
**Summer Internship Report**
**on**

# Model Evaluation Metrics

**Submitted by**

***Shreya :22csu515***
***Himanshi Yadav : 22csu085***
***Aashna Bansal :22csu006***

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING,
SCHOOL OF ENGINEERING AND TECHNOLOGY

THE NORTHCAP UNIVERSITY
GURUGRAM-122017

Internship Period:01/06/2014 TO 12/07/2024

*Copy of Certificate of completion ( issued by the industry you have done an internship )*

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**Date: 1st August, 24**

**TO WHOM SO EVER IT MAY CONCERN**

It is certified that **Shreya 22csu515** a student of **The NorthCap University,** has completed the **6-week summer Internship and Certification program** on Microsoft Azure Fundamental from 1st June to 12th July 2024 conducted by **Unique Training Solutions.**

We wish him/her all the best in his/her future endeavors.

**Authorized Signatory**
**(Unique Training Solutions)**

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# ABSTRACT

## Training Summary

**Location and Organization:**

The project was conducted at The Northcap University in Gurugram, Haryana.

**Training Goals:**

- Understand the basics of AI and ML.
- Develop basic projects using Microsoft Azure services.
- Prepare for and pass the AI-900 Microsoft Certification Exam.

**Activities:**

- Active Learning: Engaged in theoretical and practical sessions on AI/ML concepts.
- Project Work: Created and deployed AI/ML projects using Azure services.
- Azure Framework: Learned how to navigate and utilize Azure tools effectively.
- Exam Preparation: Focused on AI-900 exam structure and key concepts.

**Accomplishments:**

- Successfully passed the AI-900 Microsoft Certification Exam.
- Developed hands-on experience with Azure and a solid understanding of AI/ML fundamentals.
- Worked on a hands-on project on the topic Life Expectancy Prediction Model.

**Key Takeaways:**

**Technical:**

- Azure Proficiency: Gained familiarity with Azure tools for AI/ML projects.
- AI/ML Knowledge: Built a strong foundation in AI/ML concepts.

**Non-Technical:**

- Collaboration: Enhanced teamwork and knowledge-sharing skills.
- Time Management: Balanced study, project work, and exam prep efficiently.
- Communication: Improved the ability to explain technical concepts clearly.

This training provided essential skills in AI/ML and Azure, laying a strong foundation for future work.

# INTRODUCTION

**Company:** The training was carried out in collaboration with UTS (Unique Training Solution), a company specializing in providing educational and professional training services across various industries. UTS is known for its focus on enhancing the practical skills of students and professionals through tailored training programs that bridge the gap between academic learning and industry requirements.

**Location:** The training took place at The Northcap University in Gurugram, Haryana, which served as the primary facility for the training sessions. The university provided a conducive environment for hands-on learning and interaction with industry professionals from UTS.

**Position:** During the training, I held the position of an intern. This role involved engaging in a structured training program designed to develop practical skills and knowledge in key engineering areas.

**Engineering Areas:**

- Artificial Intelligence and Machine Learning (AI/ML): Gained foundational knowledge in AI and ML, including algorithms, data processing, and model development.
- Microsoft Azure Services: Worked with Azure's cloud computing services, focusing on deploying AI/ML models and understanding cloud infrastructure.
- Project Development: Participated in the end-to-end process of developing and implementing projects using AI/ML concepts and Azure tools.

This training provided valuable experience in applying engineering concepts to real-world scenarios, with a strong emphasis on emerging technologies and practical problem-solving.

# PROBLEM STATEMENT

**Objective:** Assess the effectiveness of various metrics in evaluating life expectancy prediction models. This includes identifying the best metrics for different types of models (e.g., linear regression, machine learning, survival analysis) and ensuring they meet practical needs.

