



Hands-on Lab: Analyzing DB2 Data With Cognos Analytics

Objective for Exercise:

- To create a dashboard with Billing data on DB2 using Cognos Analytics and analyze the regionwise spend.

Prerequisites

Prior to starting this lab please ensure you have completed the previous labs to:

- [Create an IBM Cloud Account](#)
- [Provision an instance of DB2 on Cloud](#)
- [Provision an instance of Cognos Analytics](#)

Task 1- Load the data in DB2

If you have service credentails created, skip steps 1 and 2.

1. Click on **Service Credentials** and create new credentials.

A screenshot of the IBM Cloud Service Credentials page. At the top, it shows the resource list, the name "Db2-4y", its status as "Active", and options to "Add tags" and "Actions...". Below this, there are several tabs: "Manage", "Getting started", "Service credentials" (which is highlighted with a blue border), and "Connections". On the right, there's a section titled "Service credentials" with a description: "You can generate a new set of credentials for cases where you want to manually connect an app or external consumer to an IBM Cloud service." It includes a "Learn more" link and a search bar at the bottom labeled "Search credentials...". A blue button at the bottom right says "New credential".

Resource list /

Db2-4y Active Add tags

Details Actions...

Manage

Getting started

Service credentials

Connections

You can generate a new set of credentials for cases where you want to manually connect an app or external consumer to an IBM Cloud service.

[Learn more](#)

Search credentials... New credential

2. Give the credential a name and **Manager** privilege and add it.

Create credential

Name:

Role:

[Advanced options](#)

3. Click on the down arrow next to the credential. You will see the credential details. Make a note of the username, password and jdbc connection url. These will be used in later part of the lab to connect from Cognos.

Service credentials

You can generate a new set of credentials for cases where you want to manually connect an app or external consumer to an IBM Cloud service. [Learn more](#)

<input type="text"/> Search credentials...	<input type="button"/> New credential
<input type="checkbox"/> Key name	Date created
<input checked="" type="checkbox"/> Service credentials-1	2021-09-20 12:30 PM

```

"db2": {
  "authentication": {
    "method": "direct",
    "password": "REDACTED",
    "username": "REDACTED"
  },
  "certificate": {
    "certificate_base64": "LS0tLS1CRUdJTibDRVJUSUZJQ0FURS0tLS0tck1JSURFakNDQWZxZ0F3SUJBZ01KQVA1S0R3ZTNCTkxiTUEwR0NTcUdTSWiZRFFFQkN3VUFN0jR4SFRBYUJnT1YK0kFNTUIjhENIUU0JFYkc5MVnD0kV7WFJnWW1Ge1pYTXdTaGN0TWhBd01aSTVNRF5TVRBeVdoY05NekF3TWhJMgpnNRFF5TVRBeVda0WVNIInd3R2dZRZRUUREQk5KUWswZ1EyeHzkV1FnUkdGMF1XSmhjM1Z6TU1JQk1qQU5CZ2txCmhraUc5dzBCQVFRRkFBTONBUTHBTU1JQkNnS0NBUVBdXUvbitpWW9xdkdGNU8xSGpEalpsK25iYjE4UkR4ZGwKTzRUL3FoUGMxMTREY1FUK0p1RXdhdG13aG1jTGxaQnF2QWFMb1hrbmhqsSVFOMG01L0x5YzdBY291VNmSGR0QwpDVGcrSuxbjBrdDMrTHM3d1dTakxqVE96N3M3M1ZUSU5yYmx3cnRIRU1vM1JWTKV6SkNHYW5LSXdZMWZVSUtrClndNM1R0SD15cnFsSGN0Z2pIu1FmRkVTRml1YaHJiODhS0md0anIva0xtVGpCaTFBeEVadWNobWZ2QVRmNEN0Y3EKY21QchNqdDBPTn10YnhJMVRyUwxEemNiN1hMSFBrWW91SuPrdnVzMUzvaTEySmRNM1MrK3labFZPMUZmZkU3bwpKMjhUdGJoZ3JG0Gt1U0NMSkJvTTFSZ3FPZG90Vm5Q0C9E0WZhamNNN01Wd2V4a01sOTNKR1FJREFRQUJvMU13C1VUQWRCZ05WSFE0RUZnUVV1Q3JZanFJQzc1VUpxVmZEMDh1ZWdqedZ1UmN3ShdZRFZSMGpCQmd3Rm9BVWVDb1kKanFJQzc1VUpxVmZEMDh1ZWdqedZ1UmN3RhZRFZSMFRBUUgvQkFvd0F3RU1vekFOQmdrcWhraUc5dzBCQVFzRgpBQU9DQVFFQukyRTBU0t3M1N3RjJ2MXBqaHV4M01kWWV2SGFVsKrMboPd0hSrnf0HgxZ2dRcGVFcFnMk5SCkx3R08yeK85SWZUMmhLaWd1d2oWnJ5SGxxchlxQ0pL0HJEU28xZUVPeK1yWmE2S1YrQTvscEttMwdjV3VHYzMKK1UzVTFzTDd1Ujd3ZFFUvJU0TVU4aErVNi9sVHRMRVB2Mnc3V1NPS1FDK013ejgczTFJMdjVHSW5BN1OySWNhKwozM0wxNnB4ZEttd1pLYThWcnBnMXJ3QzRnY3d1YUhYMUNEWE42K0J1bzhvWG5YWh6UG91c1dYS1BoaGdXZ2J5CkNDcUdIK0NWNnQ1eFg3b05NS3VNSUNqRVZndnNLWnRqeTQ5VW5iNVZZbHQ0b1J3dTf1bGdzRDNjeKitbj1LREQKNHB1REFvYTzyMktZZE4xVkxuN3F3VG1TbD1TU05RPT0KLS0tLS1FTkQgQ0VSVE1GSUNBVEutLS0tLQo=",
    "name": "1cbbb1b6-3a1a-4d49-9262-3102a8f7a7c8"
  },
  "composed": [
    "db2://lfn96733:d10xxWy1FwKzIe0Y@fb88901-ebdb-4a4f-a32e-9822b9fb237b.c1ogj3sd0tgtu0lqde00.databases.appdomain.cloud:32731/bludb?authSource=admin&replicaSet=replset"
  ],
  "database": "bludb",
  "host_ress": [
    "fb88901-ebdb-4a4f-a32e-9822b9fb237b.c1ogj3sd0tgtu0lqde00.databases.appdomain.cloud:32670"
  ],
  "hosts": [
    {
      "hostname": "fb88901-ebdb-4a4f-a32e-9822b9fb237b.c1ogj3sd0tgtu0lqde00.databases.appdomain.cloud",
      "port": 32731
    }
  ],
  "jdbc_url": [
    "jdbc:db2://fb88901-ebdb-4a4f-a32e-9822b9fb237b.c1ogj3sd0tgtu0lqde00.databases.appdomain.cloud:32731/bludb:user=<userid>;password=<your_password>;sslConnection=true;"
  ]
}

