

Build Machine Learning Automatically Models

with Auto AI

Required Service :

- Watson Machine Learning with (Auto AI)
- Watson Studio
- Cloud Object Storage

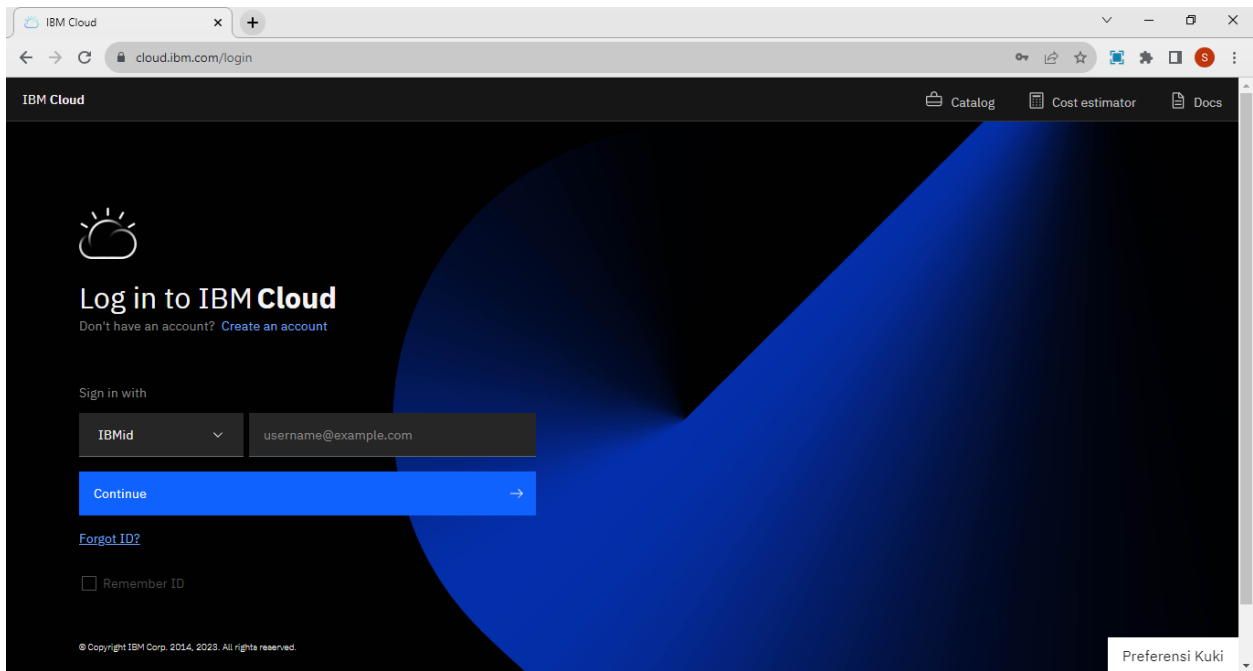
Data Format : File CSV, dengan pembatas koma (,) untuk semua jenis eksperimen AutoAI

Pada tutorial ini menggunakan data `german_credit_data_biased_training.csv` seperti pada gambar berikut.

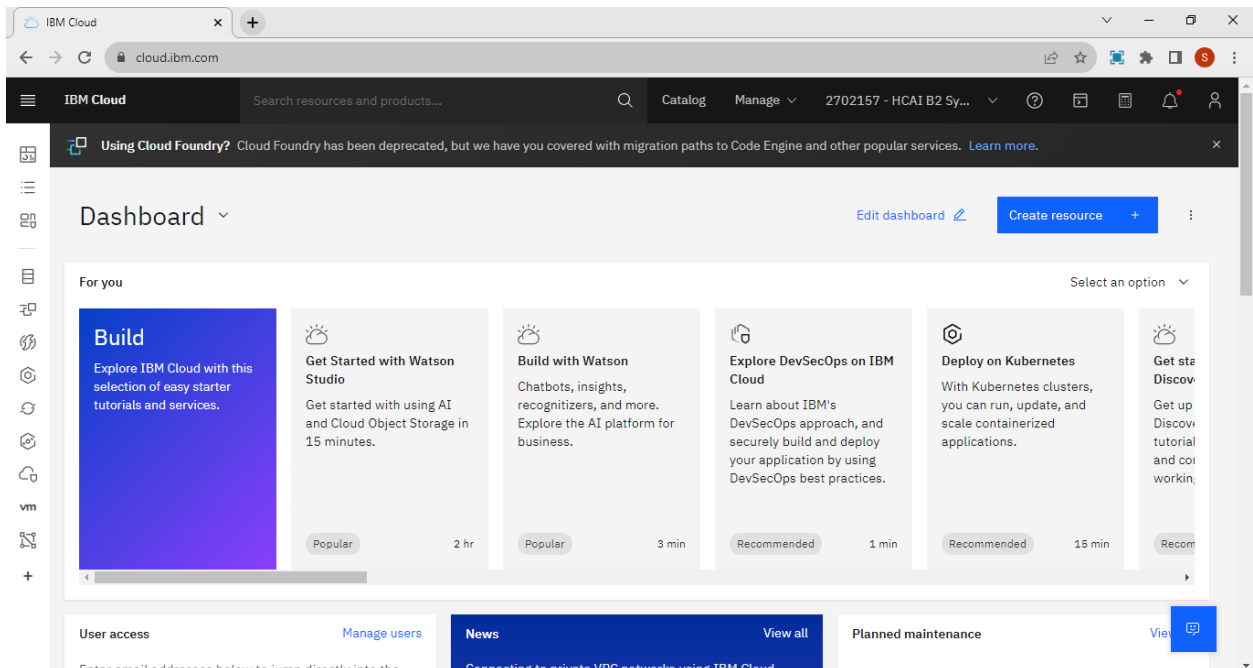
german_credit_data_biased_training.csv - Microsoft Excel (Product Activation Failed)																																																																	
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2	31	credits_pe	other	1889	100_to_50	less_1		3 female	none	3 savings_ir	32	none	own		1 skilled		1 none	yes	No Risk																																														
3	18	credits_pe	car_new	462	less_100	1_to_4		2 female	none	2 savings_ir	37	stores	own		2 skilled		1 none	yes	No Risk																																														
4	15	prior_payi	furniture	250	less_100	1_to_4		2 male	none	3 real_estat	28	none	own		2 skilled		1 yes	no	No Risk																																														
5	28	credits_pe	retraining	3693	less_100	greater_7		3 male	none	2 savings_ir	32	none	own		1 skilled		1 none	yes	No Risk																																														
6	28	prior_payi	education	6235	500_to_10	greater_7		3 male	none	3 unknown	57	none	own		2 skilled		1 none	yes	Risk																																														
7	32	outstandi	vacation	9604	500_to_10	greater_7		6 male	co-applca	5 unknown	57	none	free		2 skilled		2 yes	yes	Risk																																														
8	9	prior_payi	car_new	1032	100_to_50	4_to_7		3 male	none	4 savings_ir	41	none	own		1 managem		1 none	yes	No Risk																																														
9	16	credits_pe	vacation	3109	less_100	4_to_7		3 female	none	1 car_other	36	none	own		2 skilled		1 none	yes	No Risk																																														
10	11	credits_pe	car_new	4553	less_100	less_1		3 female	none	3 savings_ir	22	none	own		1 managem		1 none	yes	No Risk																																														
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12	5	all_credits	car_new	1523	less_100	unemploy		2 female	none	2 real_estat	19	none	rent		1 managem		1 none	yes	No Risk																																														
13	9	all_credits	car_used	4302	less_100	1_to_4		3 male	none	1 car_other	34	none	free		1 skilled		1 none	yes	No Risk																																														
14	27	outstandi	furniture	3310	500_to_10	greater_7		5 male	none	3 car_other	40	none	free		1 skilled		1 yes	yes	No Risk																																														
15	29	credits_pe	furniture	3705	less_100	less_1		3 female	co-applca	3 car_other	44	none	own		1 skilled		1 none	yes	No Risk																																														
16	4	all_credits	car_new	2407	less_100	1_to_4		3 female	none	2 car_other	52	none	own		1 skilled		2 yes	yes	No Risk																																														
17	33	all_credits	furniture	3810	100_to_50	less_1		2 female	co-applca	4 savings_ir	35	none	own		1 skilled		1 none	yes	Risk																																														
18	4	all_credits	car_new	250	less_100	1_to_4		2 female	none	1 real_estat	26	none	own		1 skilled		1 none	yes	No Risk																																														
19	39	prior_payi	repairs	7150	500_to_10	4_to_7		3 male	co-applca	4 unknown	52	none	own		2 skilled		1 yes	yes	Risk																																														
20	4	all_credits	car_new	250	less_100	1_to_4		2 female	none	2 real_estat	28	none	own		1 skilled		1 none	yes	No Risk																																														
21	13	all_credits	vacation	2317	less_100	less_1		2 female	none	2 savings_ir	27	stores	own		2 skilled		1 none	yes	No Risk																																														
22	15	prior_payi	furniture	250	500_to_10	4_to_7		3 male	none	2 savings_ir	24	none	own		2 skilled		2 yes	yes	No Risk																																														
23	16	prior_payi	car_new	5551	100_to_50	1_to_4		3 male	none	3 car_other	34	none	rent		2 managem		1 none	yes	No Risk																																														
24	34	prior_payi	furniture	6063	unknown	1_to_4		4 male	none	5 car_other	40	none	own		2 skilled		1 none	yes	No Risk																																														
25	13	all_credits	radio_tv	1045	100_to_50	less_1		2 female	none	1 real_estat	24	none	rent		1 skilled		1 none	yes	No Risk																																														