Key Issues:

1. **Metric Selection:** Determine which evaluation metrics (e.g., MAE, MSE, RMSE, $R^2$) best reflect model accuracy and reliability.
2. **Suitability and Bias**: Evaluate the suitability of metrics for different models and check for potential biases in predictions.
3. **Practical Application:** Ensure metrics align with stakeholder needs and provide actionable insights for real-world applications

## SOCIAL RELEVANCE OF THE LIFE EXPECTANCY PREDICTION

1. **Public Health Planning:** Helps allocate resources and prepare for healthcare needs and aging populations.
2. **Insurance and Financial Planning:** Informs policy pricing and retirement planning, ensuring financial stability.
3. **Policy Development:** Guides the creation of effective policies on healthcare, retirement, and social services.
4. **Addressing Inequality:** Highlights disparities among groups, aiding targeted interventions to reduce health inequities.

5. **Community and Individual Decision-Making:** Supports informed choices about health behaviors and long-term planning.
6. **Economic Disparities:** Wealthier regions tend to have higher life expectancies due to better access to healthcare, education, and nutrition.

In summary, evaluating a life expectancy dataset through these metrics allows for a comprehensive understanding of how social, economic, and environmental factors influence health outcomes. This analysis is crucial for informing public health policies and interventions aimed at improving the overall well-being and life expectancy of populations.

# TRAINING DESCRIPTION

In this Internship, We have learned about Fundamentals of AI and How AI works:

Given below:-

a) We have learned about the workloads of AI in brief and how they works.
b) We have learned that how we can use various Microsoft Azure Services to create AI and also others services Data Analytics,Web development etc.
c) We worked on the hands-on-labs which give us exposure to practical understanding of AI worloads(Computer vision, Regression Analysis etc).
d) In this internship we have that how we can apply theoretical knowledge into real -world applications.

## Benefits

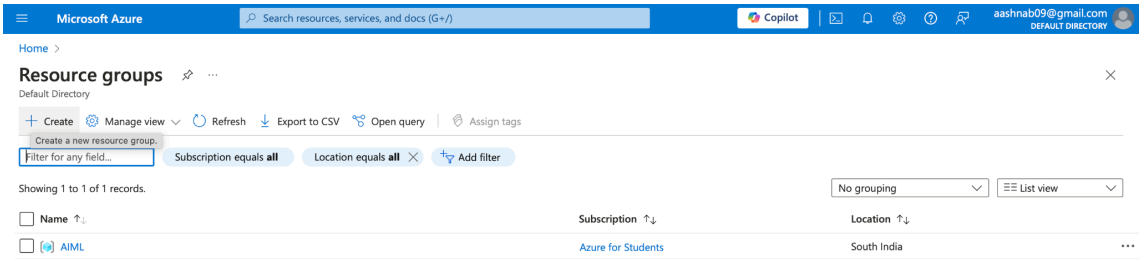
Real-World Experience: Gain hands-on experience that complements your academic studies.

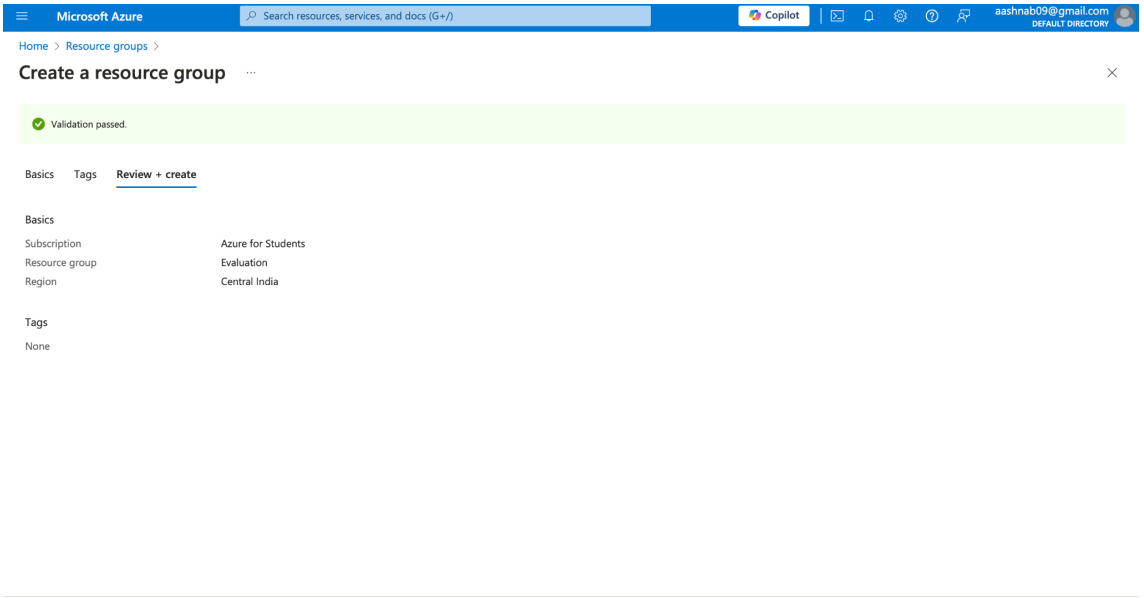
Skill Development: Enhance your professional skills and build your resume.