```

*Note: You have to replace the placeholder for username and password in the jdbc url string with actual username and password.
Remove the angle brackets.

4. Go to the [data link](#). Right-click and choose **Save AS....** Save the file in your local system as *cloud-billing-dataset.csv*.

5. Once the instance is created from the db2 instance page, choose **Manage** from the left menu and click on **Go to UI**.

Resource list / **Db2-4y** Active Add tags [Edit](#) Details Actions...

Manage

- Getting started
- Service credentials
- Connections

Getting started

Where can I find my credentials?
Get your username and password by clicking the "Service Credentials" link to the left and selecting "New Credentials".

[Go to UI](#) [Getting started docs](#)

6. Click on the **Data** icon on the left menu, choose **Load Data** and browse and select the file, **cloud-billing-dataset.csv** which you saved in your local system.

Load Data Load History Tables Views Indexes Aliases MQTs Sequences

Source Target Define Finalize

You are loading the file

My Computer
A single delimited text file (CSV) without header row.

S3 Amazon S3

Cloud Object Storage

File selection

Drag a file here or [browse files](#)

Next

7. Choose the **Schema**, click on **New Table +** and create a new table with the name **BillingData** and click on Create.

Source Target Define FinalizeYou are loading the file **cloud-billing-dataset.csv**

Select a load target

[Refresh](#)

Schema

 Find schemas

XQR63068

Table

[New table +](#) Find tables in XQR63068

No entries found.

Create a new table

BillingData

[Create](#)[Back](#)[Next](#)8. You will see the table is added to the schema. Click on **Next** to load the data from the file. Source Target Define FinalizeYou are loading the file **cloud-billing-dataset.csv** into **XQR63068.BILLINGDATA**

Select a load target

[Refresh](#)

Schema

 Find schemas

XQR63068

Table

[New table +](#) Find tables in XQR63068

BILLINGDATA

[Back](#)[Next](#)9. The table is loaded. You will see that each column has data type and column width auto generated based on the content. Edit column attributes by clicking on the pencil icon next to the respective attributes to change the width of **country** column to varchar of 30 and **month** column to varchar of 7.

