610
	Azerbaijan	8048600	4120883
	Bahamas, The	297651	244074
	Bahrain	638193	564163
	Bangladesh	129592275	30583777
	Barbados	267511	97106
	Belarus	10005000	6993495
	Belgium	10251250	9953964
	Belize	249800	119404
	Benin	6517810	2496321
	Bermuda	62100	62100
	Bhutan	571262	145101
	Bolivia	8307248	5133879
	Bosnia and Herzegovina	3693698	1595678

21°C Ciel couvert 13:39 21/07/2023

## IAM quizz

1- Which statement describes AWS Identity and Access Management (IAM) users?

Option 1

2- How can you grant the same level of permissions to multiple users within an account?

Option 1

3- Which statements describes AWS Identity and Access Management (IAM) roles?

Option 2 and 4

4- Which statement describes a resource-based policy?

Option 1

5- How does AWS Identity and Access Management (IAM) evaluate a policy?

Option 2

6- A team of developers needs access to several services and resources in a virtual private cloud (VPC) for 9 months. How can you use AWS Identity and Access Management (IAM) to enable access for them?

Option 2

7- How does identity federation increase security for an application that is built in Amazon Web Services (AWS)?

Option 1

### **Network Quizz**

1- Which definition describes a virtual private cloud (VPC)?

Option 2

2- A company's VPC has the CIDR block 172.16.0.0/21 (2048 addresses). It has two subnets (A and B). Each subnet must support 100 usable addresses now, but this number is expected to rise to as most 254 usable addresses soon. Which subnet addressing scheme meets the requirements and follows AWS best practices?

Option 4

3- Which combination of actions enables direct internet access for IPv4 hosts in a virtual private cloud (VPC)?

The three options that enable direct internet access for IPv4 hosts in a Virtual Private Cloud (VPC) are:

Option 1, Option 2 and Option 6

4- Several EC2 instances launch in a virtual private cloud (VPC) that has internet access. These instances should not be accessible from the internet, but they must be able to download updates from the internet. How should the instances launch?

Option 4

## IAM Policy Evaluation

### 1. Evaluate IAM policies

This IAM policy allows the specified user or role to:

- Run and terminate EC2 instances in the "us-east-1" region of AWS account "123456789012".
- Obtain (read) and place (download) objects in the "example-bucket" in any S3 bucket.

However, it is important to note that the policy grants very broad permissions to perform these actions. Depending on the use case, it may be safer to limit authorized actions to specific EC2 instances and S3 buckets rather than authorizing actions on all resources in regions.

### 2. What actions are allowed for EC2 instances and S3 objects based on this policy? What specific resources are included?

This IAM policy allows the specified user or role to :

- Describe VPC resources in the "us-west-2" region.
- Describe subnet resources in the "us-west-2" region.
- Describe security group resources in the "us-west-2" region.

Actions are allowed for all VPCs, subnets and security groups in the specified region ("us-west-2"). It is important to note that the policy only allows "description" actions and does not grant permissions to create, modify or delete VPC, subnet or security group resources. The policy is specifically designed to allow read-only access to VPC information in the "us-west-2" region.

### 3. Under what condition does this policy allow access to VPC-related information? Which AWS region is specified?

This IAM policy allows the specified user or role to :

- Read (Get) objects with the prefixes "documents/" and "images/" in the "example basket".
- Write (put) objects with the prefixes "documents/" and "images/" in the "example basket".
- List the contents of the "examples basket".

It's important to note that the policy only grants read and write access to specific objects in the example basket? according to their prefixes. Access to other objects in the basket is denied.

4. What actions are allowed on the "example-bucket" and its objects based on this policy? What specific prefixes are specified in the condition?

The policy is limited to IAM actions and has no relation to S3 buckets, objects or any other AWS service. It is specific to IAM actions and only authorizes the creation and deletion of IAM users for the specified AWS account ("123456789012").

5. What actions are allowed for IAM users based on this policy? How are the resource ARNs constructed?

This statement lets the user list and retrieve any object that is in the Resource element. This Resource is "\*" (which means "all resources").