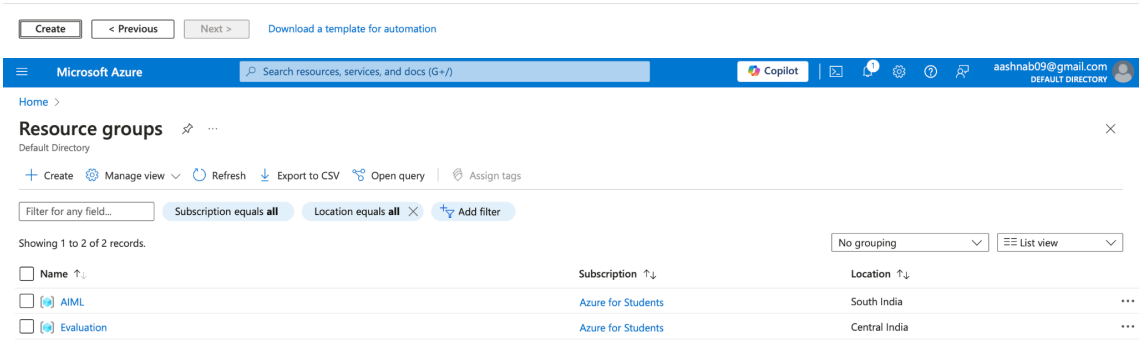
Career Exploration: Explore career paths and gain insight into the Artificial Intelligence

**PROJECT ON MODEL EVALUATION METRIC**

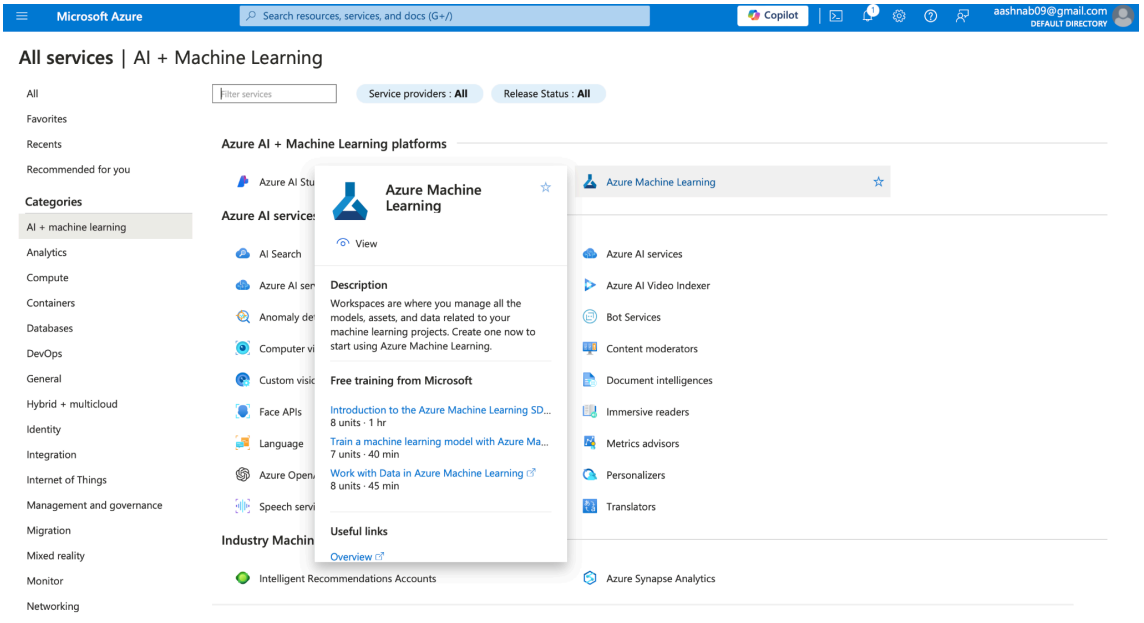
In this internship we have worked on hands-on-project. Title of our project is Model Evaluation metric. In this we have taken Data taken of Life Expectancy and Trained our model and Deployed it .