START IBM CLOUD

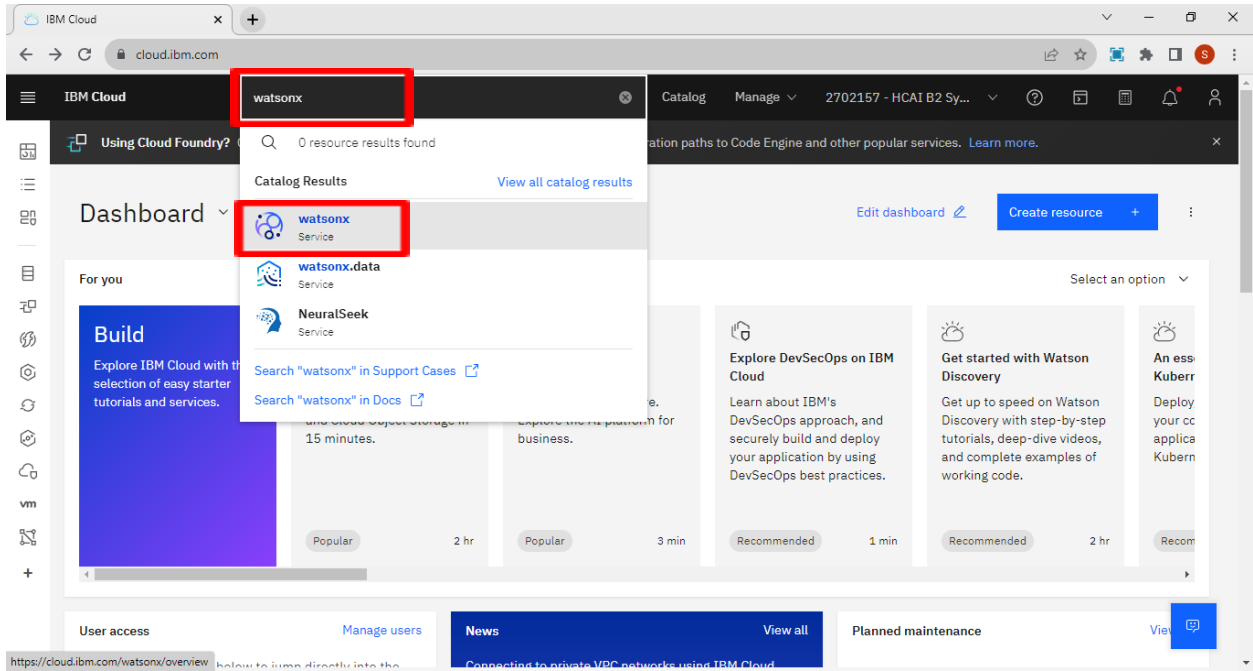
1. Login ke IBM Cloud dengan akun IBMid di link berikut : <https://cloud.ibm.com/login>



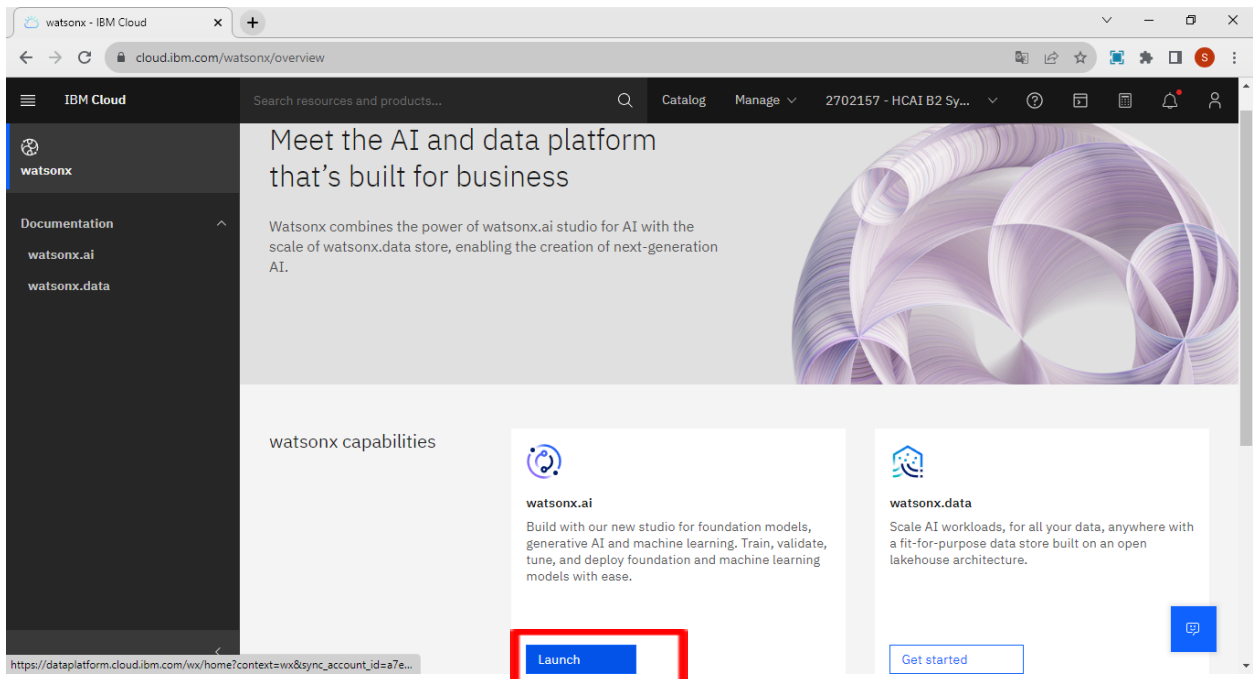
2. Anda akan diarahkan pada tampilan dashboard IBM Cloud



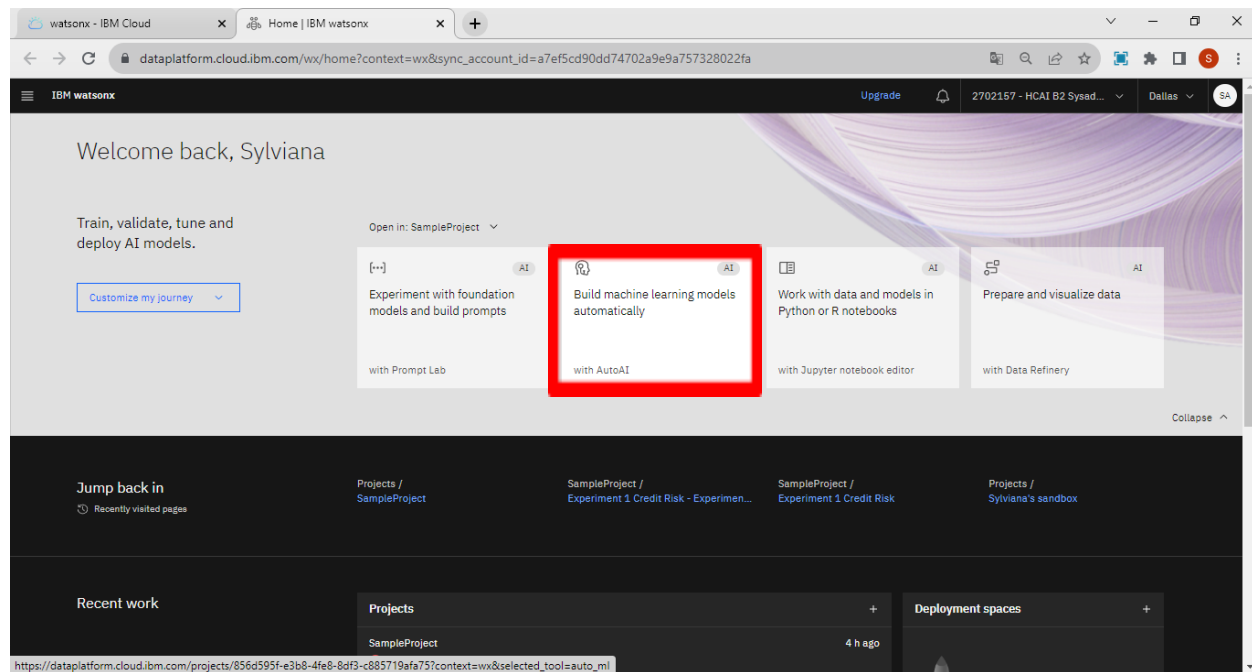
3. Selanjutnya, cari service **watsonx** pada menu pencarian



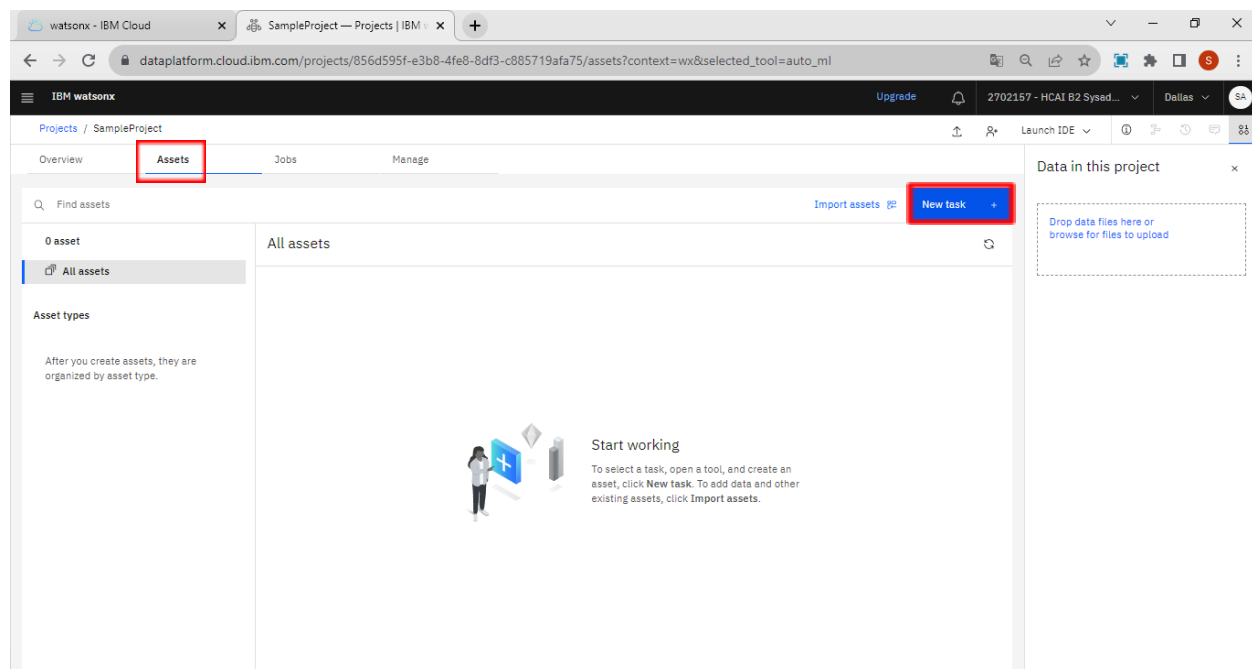
4. Selanjutnya pilih **watson.ai** dan klik **launch** untuk menjalankannya