---

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Condition": {
        "StringEquals": {
          "ec2:InstanceType": ["t2.micro", "t2.small"]
        }
      },
      "Resource": "arn:aws:ec2:*:*:instance/*",
      "Action": ["ec2:RunInstances", "ec2:StartInstances"],
      "Effect": "Deny"
    }
  ]
}
```

6.

- a. Which AWS service does this policy grant you access to?

This policy allows you to grant or deny access to certain specific actions on EC2 instances, depending on their t2.micro and t2.small instance type.

- b. Does it allow you to create an IAM user, group, policy, or role?

Note this statement has action "iam:Get\*", these actions only retrieve information, and do not create, modify or delete IAM entities. To create, modify or delete entities, other actions such as "iam:Create\*", "iam:Update\*", "iam:Delete\*" are required.

c. What actions does the policy allow?

"iam:GetUser" : Permet de récupérer des informations sur un utilisateur IAM spécifique, telles que son nom, son identifiant, ses groupes d'appartenance, etc.

"iam:GetGroup" : Permet de récupérer des informations sur un groupe IAM spécifique, comme son nom, son identifiant, ses membres, etc.

"iam:GetPolicy" : Autorise la récupération des détails d'une politique IAM spécifique, tels que son nom, son document JSON (définissant les autorisations) et ses informations d'attachement aux groupes, utilisateurs ou rôles IAM.

Say that the policy included an additional statement object, like this example:

```
{  
    "Effect": "Allow",  
    "Action": "ec2:/*"  
}
```

d. How would the policy restrict the access granted to you by this additional statement?

This new declaration would grant full access to all EC2 resources without any restrictions. The entity benefiting from this policy would be able to create, start, stop, terminate, modify and perform all other possible actions in EC2.

e. If the policy included both the statement on the left and the statement in question 2, could you terminate an m3.xlarge instance that existed in the account?

Yes

## Big Data - Data Visualization With AWS QuickSight

The screenshot illustrates the AWS QuickSight interface, divided into two main sections: Data Upload and Visualization Creation.

**Data Upload Section:**

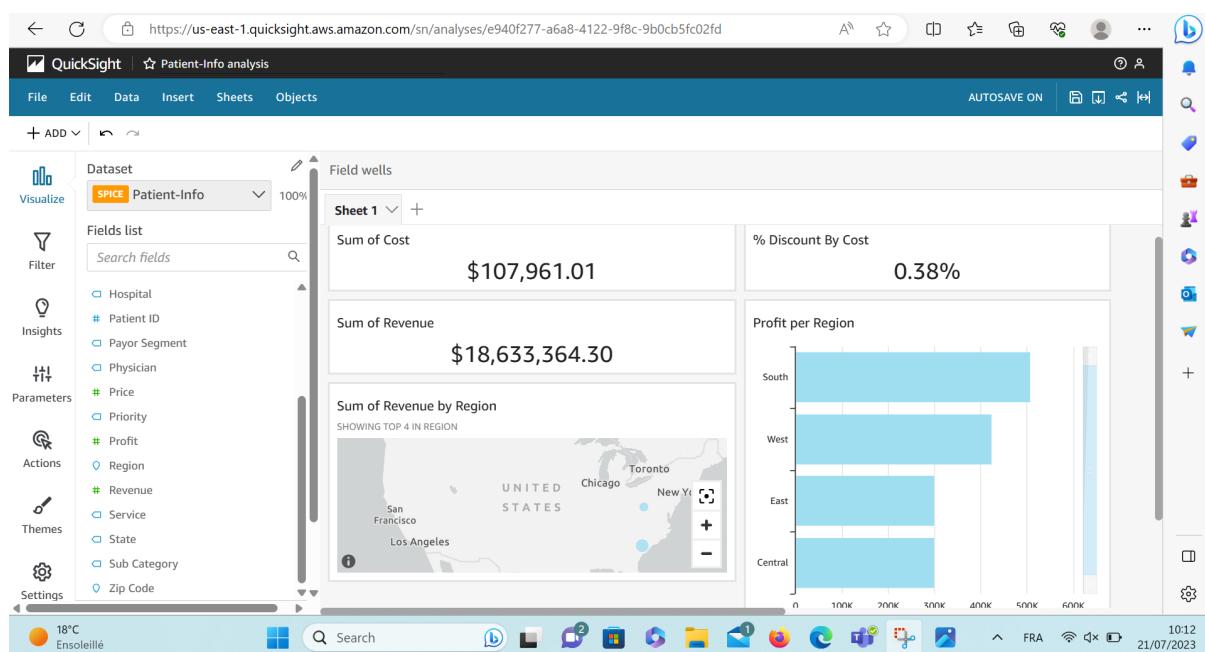
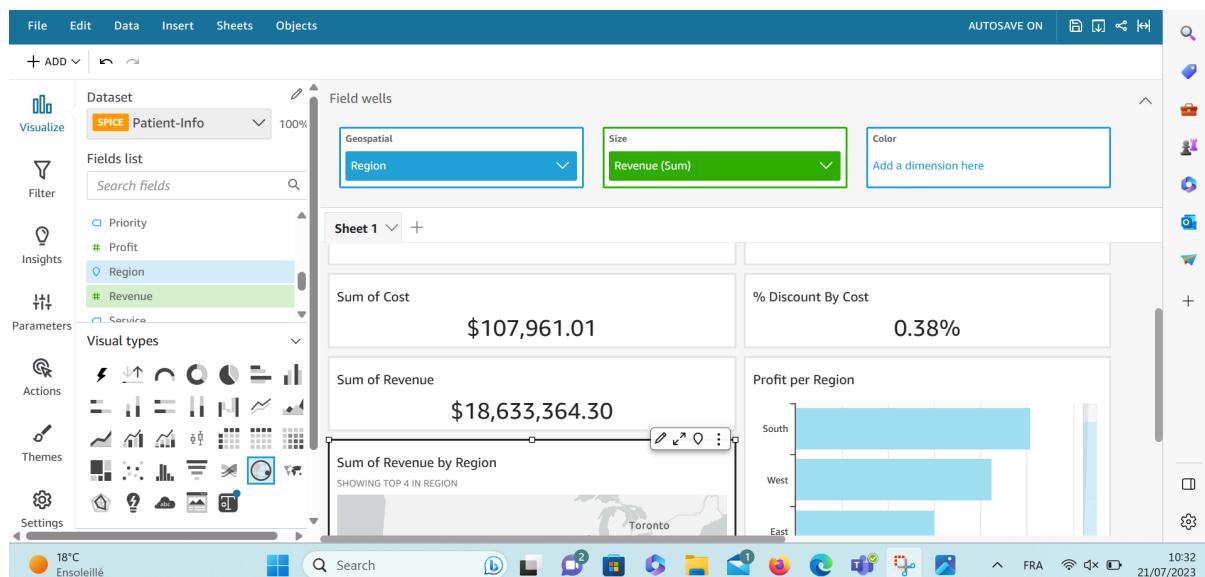
- Confirm file upload settings:** A modal window titled "Confirm file upload settings" displays the contents of a CSV file named "Patient-Info.csv". The file contains the following data:

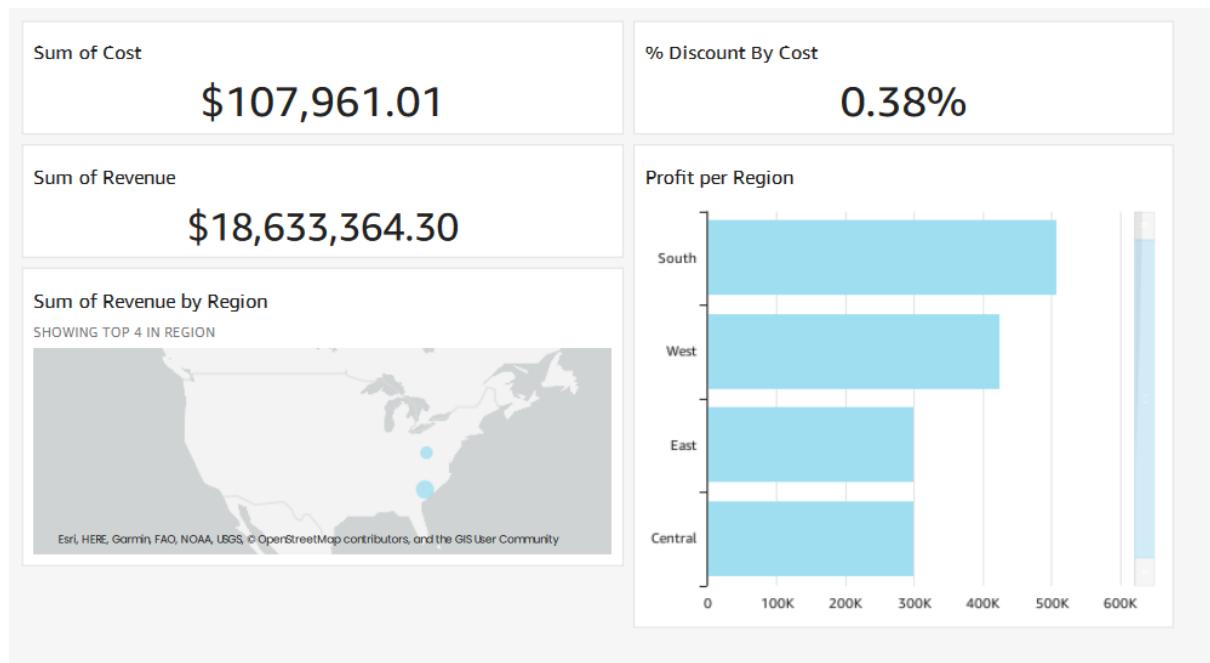
Patient ID	Admit Date	Discharge ...	Priority	Hospital	Profit
3	2016-10-14...	2016-10-21...	Low	North Hospital	-213.00
6	2018-02-20...	2018-02-21...	Not Specified	North Hospital	-4.64
32	2017-07-15...	2017-07-16...	High	North Hospital	-128.00
32	2017-07-15...	2017-07-16...	High	South Hospital	-174.00
32	2017-07-15...	2017-07-17...	High	North Hospital	-85.10

- File Upload Options:** Includes "Upload a file (.csv, .tsv, .clf, .elf, .xlsx, .json)" and "S3".
- Next Step:** Buttons for "Edit settings and prepare data" and "Next".

**Visualization Creation Section:**

- Dataset Selection:** "SPICE Patient-Info" is selected.
- Field Wells:** Y axis is set to "Region" and Value is "Profit (Sum)".
- Visuals:** Three cards are displayed:
  - Sum of Cost:** \$107,961.01
  - Sum of Revenue:** \$18,633,364.30
  - Sum of Revenue by Region:** SHOWING TOP 4 IN REGION (with a bar chart titled "Profit per Region" showing values for South, West, East, and North).
- Actions:** Includes Insights, Parameters, Themes, and Settings.





QuickSight | Patient-Info analysis

File Edit Data Insert Sheets Objects + ADD ▾

Dataset SPICE Patient-Info 100%

Visualize

Filter

Insights

Parameters

Actions

Themes

Settings

18°C Ensoleillé

Search

Autosave on DOWNLOAD

Computation ⓘ

Select a computation that you can use in your insight text

Computation type

Bottom ranked

Example output from this type of computation:

Bottom 3 States by sales are:

- North Dakota with \$919
- West Virginia with \$1,209
- Maine with \$1,270

Select

Your PDF is ready.