Source Target Define Finalize

You are loading the file **cloud-billing-dataset.csv** into **XQR63068.BILLINGDATA**

Code page (character encoding): 1208 (UTF-8) Separator: , Header in first row: Time & date format:

	CUSTOMERID SMALLINT	CATEGORY VARCHAR(10)	COUNTRY VARCHAR(22)	INDUSTRY VARCHAR(24)	MONTH VARCHAR(6)	BILLEDAMOUNT SMALLINT
1	1	Individual	Indonesia	Engineering	2009-1	5060
2	614	Individual	United States	Product Management	2009-1	9638
3	615	Individual	China	Services	2009-1	11573
4	616	Individual	Russia	Accounting	2009-1	18697
5	617	Individual	Chile	Business Development	2009-1	944
6	618	Individual	Nicaragua	Human Resources	2009-1	3539
7	41	Company	Brazil	Marketing	2009-1	6591
8	619	Individual	Russia	Business Development	2009-1	16061
9	620	Individual	China	Business Development	2009-1	1250
10	956	Individual	Peru	Research and Development	2009-1	15105

[Back](#) [Next](#)

X

month	Edit column data type
VARCHAR(6)	Data type
2009-1	VARCHAR
2009-1	Maximum number of characters (1 - 32592)
2009-1	7
2009-1	
2009-1	

[Close](#) [OK](#)

country
VARCHAR(22)

Indonesia

United States

China

Russia

Chile

Edit column data type

Data type

VARCHAR

Maximum number of characters
(1 - 32592)

30

Close

OK

10. Once the column attributes are changed, check to see if it reflects and then click on **Next**

Source Target Define Finalize

You are loading the file **cloud-billing-dataset.csv** into **XQR63068.BILLING DATA**

	CUSTOMERID	CATEGORY	COUNTRY	INDUSTRY	MONTH	BILLEDAMOUNT
	SMALLINT	VARCHAR(10)	VARCHAR(30)	VARCHAR(24)	VARCHAR(7)	SMALLINT
1	1	Individual	Indonesia	Engineering	2009-1	5060
2	614	Individual	United States	Product Management	2009-1	9638
3	615	Individual	China	Services	2009-1	11573
4	616	Individual	Russia	Accounting	2009-1	18697
5	617	Individual	Chile	Business Development	2009-1	944
6	618	Individual	Nicaragua	Human Resources	2009-1	3539
7	41	Company	Brazil	Marketing	2009-1	6591
8	619	Individual	Russia	Business Development	2009-1	16061
9	620	Individual	China	Business Development	2009-1	1250
10	956	Individual	Peru	Research and Development	2009-1	15105

Back Next

11. Review the settings and click on **Begin Load** to load the data.

Source Target Define Finalize

You are loading the file **cloud-billing-dataset.csv** into **XQR63068.BILLINGDATA**