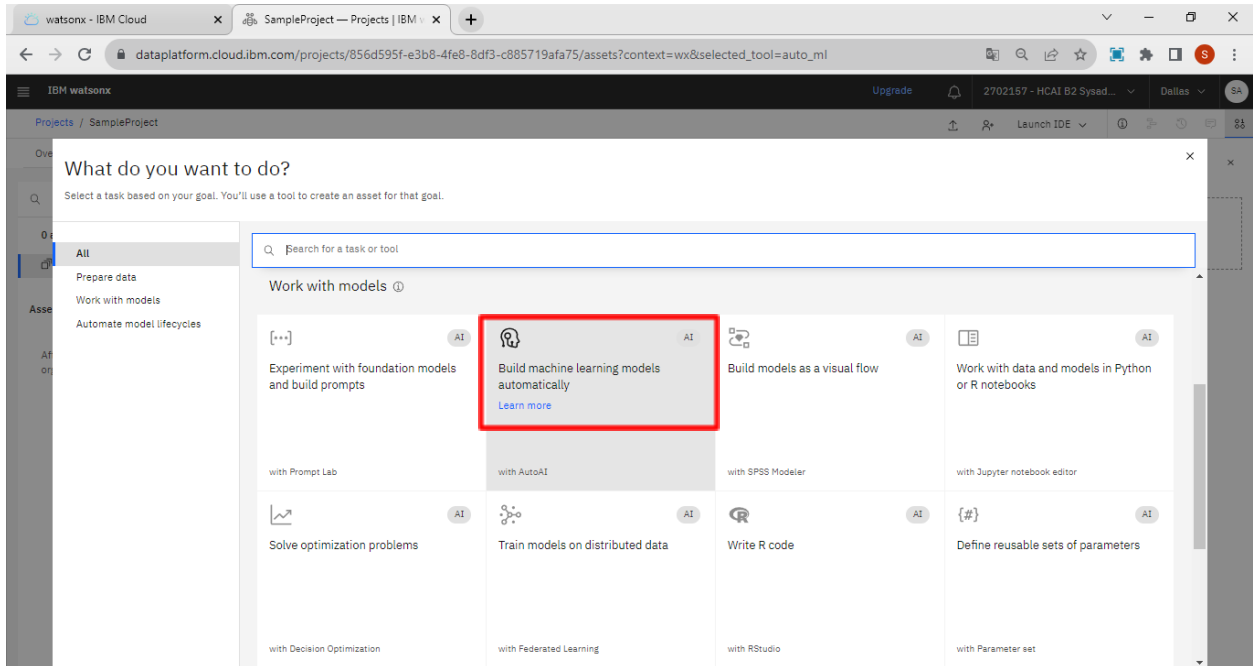
5. Pilih bagian **Build machine learning models automatically** with AutoAI



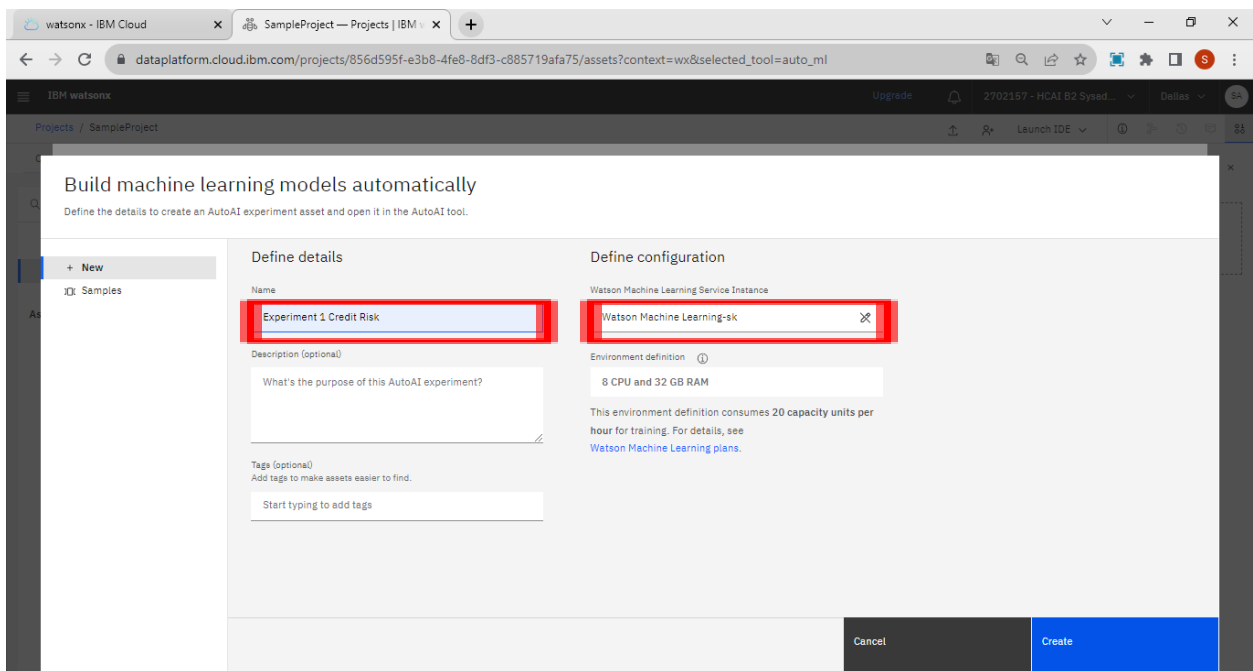
6. Selanjutnya anda akan diarahkan pada halaman project. Pilih **Assets > New Task**



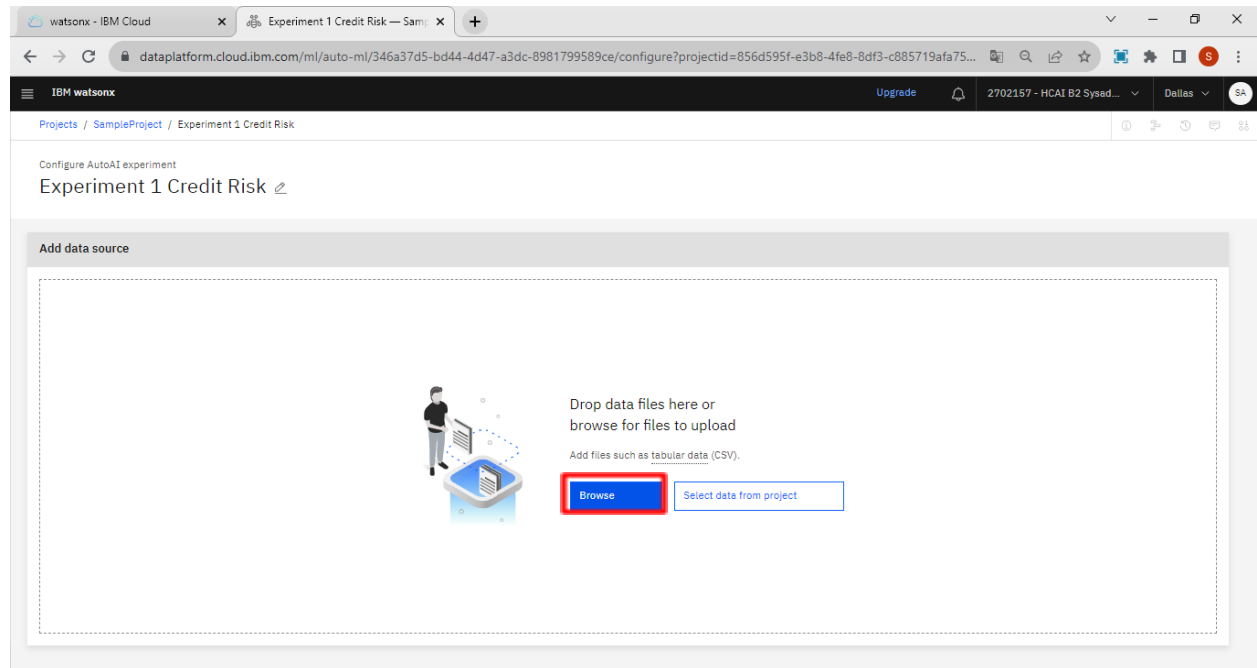
7. Pilih kembali bagian **Build machine learning models automatically** with AutoAI



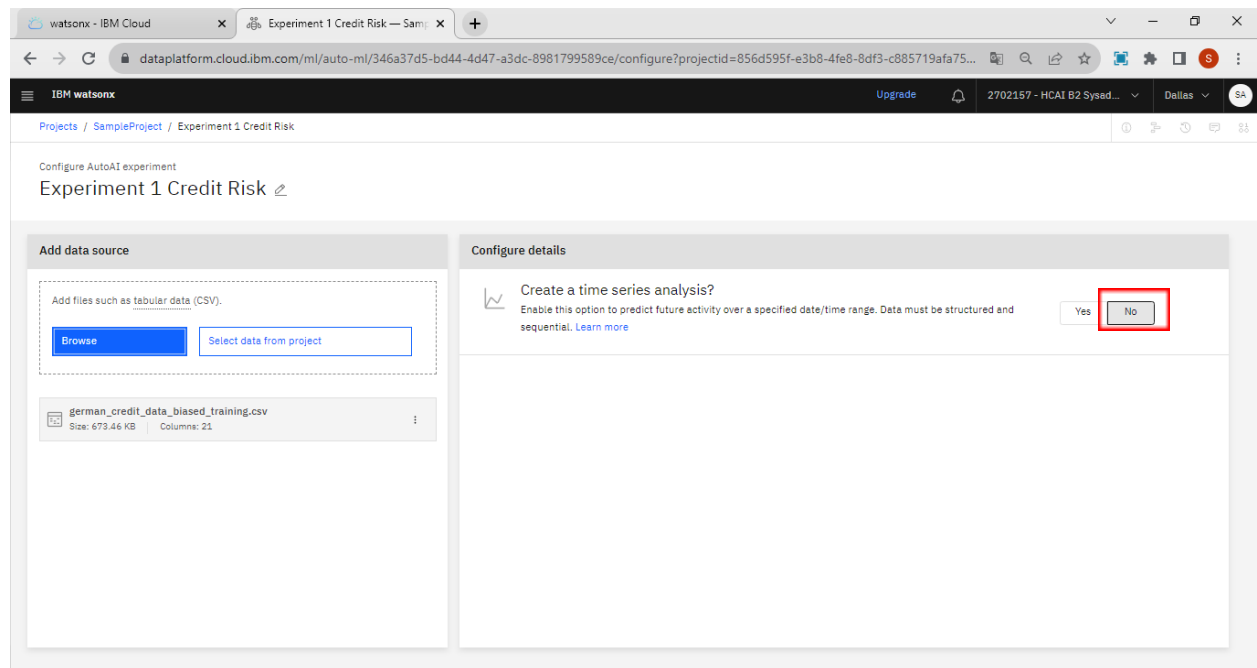
8. Tentukan nama dan deskripsi opsional untuk eksperimen yang dilakukan. Klik link **Associate a Machine Learning service instance** untuk mengaitkan Associate a Machine Learning service instance Server dengan proyek Anda. Klik **reload** untuk mengonfirmasi konfigurasi. Kemudian **Create**