Step 2:- We made Azure Machine learning Studio For AI.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Integration
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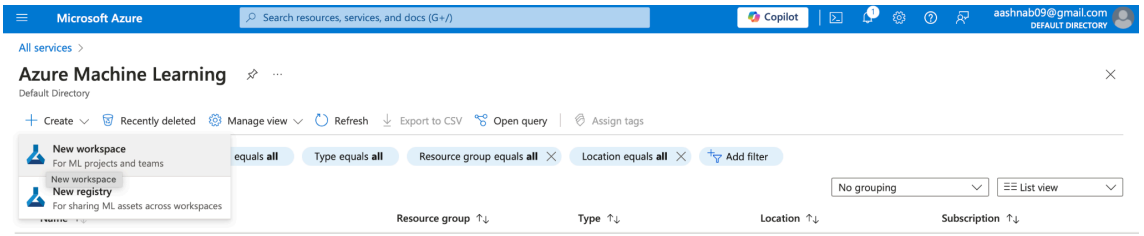
Networking
Filter services
Service providers : All
Release Status : All
Azure AI + Machine Learning platforms
Azure Machine Learning
Azure AI services:
AI Search
Azure AI services
Azure AI Video Indexer
Bot Services
Content moderators
Document intelligences
Immersive readers
Metrics advisors
Personalizers
Translators
Face APIs
Language
Industry Machin
Intelligent Recommendations Accounts
Azure Synapse Analytics
View
Description
Workspaces are where you manage all the models, assets, and data related to your machine learning projects. Create one now to start using Azure Machine Learning.
Free training from Microsoft
Introduction to the Azure Machine Learning SD...
8 units · 1 hr
Train a machine learning model with Azure Ma...
7 units · 40 min
Work with Data in Azure Machine Learning
8 units · 45 min
Useful links
Overview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Azure Machine Learning
Default Directory
Create
Recently deleted
Manage view
Refresh
Export to CSV
Open query
Assign tags
New workspace
For ML projects and teams
New workspace
New registry
For sharing ML assets across workspaces
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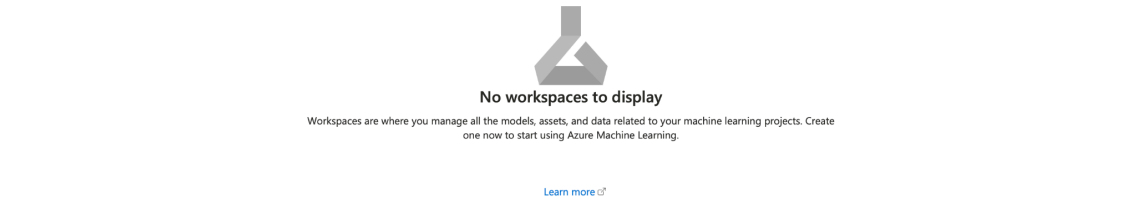