Review settings

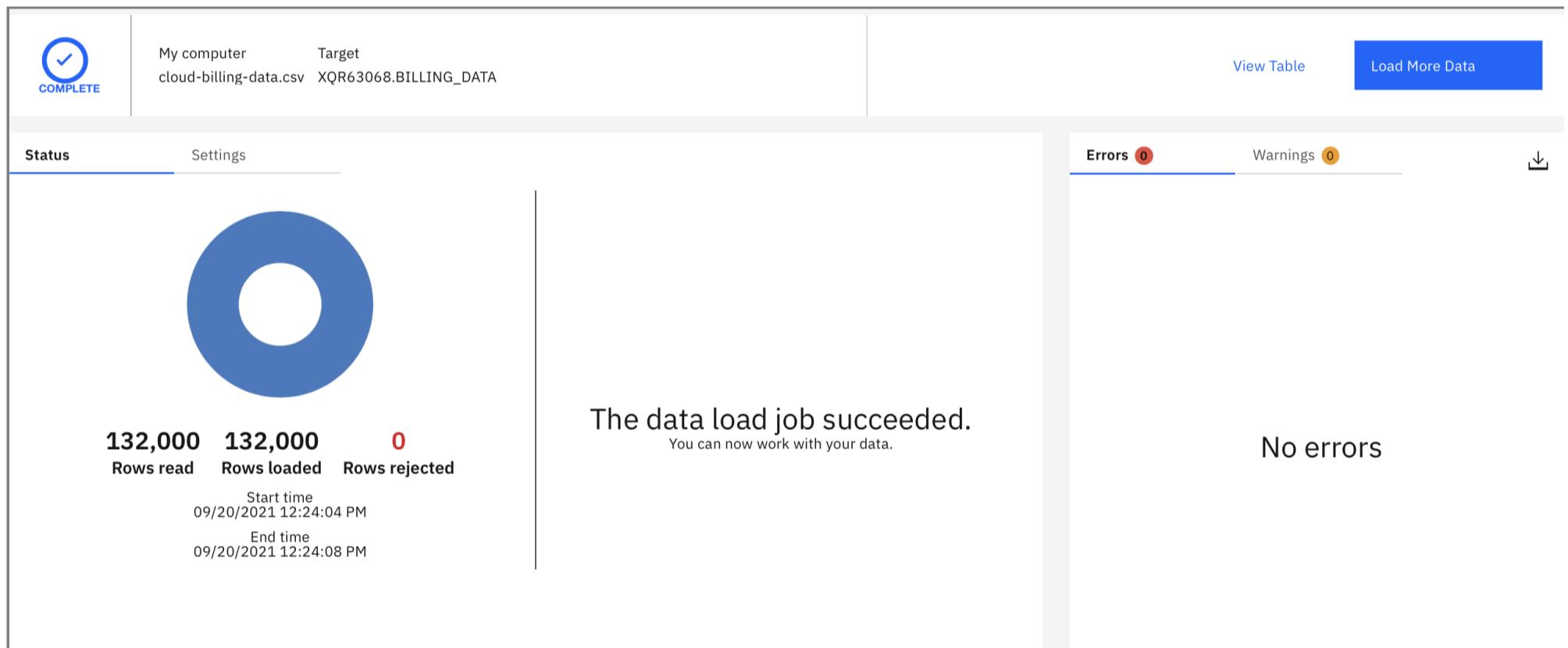
Summary

Code page:	1208 (Default)
Separator:	,
Time format:	HH:MM:SS (Default)
Date format:	YYYY-MM-DD (Default)
Timestamp format:	YYYY-MM-DD HH:MM:SS (Default)
String delimiter:	(Default)

Option
Maximum number of warnings

[Back](#) Begin Load

12. If the data is successfully loaded, you get a message on the screen indicating the number of rows that have been loaded.



Task 2 - Connect Cognos to DB2

1. Go to myibm.ibm.com, login with your IBM Cloud credentials and launch Cognos Analytics.

The screenshot shows the 'Trials' section of the IBM Cloud interface. It lists two offerings: 'IBM Cloud' (Active) and 'IBM Cognos Analytics on Cloud - Trial' (Active, expires on 16 Oct 2021). Each offering has a 'Launch' and a 'Manage' button.

2. Choose the hamburger menu on the upper left and select **Manage**.

The screenshot shows the 'Home' screen of the IBM Cognos Analytics interface. It includes sections for '+ New', 'Upload files', 'Content', 'Recent', and a prominent 'Manage' button highlighted with a red border.

3. Choose the **Data Server Connection**.

IBM Cognos Analytics

- People**
Create and manage accounts and contacts
- Data server connections**
Create and manage connections
- Customization**
Manage themes and extensions
- Collaboration**
Manage collaboration settings
- Secure Gateways**
Create and manage Secure Gateways

4. Click on + to add a data server and choose IBM DB2 from the list shown.

Data server connections

Name	Modified
Weather Company	25/05/2021 8:57 PM

Select a type

- Amazon Athena
- Amazon Redshift
- Cloudera Impala
- Hive
- IBM Big SQL
- IBM Db2**
- IBM Db2 for i
- IBM Db2 Warehouse
- IBM Informix Dynamic Server
- IBM Netezza
- IBM Planning Analytics

5. Choose to **Connect Anonymously** and enter the jdbc url with your db2 user name and password that you copied earlier in Task 1. Click on **Test** to test the connection.

The screenshot shows the 'New data server connection' screen for IBM Db2. On the left, under 'Connection details', there is an 'Authentication method' section with four options: 'Connect anonymously' (selected), 'Prompt for the user ID and password', 'Use an external namespace', and 'Use the following signon:'. Below this is a 'Test' button, which is highlighted with a red box. To the right, the 'Edit IBM Db2 connection' panel shows the JDBC URL: `jdbc:db2://fb88901-ebdb-4a4f-a32e-9822b9fb237b.c1ogj3sd0tgtu0lqde00.databases.appdomain.cloud:32731/bludb:user=lfn96733;password=`. The 'Driver class name:' field contains `com.ibm.db2.jcc.DB2Driver`. There are also sections for 'Example URL', 'Connection properties:', and buttons for 'Save' and 'Close'.

6. If the test succeeded and Cognos managed to connect to the Db2 instance, you will see **Success** with a green tick next to it. Click on the pencil icon, give the connection a name, **MyDB2**, and save it.

The screenshot shows the 'MyDB2' connection settings page. The 'Edit' button is highlighted with a red box. The 'Test' button has a red box around it and shows a green checkmark with the word 'Success'. The 'Save' button is also highlighted with a red box. The right side of the screen shows the 'Edit IBM Db2 connection' panel with the same JDBC URL and driver configuration as the previous screenshot.

7. Go to the **Schema** and click on the '...' next to the schema name. Choose **Load Metadata** from the menu that appears.

MyDB2

Owner: Sriram ... 39657 | Created: 16/09/2021 3:20 AM
Modified: 16/09/2021 7:48 AM | Type: Connection

General Settings Schemas **Schemas** Permissions

Status	Schema name	Tables loaded
<input type="radio"/>	AUDIT	
<input type="radio"/>	DB2INST1	
<input type="radio"/>	ERRORSCHEMA	
<input type="radio"/>	LFN96733	

Load metadata

Load options

8. Once the metadata is loaded you will see a green check mark next to the schema name and it will also indicate how many tables are available in the schema for analysis.