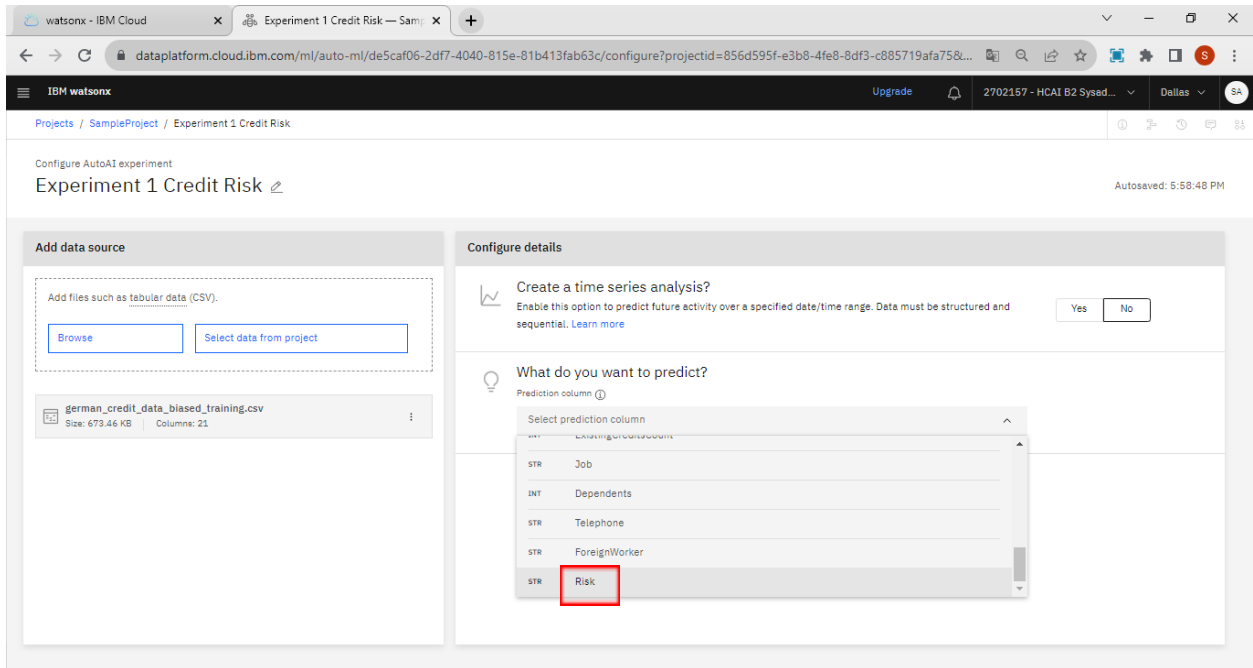
9. Selanjutnya, Anda akan diarahkan pada bagian input file. Pilih **Browse** dan masukkan Dataset dengan format file.CSV



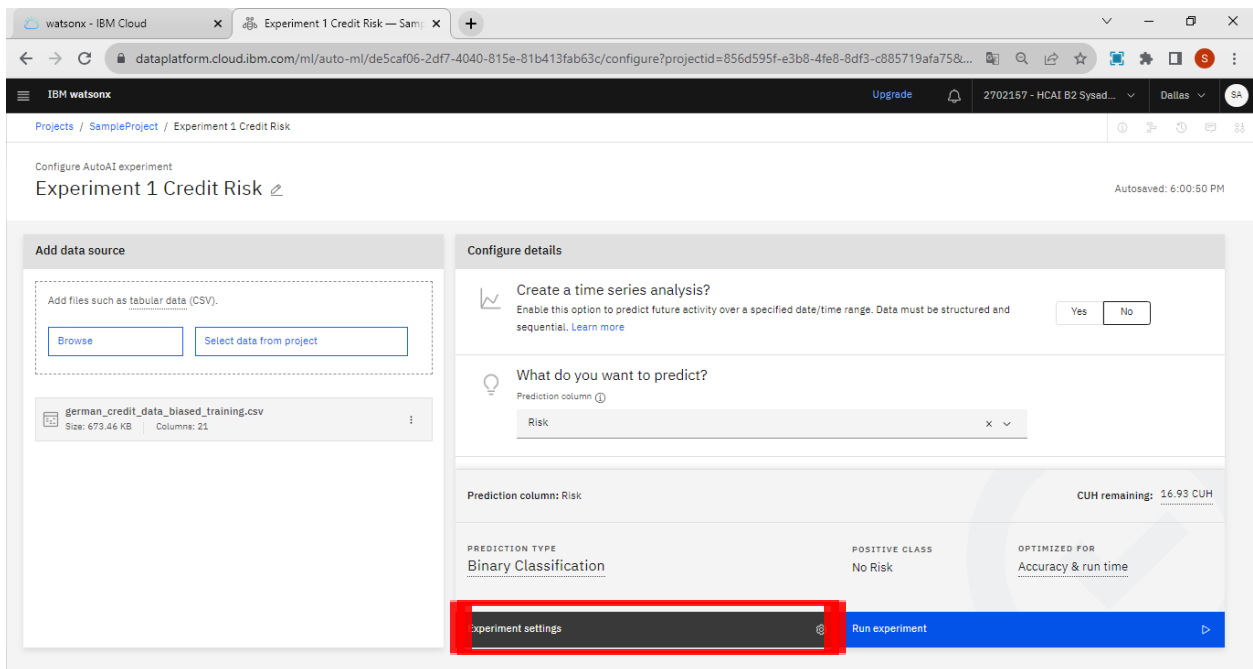
10. Pada bagian **Configure details** pilih **No** untuk opsi Create time series analysis



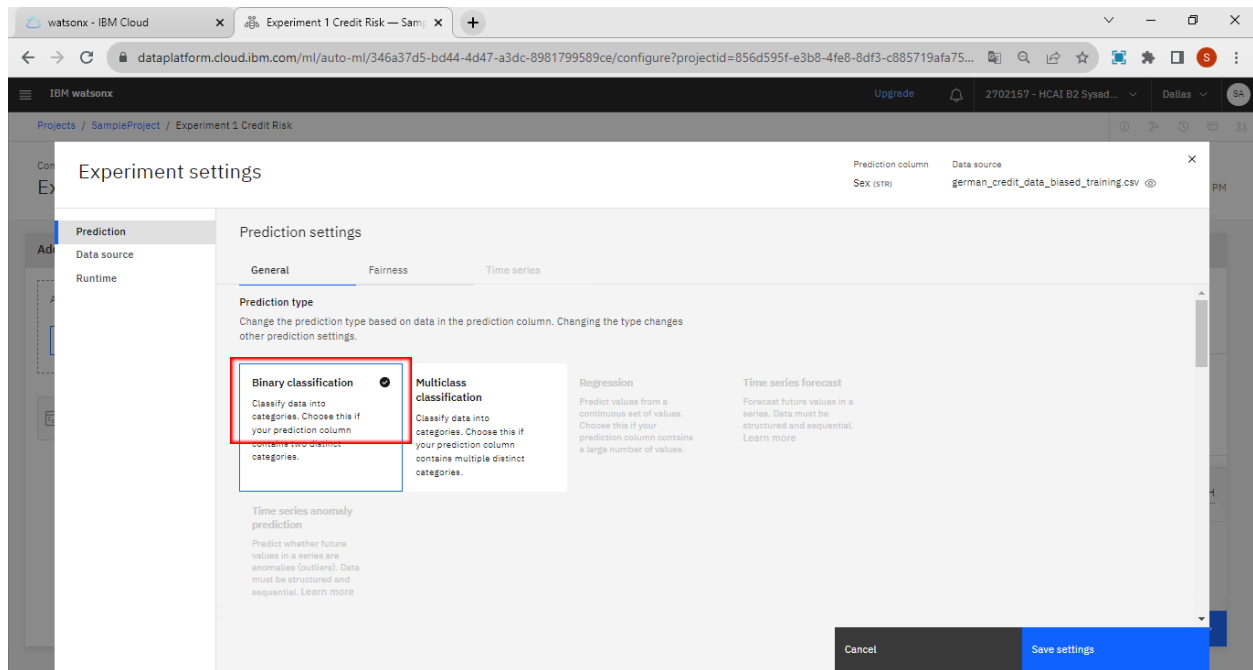
11. Selanjutnya, tentukan kategori yang akan digunakan dalam prediksi. Dalam kasus ini dipilih kategori **Risk** sebagai prediksi. Untuk bagian prediction column pilih data yang beresiko untuk menghasilkan esensi.



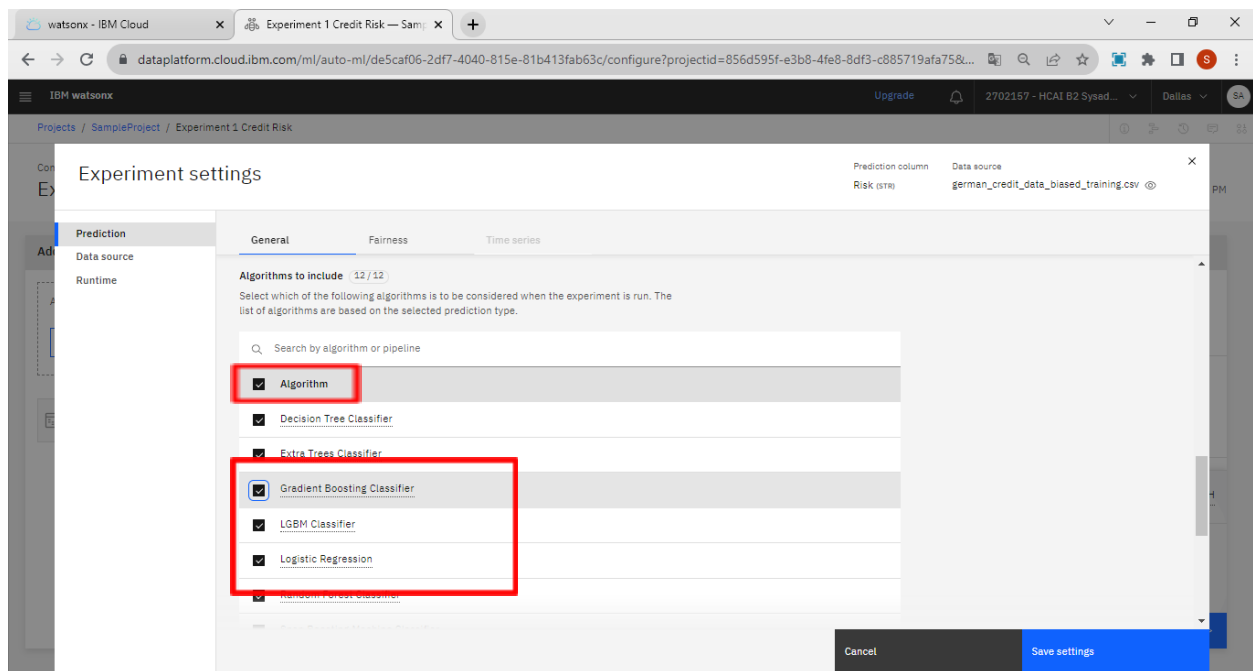
12. Halaman akan memunculkan tipe prediksi. pilih bagian **Experiment settings** untuk melakukan pengaturan lainnya.