The screenshot shows the QuickSight analysis interface for a "Patient-Info analysis". The dashboard includes:

- Field wells:** Time (Admit Date), Values (Hospital (Count)), Categories (Category).
- Sheet 1:** A card titled "Top ranked" listing the top 3 categories for total count of Hospital: Surgical (2,411), Medical (2,141), and Critical Care (1,279). It also displays "Sum of Cost" (\$107,961.01) and "Sum of Revenue".
- Visual types:** A bar chart titled "% Discount By Cost" showing 0.38%.
- Profit per Region:** A bar chart showing profit by region: South (~\$100,000), West (~\$80,000), and East (~\$60,000).

The sidebar on the left lists fields like Admit Date, Category, Cost, and Discharge Date. The bottom status bar shows 18°C Ensoleillé, a search bar, and system icons.

The screenshot shows the QuickSight analysis interface with a computation dialog box open:

**Computation ⓘ**

Select a computation that you can use in your insight text

**Computation type:** Period over period

Example output from this type of computation:

Total sales for Nov 2014 increased by 44.39% (\$34,532) from \$77,793 to \$112,326.

**Select** **Customize insight**

The sidebar on the left lists fields like Admit Date, Category, Cost, and Discharge Date. The bottom status bar shows 18°C Ensoleillé, a search bar, and system icons.

File Edit Data Insert Sheets Objects AUTOSAVE ON

+ ADD ▾

**Dataset**: SPICE Patient-Info

**Fields list**: Profit, Discharge Date, Profit (Sum), Categories

**Visual types**: Bar chart, Line chart, Map, etc.

**Actions**: Insights, Filter, Parameters, Themes, Settings

**Visual wells**: Time (Discharge Date), Values (Profit (Sum)), Categories (Add dimensions here)

**Sheet 1**

**Top ranked**: Top 3 Category for total count of Hospital are:  

- Surgical with 2,411
- Medical with 2,141
- Critical Care with 1,279

**Insight**: Total Profit for Dec 31, 2018 increased by 10.92% (\$543.29) from 4,976.08 to 5,519.37.

**Sum of Cost**: \$107,961.01    **% Discount By Cost**: 0.38%

**Sum of Revenue**: \$18,633,364.30    **Profit per Region**

18°C Ensoleillé

file:///C:/Users/aliet/Downloads/Sheet\_1\_2023-07-21T08\_33\_00.pdf

Getting Started Amazon Booking.com

1 of 1 Automatic Zoom

**Top ranked**: Top 3 Category for total count of Hospital are:  

- Surgical with 2,411
- Medical with 2,141
- Critical Care with 1,279

**Insight**: Total Profit for Dec 31, 2018 increased by 10.92% (\$543.29) from 4,976.08 to 5,519.37.

**Sum of Cost**: \$107,961.01    **% Discount By Cost**: 0.38%

**Sum of Revenue**: \$18,633,364.30

**Sum of Revenue by Region**: SHOWING TOP 4 IN REGION

18°C Ensoleillé

10:33 21/07/2023