MyDB2

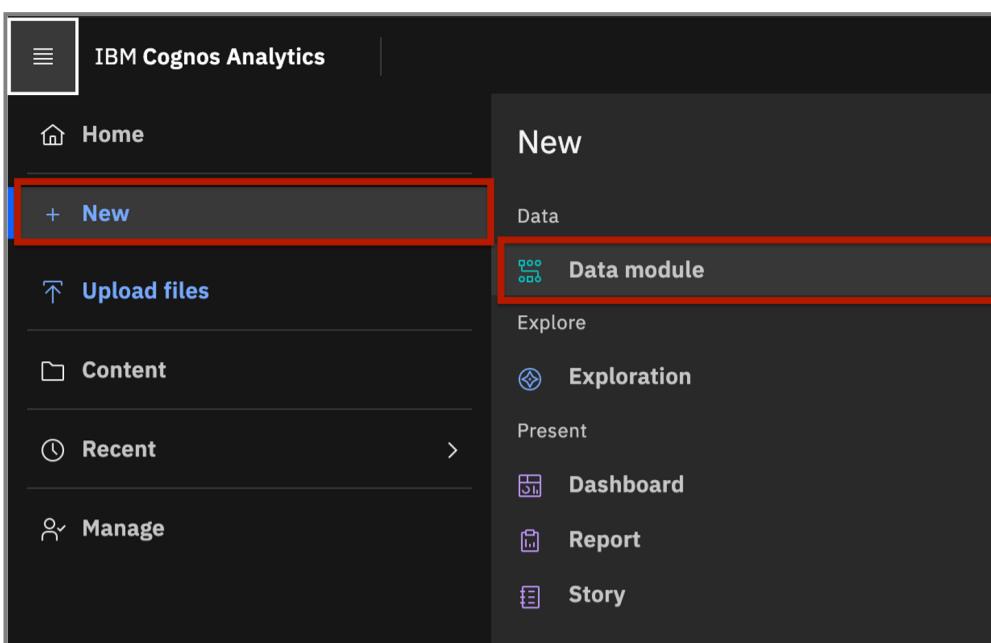
Owner: Sriram ... 39657 | Created: 16/09/2021 3:20 AM
Modified: 16/09/2021 7:48 AM | Type: Connection

General Settings Schemas **Schemas** Permissions

Status	Schema name	Tables loaded
<input type="radio"/>	AUDIT	
<input type="radio"/>	DB2INST1	
<input type="radio"/>	ERRORSCHEMA	
<input checked="" type="radio"/>	LFN96733	2 / 2

Task 3 - Create Data Module in Cognos

1. From the menu, choose **New** and then from the submenu choose **Data Module**.



2. Click the **Data servers** icon and choose the **MyDB2** connection that we created in the previous task.

A screenshot of the 'Select sources' screen. On the left is a vertical toolbar with icons for search, folder, user, clock, and database. The database icon is highlighted with a blue bar. To its right is a section titled 'Data servers' with a search bar that says 'Type any text to filter items in this folder'. Below the search bar is a list of two items: 'MyDB2' (last modified 9/16/2021 3:20 AM) and 'Weather Company' (last modified 5/25/2021 8:57 PM).

Select sources

Data servers

Type any text to filter items in this folder

MyDB2
9/16/2021 3:20 AM

Weather Company
5/25/2021 8:57 PM

3. Choose the schema from where you want to load data.

Select sources

← Data servers / MyDB2

Type any text to filter items in this folder

LFN96733
9/16/2021 3:52 AM

Cancel OK

4. Choose the **Select Tables** option and click **OK**.

Add tables

Specify how to add tables to your data module.

Select tables

Select the tables that you want to include in your data module, and create the data module manually.

Discover related tables

Engage the system to recommend related tables for your data module and create the data module for you.

Cancel Next

5. It will list the tables available in the schema. For this lab, we will use the **Billing data** table. Choose the table and click on **OK**. If you want to view the data you may click on **Refresh**.

Select tables

Available sources	Customerid	Category	Country	Industry	Month	Billedamount
LFN96733						
Billing Data						
Customer Loyalty						