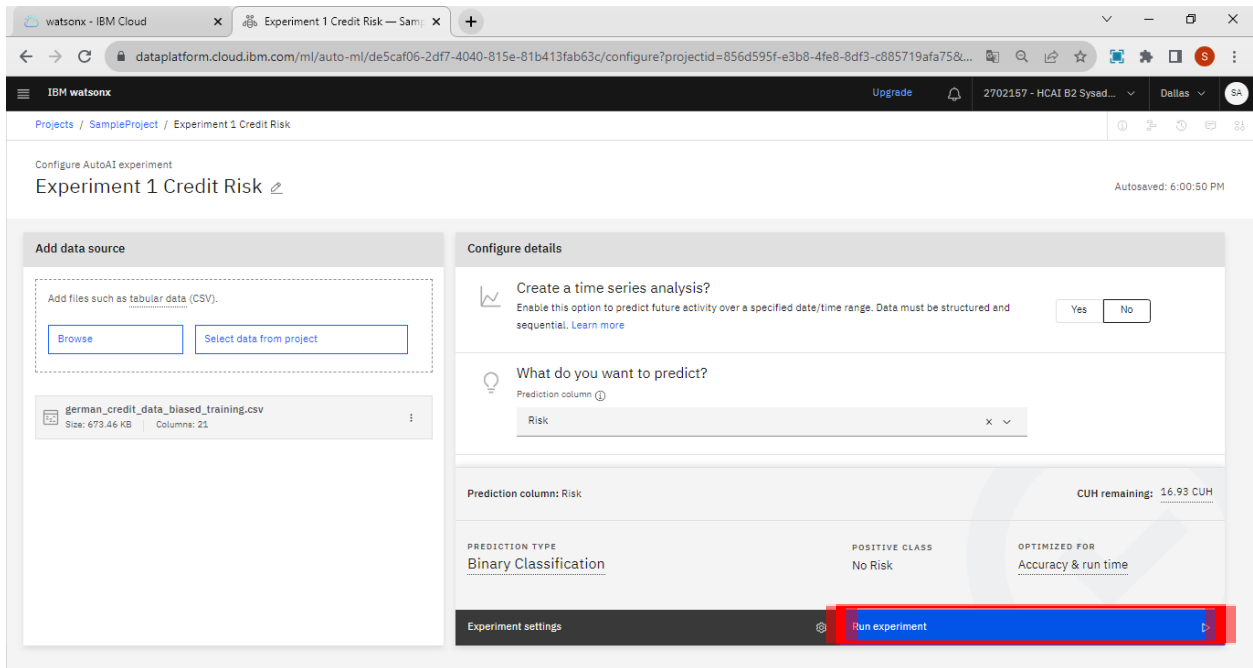
13. Pada bagian Experiment setting, kita bisa mengatur sendiri Prediction Type, algoritma yang dimasukkan dan algoritma yang digunakan. Pilih **Binary classification** berdasarkan rekomendasi Watsonx



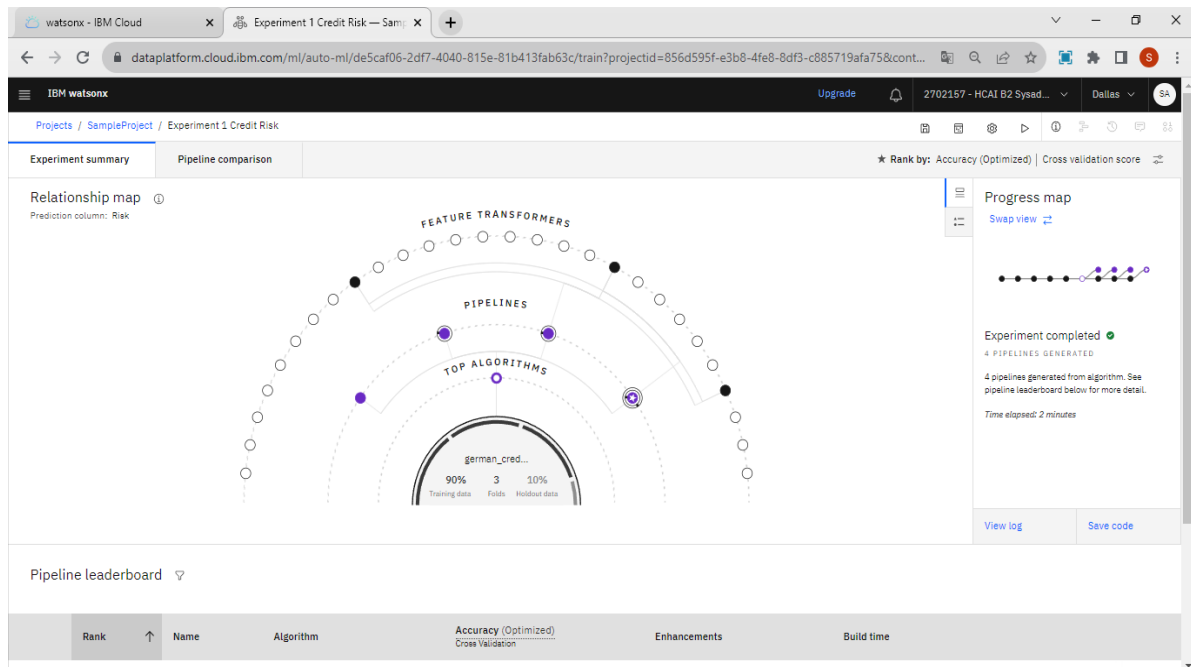
14. Checklis bagian **Algorithm** dan **Gradient Classifier**



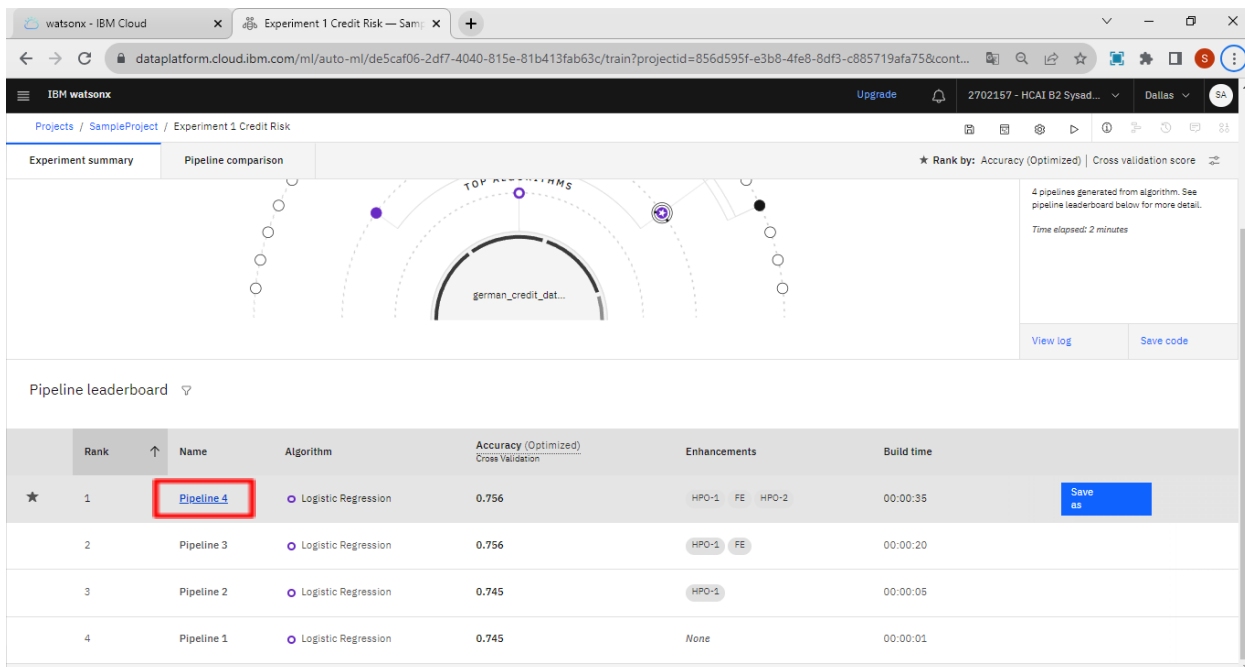
15. Selanjutnya scroll down untuk mengatur algoritma yang digunakan dengan memilih angka dari 1-4. semakin besar angka menandakan jumlah berapa banyak algoritma yang diklasifikasi dan hal tersebut membutuhkan cukup banyak waktu prediksi.
16. Simpan settingan dengan klik bagian **Save settings** kemudian **Run experiment**



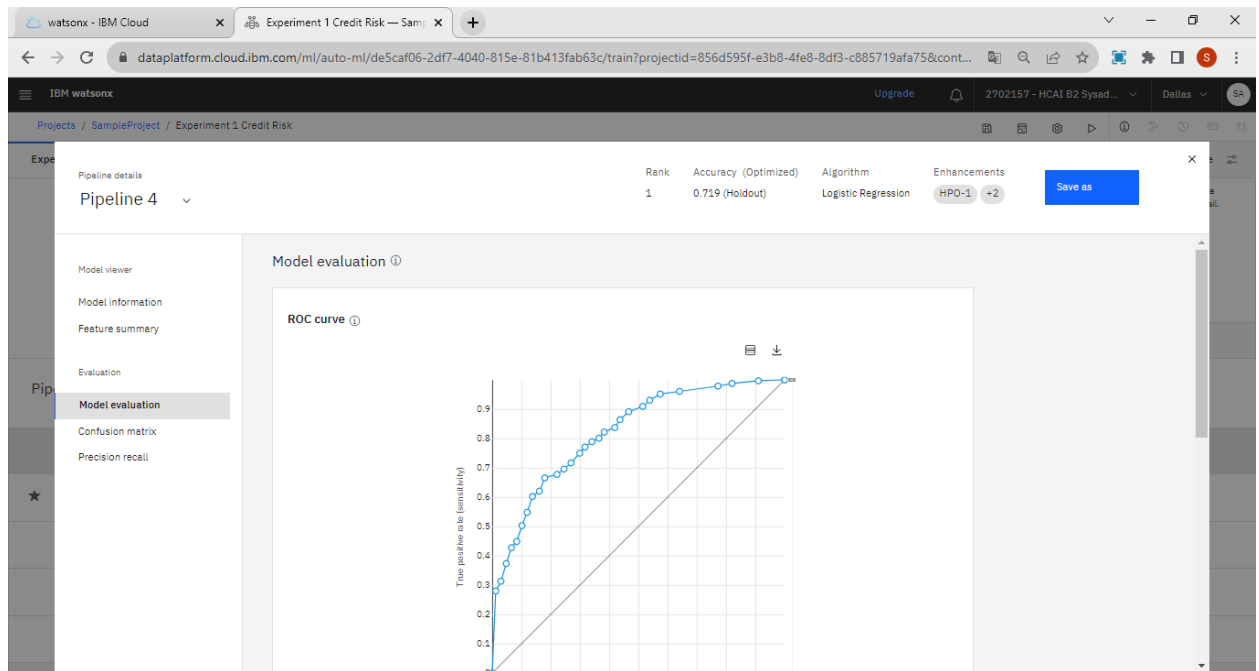
17. Saat model dilatih, infografis menunjukkan proses pembuatan pipelines. Hal ini membutuhkan beberapa waktu.