Data will appear here

Refresh

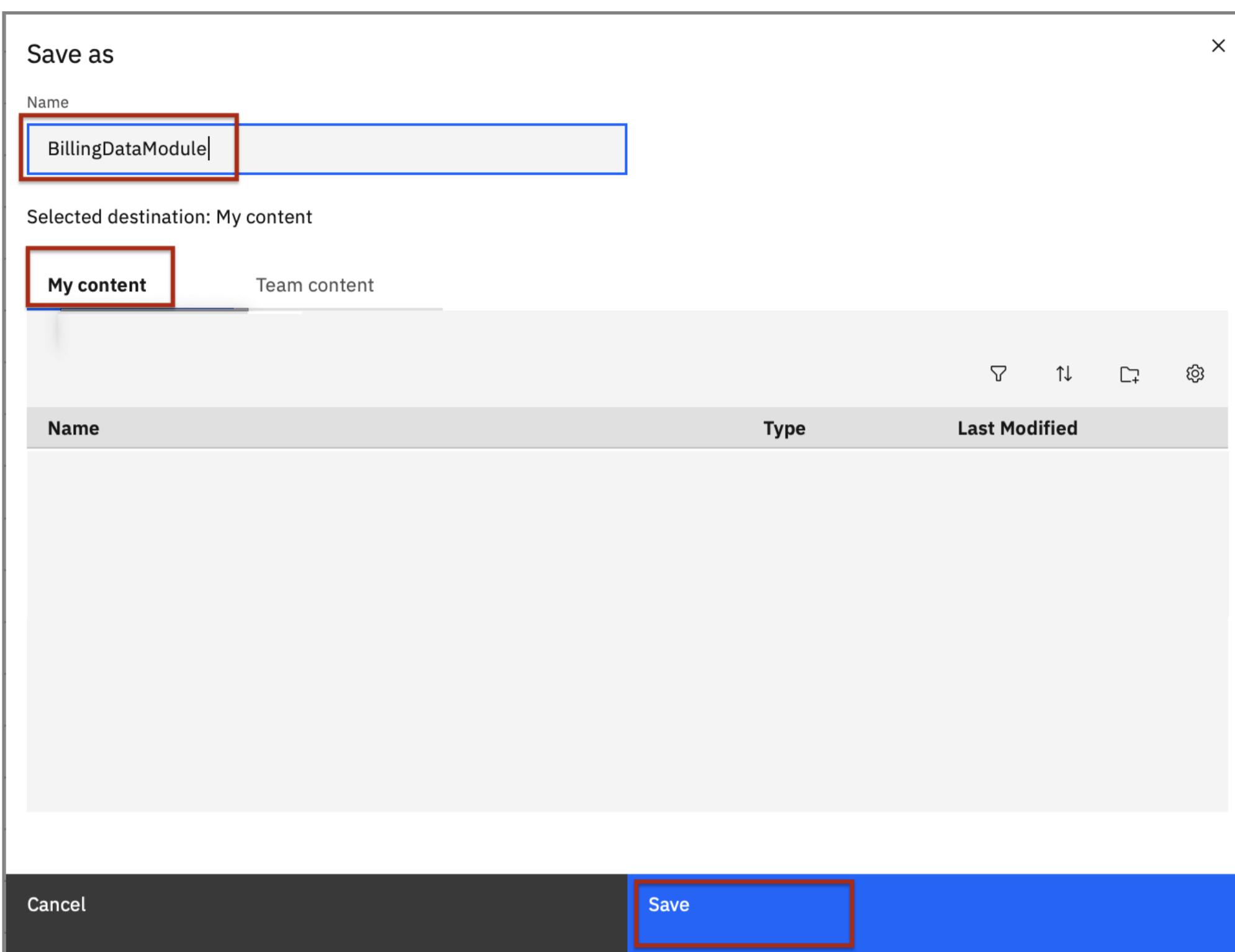
Previous Cancel OK

6. The **Data module** loaded with the data appears. Click on **Save**, once you see that the data is correctly loaded.

The screenshot shows the Cognos Data module interface. On the left, there's a sidebar with a tree view of data sources. A red box highlights the 'Data module' button at the top of this sidebar. Below it, under 'Navigation paths', 'Billing Data' is selected, indicated by a blue highlight. The main area is a grid displaying data from the 'Billing Data' source. The columns are Customerid, Category, Country, Industry, Month, and Billedamount. The data consists of 12 rows with various values for each column.

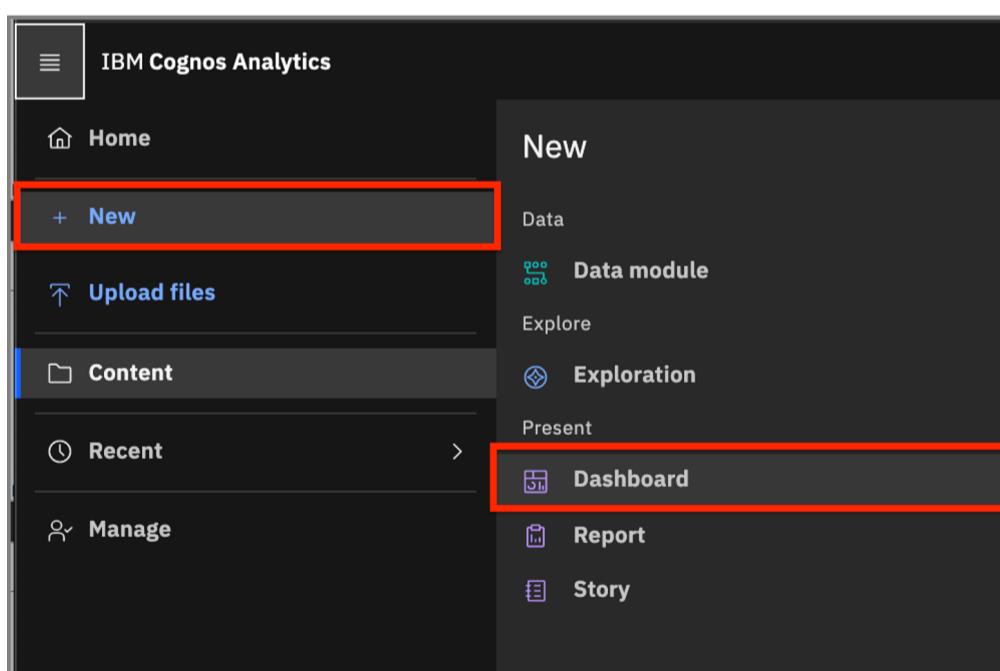
Customerid	Category	Country	Industry	Month	Billedamount
1	Individual	Indonesia	Engineering	2009-1	5060
614	Individual	United States	Product Management	2009-1	9638
615	Individual	China	Services	2009-1	11573
616	Individual	Russia	Accounting	2009-1	18697
617	Individual	Chile	Business Development	2009-1	944
618	Individual	Nicaragua	Human Resources	2009-1	3539
41	Company	Brazil	Marketing	2009-1	6591
619	Individual	Russia	Business Development	2009-1	16061
620	Individual	China	Business Development	2009-1	1250
956	Individual	Peru	Research and Development	2009-1	15105
621	Individual	Angola	Services	2009-1	6644

7. You can now save it with an appropriate name under **My Content**.

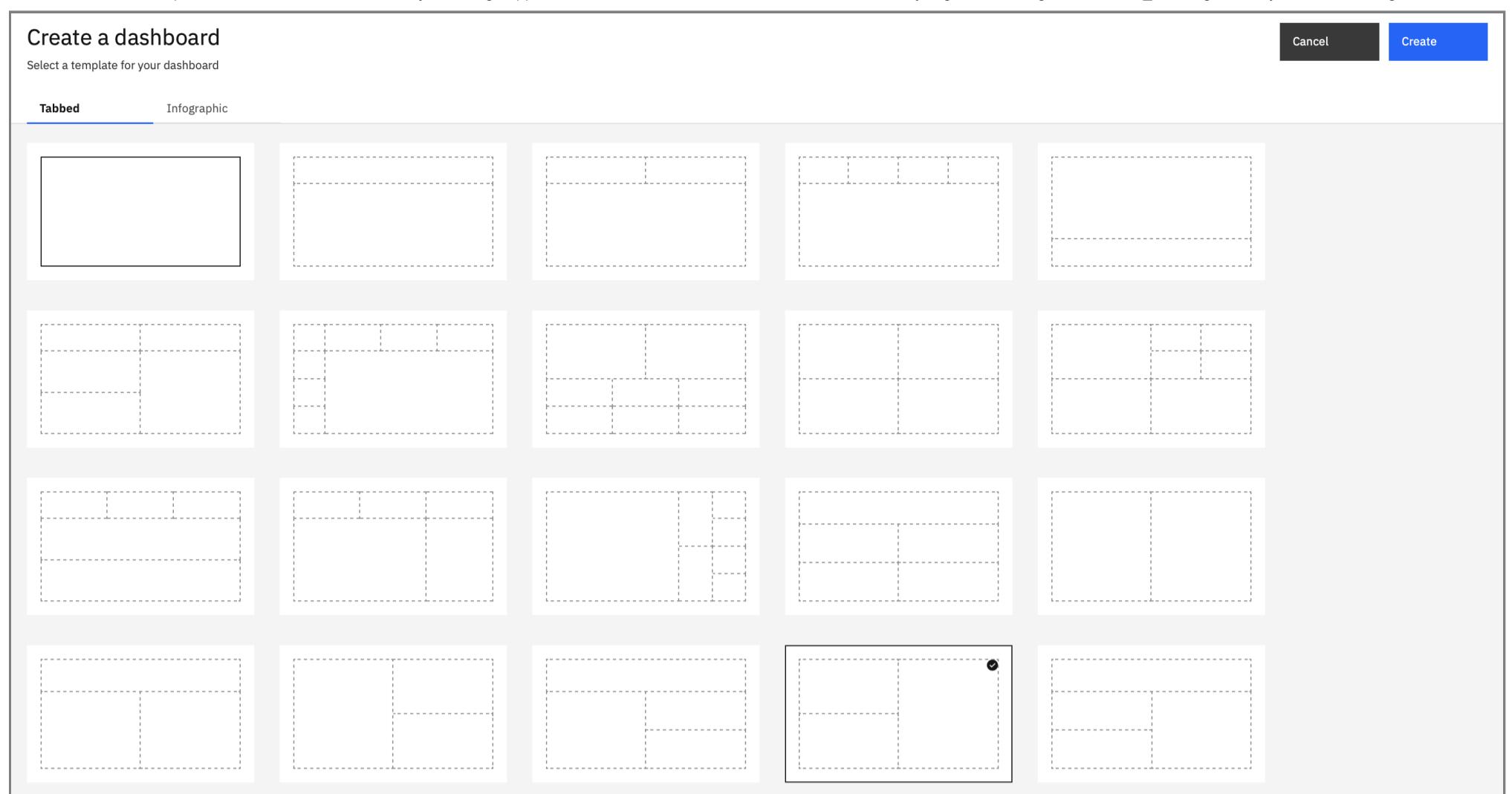


Task 4 - Create Dashboard

1. From the IBM Cognos menu, choose, **New** and click on **Dashboard**.



2. Choose the **Tabbed** as shown in the following image.



3. Click on **Select Source** to choose the source for the template.

The screenshot shows the 'New dashboard *' screen in IBM Cognos Analytics. The left sidebar has icons for Data, Report, Scorecard, and Model. The main area has tabs for 'Data' (selected), 'All tabs', and 'Tab 1'. A large blue button at the bottom left says 'Select a source +'. The top navigation bar includes 'Edit', 'Share', and search functions.

4. From the list, choose the data module we just created and click on **Add**.

Select a source

My content Team content

Name	Type	Last Modified
BillingDataModule	Data module	20/09/2021 4:18 AM

Cancel Add

Task 5 - Visualization

You will now see the table listed on the left panel with all the attributes.

1. Drag and drop the **Billed Amount** on the template.

IBM Cognos Analytics | New dashboard * | 26 | Search Cognos Analytics | Filters | Fields | Properties

Selected sources /

BillingDataModule

Q Search

All tabs Drag and drop data here to filter all tabs.

This tab Drag and drop data here to filter this tab.

Tab 1 +

Billedamount

Drop here to maximize

2. The total billed amount will now appear on the Dashboard. The size and position can be adjusted as per requirement and the text display can be edited and formatted by double-clicking on it.

The screenshot shows the IBM Cognos Analytics interface. On the left, the 'Selected sources /' pane shows a 'BillingDataModule' with a tree view of data: Navigation paths, Billing Data (Customerid, Category, Country, Industry, Month), and Billedamount. A large text visualization '1.32B' is centered on the dashboard, with the text 'Billedamount' repeated below it. A red arrow points to the word 'Billedamount' in the text above the visualization, with the text 'Double click on this to edit or format the text' overlaid. The top navigation bar includes tabs for 'Summary', 'Fields', 'Properties', and other dashboard management options. A message at the bottom right states 'Data on this dashboard is provided by IBM Db2.'

3. Drag and drop **Billed Amount** and **Industry** onto the dashboard as shown in the following image. With this, we can visualize the build amount per industry.

This screenshot shows the same IBM Cognos Analytics interface as the previous one, but with a secondary visualization area below the main text. The 'Selected sources /' pane shows the 'BillingDataModule' with the 'Industry' node selected. A blue box highlights the 'Industry' node in the tree. Below the main text, there is a smaller visualization area containing a blue box with the text 'Billedamount' and 'Industry'. A cursor is hovering over a 'Drop here to maximize' button. The top navigation bar and the 'Data on this dashboard is provided by IBM Db2.' message are visible.