18. Pada saat pembuatan pipelines. Anda dapat membandingkan akurasi di papan peringkat Pipeline. Pilih **Pipeline4** yang menempati peringkat 1 untuk melihat detailnya.



19. Berikut ini merupakan isi dari Pipeline 4 (Top Performance). Anda bisa mereviewnya dan menganalisa pada Model Evaluation ini

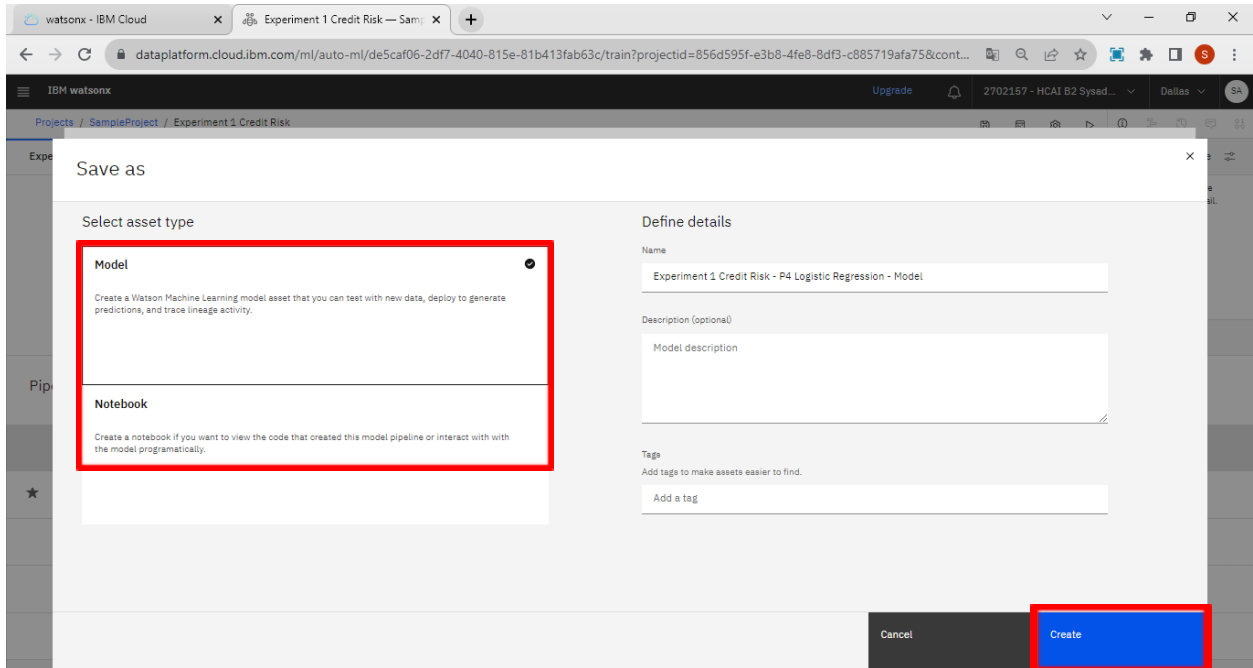


20. Pada menu Feature Summary bisa dilihat dan diperhatikan pada bagian Feature Importance mengidentifikasi fitur penting yang akan mempengaruhi hasil. Jika sudah Klik Save as

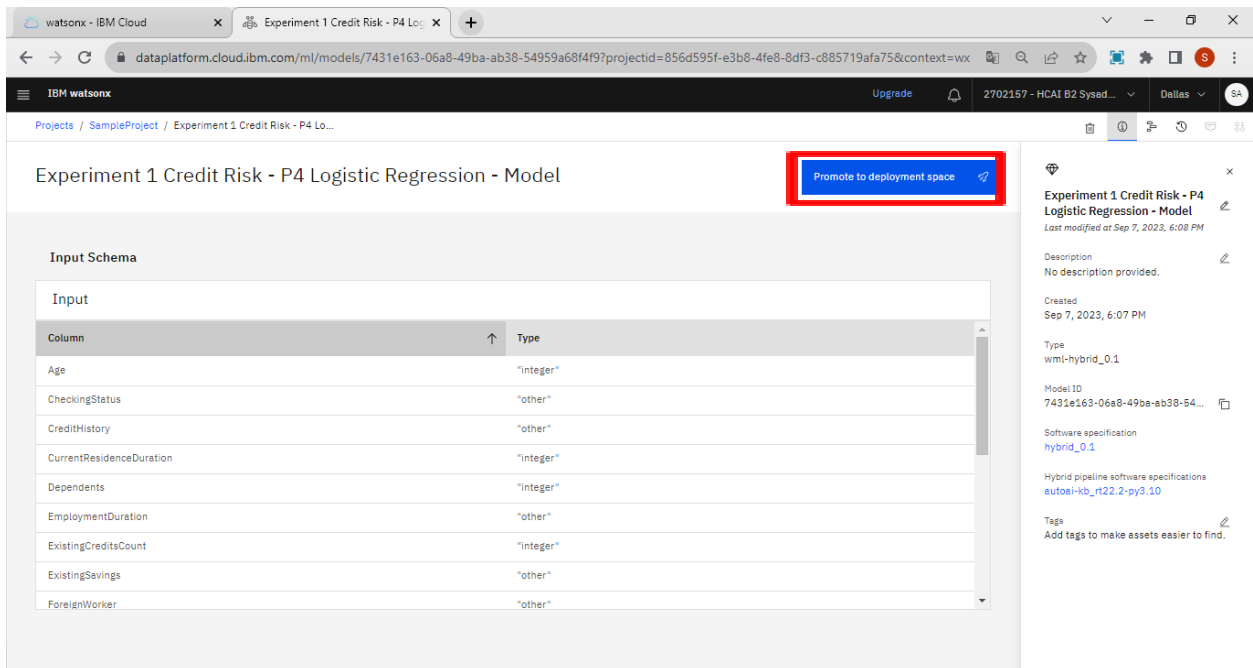
The screenshot shows the IBM Watsonx interface for Pipeline 4, specifically the 'Feature summary' section. The table lists features and their importance. The 'Save as' button is highlighted with a red box. The table has columns for 'Feature name', 'Transformation', and 'Feature importance'. The features are listed in descending order of importance.

Feature name	Transformation	Feature importance
NewFeature_2 Most improved	sum(Age,pca(ALL)[2])	100.00%
NewFeature_12	sum(pca(ALL)[4],Age)	87.00%
NewFeature_19	sum(pca(ALL)[16],Age)	86.00%
NewFeature_1	sum(Age,LoanDuration)	75.00%
LoanAmount	None	57.00%
NewFeature_3	sum(Age,pca(ALL)[4])	57.00%
NewFeature_4	sum(Age,pca(ALL)[9])	56.00%
NewFeature_16	sum(pca(ALL)[12],Age)	54.00%

21. Pilih bagian Model > Create



22. Kemudian pilih Promote to deployment space



23. Tentukan target space dengan pilih **Create a new deployment space**

Watsonx - IBM Cloud

Experiment 1 Credit Risk - P4 Lo...

dataplatform.cloud.ibm.com/ml/models/7431e163-06a8-49ba-ab38-54959a68f4f9?projectId=856d595f-e3b8-4fe8-8df3-c885719afa75&context=wx

IBM watsonx

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Projects / SampleProject / Experiment 1 Credit Risk - P4 Lo...

Promote to space

Use a deployment space to organize supporting resources such as input data and environments; deploy models or functions to generate predictions or solutions; and view or edit deployment details.

Target space

Select or create a space

Create a new deployment space

☐ Go to the model in the space after promoting it

Selected assets (1)

Name	Format
Experiment 1 Credit Risk - P4 Logistic Regression - Model	Model

Select version

Promoting a version of an asset to a space creates a new asset in the space, with a new asset ID.

Current

Cancel Promote

24. Masukkan **nama**, kaitkan dengan machine learning service kemudian pilih **Create**

Watsonx - IBM Cloud

Experiment 1 Credit Risk - P4 Lo...

dataplatform.cloud.ibm.com/ml/models/7431e163-06a8-49ba-ab38-54959a68f4f9?projectId=856d595f-e3b8-4fe8-8df3-c885719afa75&context=wx

IBM watsonx

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Projects / SampleProject / Experiment 1 Credit Risk - P4 Lo...