4. Drag and drop **Billed Amount**, **Country** and **Industry** onto the dashboard as shown in the following image. This will generate a heat map of spending by country and by industry.

The dashboard displays a summary of billed amounts across different industries. The main visualization is a bar chart titled 'Billedamount by Industry' showing the total amount for each industry. The industries listed on the x-axis are Accounting, Business Development, Human Resources, Legal, Marketing, Product Management, Research and Development, Sales, Services, Support, and Training. The y-axis represents the Billedamount (Sum) in millions, ranging from 0 to 120,000,000. The chart shows that the Engineering and Legal industries have the highest billed amounts, both reaching approximately 120 million.

5. The finished dashboard will appear as in the following image.

The finished dashboard provides a detailed breakdown of billed amounts. It includes a large title '1.32B' and a bar chart titled 'Billedamount by Industry' showing the total amount for each industry. The industries listed on the x-axis are Accounting, Business Development, Human Resources, Legal, Marketing, Product Management, Research and Development, Sales, Services, Support, and Training. The y-axis represents the Billedamount (Sum) in millions, ranging from 0 to 120,000,000. The chart shows that the Engineering and Legal industries have the highest billed amounts, both reaching approximately 120 million. To the right of the bar chart is a heatmap titled 'Billedamount by Country and Industry'. The x-axis represents the industries, and the y-axis represents the countries. The color intensity of the cells in the heatmap corresponds to the total billed amount for each country-industry combination, with darker colors indicating higher values. The heatmap shows that the highest revenue is concentrated in the United States, followed by other countries like Canada, Germany, and the United Kingdom.

6. Optionally, try to change the properties and settings to see how the dashboard changes. You can also observe the billed amount changing as you click on a region on the heat map or the bar graph.

Author(s)

[Lavanya T S](#)

Changelog

Date	Version	Changed by	Change Description
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Date	Version	Changed by	Change Description
2020-09-20	1.0	Lavanya	Created the lab
2021-10-7	1.1	Steve Hord	Copy Edit lab

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