Create a deployment space

Use a space to collect assets in one place to create, run, and manage deployments

Define details

Name

Credit Risk

Description (Optional)

Deployment space description

Deployment space tags (optional)

Add a tag

Select services

Select storage service

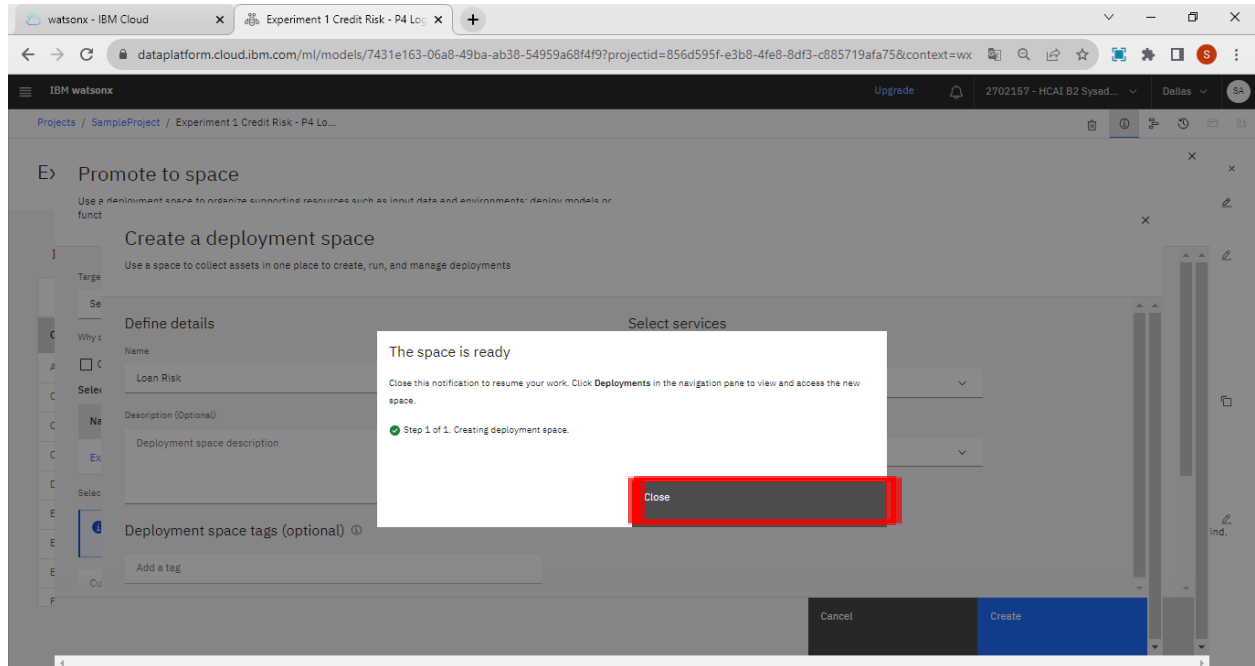
Cloud Object Storage-f2

Select machine learning service (optional)

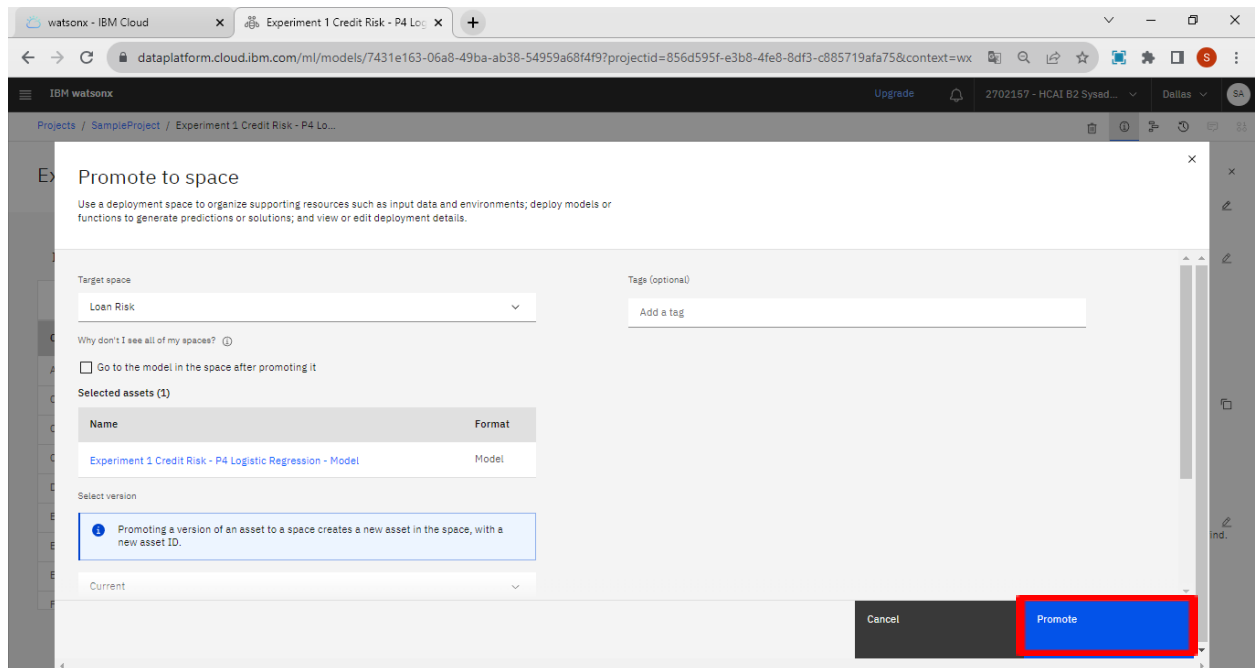
Select a machine learning service

Cancel Create

25. Pilih Close



26. Kemudian pada bagian promote to space dengan klik bagian **Promote**



27. Setelah melakukan promote to deployment space, akan muncul notifikasi yang menandakan proses deploy berhasil atau gagal. Klik **deployment space** pada bagian notifikasi

The screenshot shows the IBM Watsonx interface. A notification box in the top right corner states: "Success Successfully promoted Experiment 1 Credit Risk - P4 Logistic Regression - Model to the deployment space. Go to the deployment space to prepare the assets for deployment." The notification includes a timestamp of 6:11:59 PM. Below the notification, the "Input Schema" for the model is displayed. The schema lists the following columns and their types:

Column	Type
Age	"integer"
CheckingStatus	"other"
CreditHistory	"other"
CurrentResidenceDuration	"integer"
Dependents	"integer"
EmploymentDuration	"other"
ExistingCreditsCount	"integer"
ExistingSavings	"other"
ForeignWorker	"other"

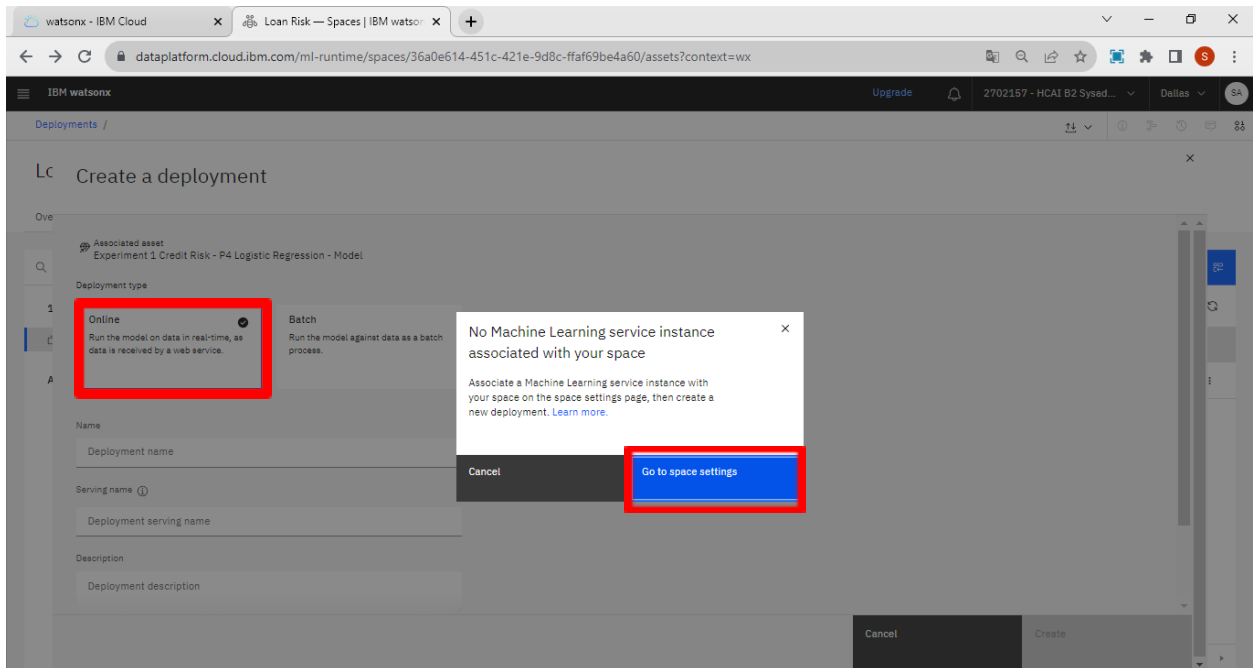
28. Pilih bagian **Assets** > klik titik tiga sebelah kanan pada model dan pilih **Deploy**

The screenshot shows the IBM Watsonx interface with the "Assets" tab selected. The "Assets" section displays a table with the following information:

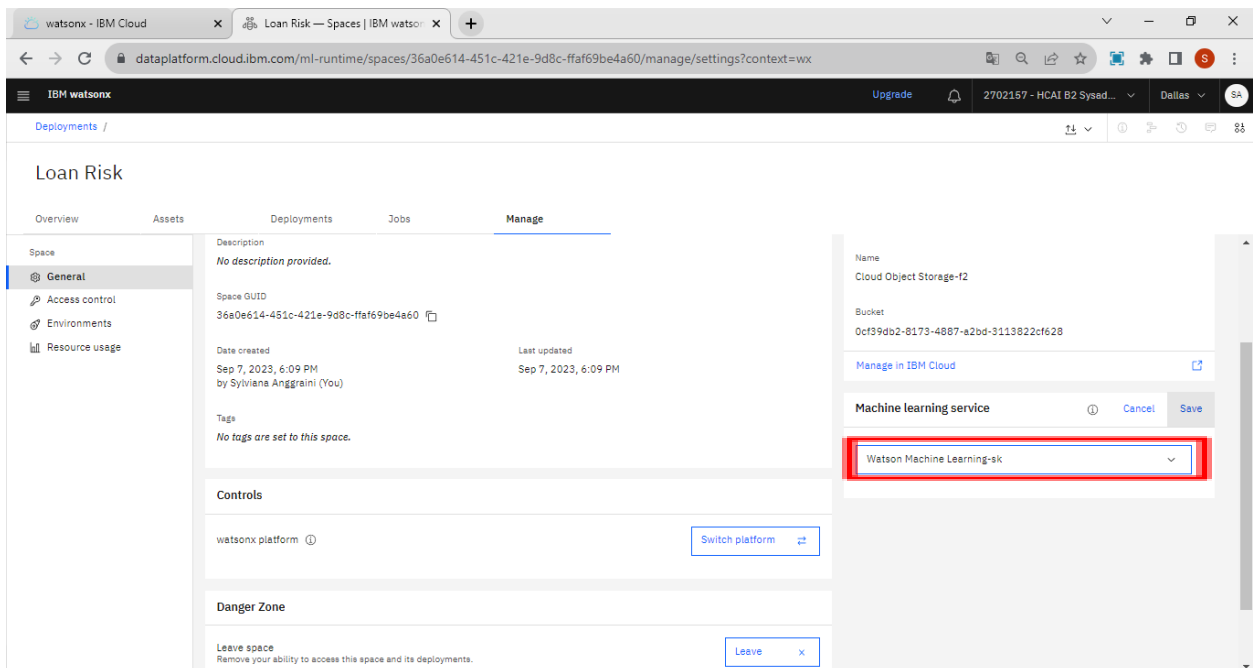
Name	Last modified
Experiment 1 Credit Risk - P4 Logistic Regression - Model	4 minutes ago

A "Deploy" button is highlighted in the top right corner of the table. The interface also shows a search bar, a "Find assets" button, and a "Deploy" button in the top right corner of the page.

29. Pada bagian Create a deployment pilih **Online** untuk tipe deployment, masukkan nama kemudian **Create > Go to space settings**



30. Pada bagian Machine Learning Service -> Select Watson Machine Learning



31. Selanjutnya klik ikon edit -> save

The screenshot shows the IBM Watsonx interface for a space named 'Loan Risk'. The 'Manage' tab is selected, displaying details such as the space name, description, GUID, and creation date. On the right, the 'Storage' section shows 13.6 KB of space used. Below this, the 'Machine learning service' section is visible, with a red box highlighting the edit icon (pencil) next to it.

32. Pada bagian assets pilih deploy

The screenshot shows the IBM Watsonx interface for the 'Loan Risk' space, specifically the 'Assets' tab. A search bar is at the top, and a list of assets is displayed below. The first asset is 'Experiment 1 Credit Risk - P4 Logistic Regression - Model'. A red box highlights the 'Deploy' button next to this asset. The 'Import assets' button is also visible in the top right corner.

33. Pilih Loan Risk Deployment pada bagian notifikasi

The screenshot shows the IBM Watsonx interface. The main panel displays a table of deployments. A notification box on the right indicates that the online deployment 'Loan Risk Deployment' is ready to accept requests.

Name	Type	Status	Tags	Last modified
Loan Risk Deployment	Online	Deployed		31 seconds ago Sylviana Anggraini (You)

Online deployment ready
The online deployment **Loan Risk Deployment** in space **Loan Risk** is ready to accept requests.
Today 6:19 PM

Created
Sep 7, 2023, 6:11 PM

Type
wmi-hybrid_0.1

Model ID
0f6a834c-2f69-4b81-aba7-433d8c...

Software specification
hybrid_0.1

Hybrid pipeline software specifications
autoai-kb_r122.2-py3.10

Description
No description provided.

Tags
Add tags to make assets easier to find.

Source asset details

34. Kemudian pilih bagian **Test** untuk melakukan testing data tersebut.

The screenshot shows the 'Test' section of the 'Loan Risk Deployment' interface. It includes a table for entering input data, with columns for various loan-related attributes. A 'Predict' button is visible at the bottom right.

Enter input data

Text input | JSON input

Enter data manually or use a CSV file to populate the spreadsheet. Max file size is 50 MB.

Download CSV template | Browse local files | Search in space | Clear all x

	CheckingStatus (other)	LoanDuration (integer)	CreditHistory (other)	LoanPurpose (other)	LoanAmount (integer)	ExistingSavings (other)	EmploymentDuration (other)	InstallmentPercent (integer)
1	Start typing or drag and drop a CSV file...							
2								
3								
4								
5								
6								
7								

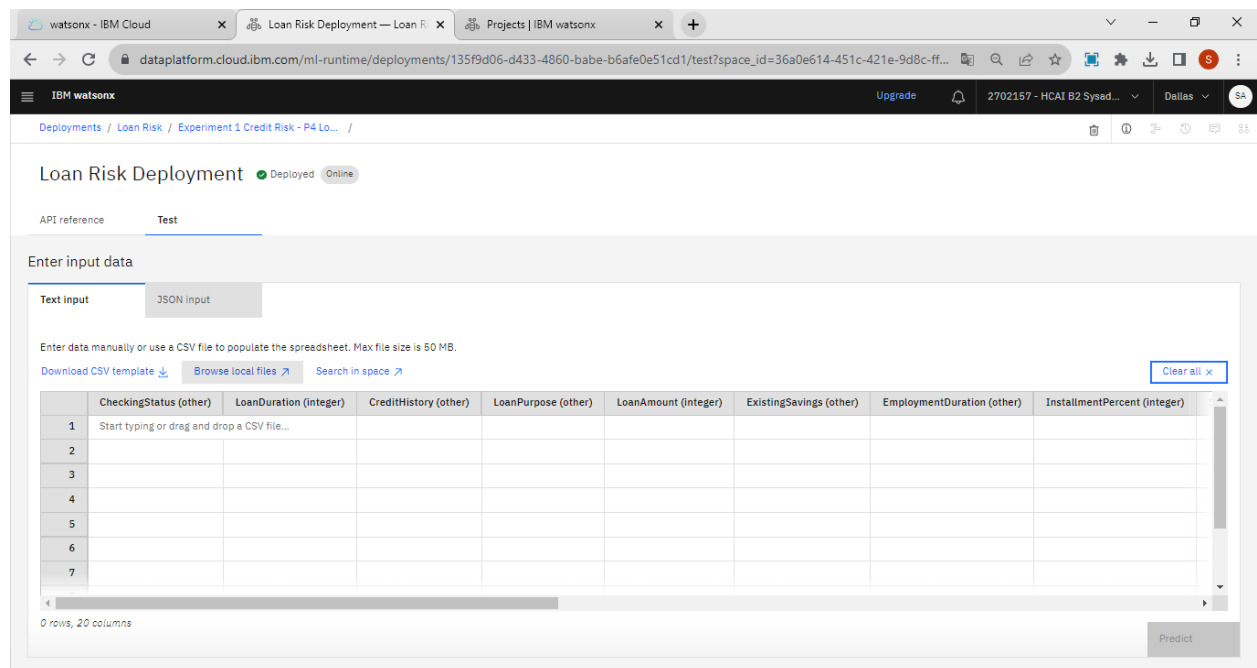
0 rows, 20 columns

Predict

35. Siapkan data setting untuk melakukan testing

Loan Risk Deployment_test_input.csv - Microsoft Excel (Product Activation Failed)																																																																							
File				Home				Insert				Page Layout				Formulas				Data				Review				View				Developer				Team																																			
Clipboard				Font				Alignment				Number				General				Conditional Formatting				Format as Table				Cell Styles				Insert				Delete				Format				Σ AutoSum				Sort & Filter				Find & Select																			
Paste				Cut				Copy				Format Painter				Clipboard				Font				Alignment				Number				General				Conditional Formatting				Format as Table				Cell Styles				Insert				Delete				Format				Σ AutoSum				Sort & Filter				Find & Select			
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A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U																																																			
1	Checking	LoanDurat	CreditHist	LoanPurp	LoanAmo	ExistingSa	Employm	Installme	Sex	OthersOn	CurrentRe	OwnsPro	Age	Installme	Housing	ExistingCr	Job	Depender	Telephon	ForeignWorker																																																			
2		31	credits_per	other	1889	100_to_50	less_1	3	female	none		3	savings_ir	32	none	own	1	skilled	1	none	yes																																																		
3		18	credits_per	car_new	462	less_100	1_to_4	2	female	none		2	savings_ir	37	stores	own	2	skilled	1	none	yes																																																		
4		15	prior_pay	furniture	250	less_100	1_to_4	2	male	none		3	real_estat	28	none	own	2	skilled	1	yes	no																																																		
5		28	credits_per	retraining	3693	less_100	greater_7	3	male	none		2	savings_ir	32	none	own	1	skilled	1	none	yes																																																		
6		28	prior_pay	education	6235	500_to_10	greater_7	3	male	none		3	unknown	57	none	own	2	skilled	1	none	yes																																																		
7		32	outstandi	vacation	9604	500_to_10	greater_7	6	male	co-applia		5	unknown	57	none	free	2	skilled	2	yes	yes																																																		
8		9	prior_pay	car_new	1032	100_to_50	4_to_7	3	male	none		4	savings_ir	41	none	own	1	managem	1	none	yes																																																		
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36. Masuk kembali ke bagian text input untuk copy data set nya



Loan Risk Deployment Deployed Online

API reference **Test**

Enter input data

Text input JSON input

Enter data manually or use a CSV file to populate the spreadsheet. Max file size is 50 MB.

[Download CSV template](#) [Browse local files](#) [Search in space](#) [Clear all](#)

	CheckingStatus (other)	LoanDuration (integer)	CreditHistory (other)	LoanPurpose (other)	LoanAmount (integer)	ExistingSavings (other)	EmploymentDuration (other)	InstallmentPercent (integer)
1	Start typing or drag and drop a CSV file...							
2								
3								
4								
5								
6								
7								

0 rows, 20 columns

Predict

Berikut data set yang sudah di copy di text input

IBM watsonx

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Deployments / Loan Risk / Experiment 1 Credit Risk - P4 Lo... /

Loan Risk Deployment Deployed Online

API reference **Test**

Enter input data

Text input JSON input

Enter data manually or use a CSV file to populate the spreadsheet. Max file size is 50 MB.

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	CheckingStatus (other)	LoanDuration (integer)	CreditHistory (other)	LoanPurpose (other)	LoanAmount (integer)	ExistingSavings (other)	EmploymentDuration (other)	InstallmentPercent (integer)
1		31	credits_paid_to_date	other	1889	100_to_500	less_1	3
2		18	credits_paid_to_date	car_new	462	less_100	1_to_4	2
3		15	prior_payments_delay	furniture	250	less_100	1_to_4	2
4		28	credits_paid_to_date	retraining	3693	less_100	greater_7	3
5		28	prior_payments_delay	education	6235	500_to_1000	greater_7	3
6		32	outstanding_credit	vacation	9604	500_to_1000	greater_7	6
7		9	prior_payments_delay	car_new	1032	100_to_500	4_to_7	3

7 rows, 20 columns

Predict

Berikut hasil dari prediksi menggunakan Watsonx pada Build machine learning models automatically.

Anda bisa mulai melakukan analisis dari hasil yang didapat maupun dari proses prediksinya.

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Prediction results

Prediction type: **Binary classification**

Display format for prediction results: ☒ Table view ☐ JSON view ☒ Show input data

Prediction percentage

7 Records

Confidence level distribution

	Prediction	Confidence	CheckingStatus	LoanDuration	CreditHistory	LoanPurpose
1	No Risk	57%		31	credits_paid_to_date	other
2	No Risk	66%		18	credits_paid_to_date	car_new
3	No Risk	61%		15	prior_payments_delay...	furniture
4	No Risk	72%		28	credits_paid_to_date	retraining
5	Risk	79%		28	prior_payments_delay...	education
6	Risk	95%		32	outstanding_credit	vacation
7	No Risk	56%		9	prior_payments_delay...	car_new
8						
9						
10						
11						
12						

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