Type equals all
Resource group equals all
Location equals all
Add filter
No grouping
List view
Resource group
Type
Location
Subscription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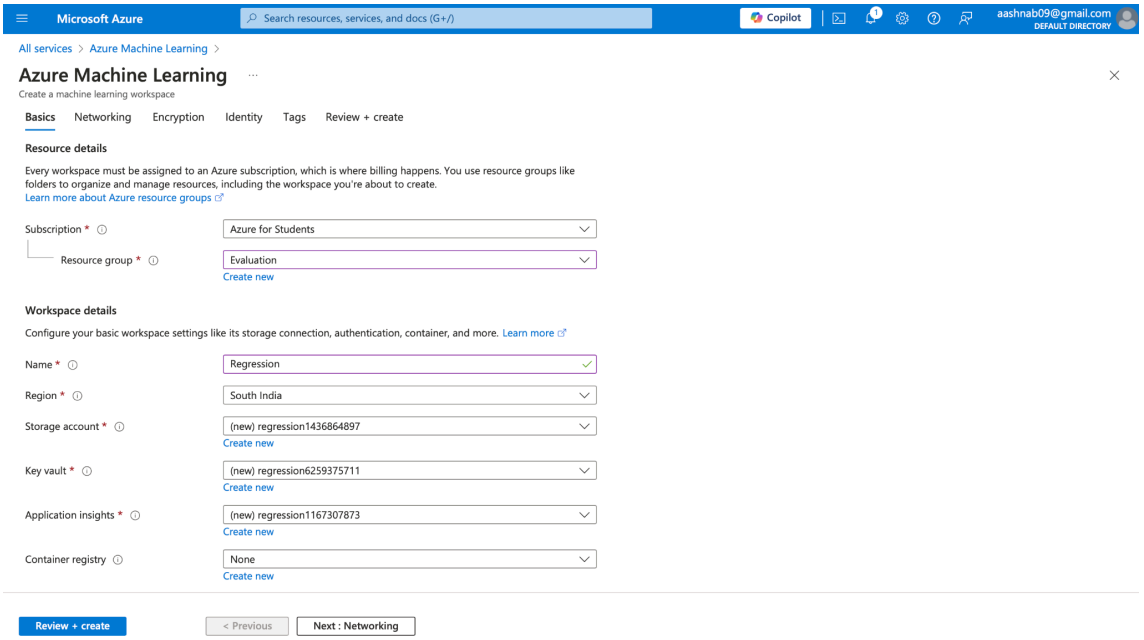
Workspaces are where you manage all the models, assets, and data related to your machine learning projects. Create one now to start using Azure Machine Learning.
Learn more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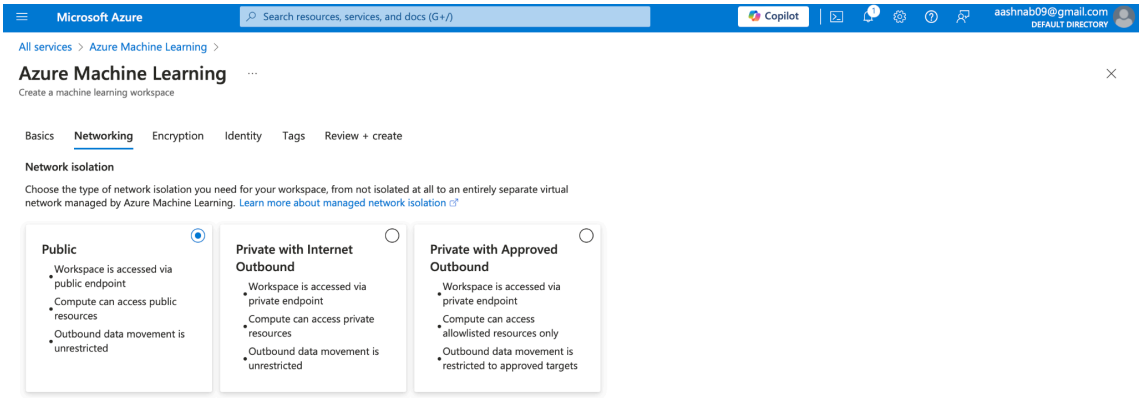
Azure Machine Learning
Create a machine learning workspace
Basics
Networking
Encryption
Identity
Tags
Review + create
Resource details
Every workspace must be assigned to an Azure subscription, which is where billing happens. You use resource groups like folders to organize and manage resources, including the workspace you're about to create.
Learn more about Azure resource groups
Subscription *
Azure for Students
Resource group *
Evaluation
Create new
Workspace details
Configure your basic workspace settings like its storage connection, authentication, container, and more. Learn more
Name *
Regression
Region *
South India
Storage account *
(new) regression1436864897
Create new
Key vault *
(new) regression6259375711
Create new
Application insights *
(new) regression1167307873
Create new
Container registry
None
Create new
Review + create
< Previous
Next : Networking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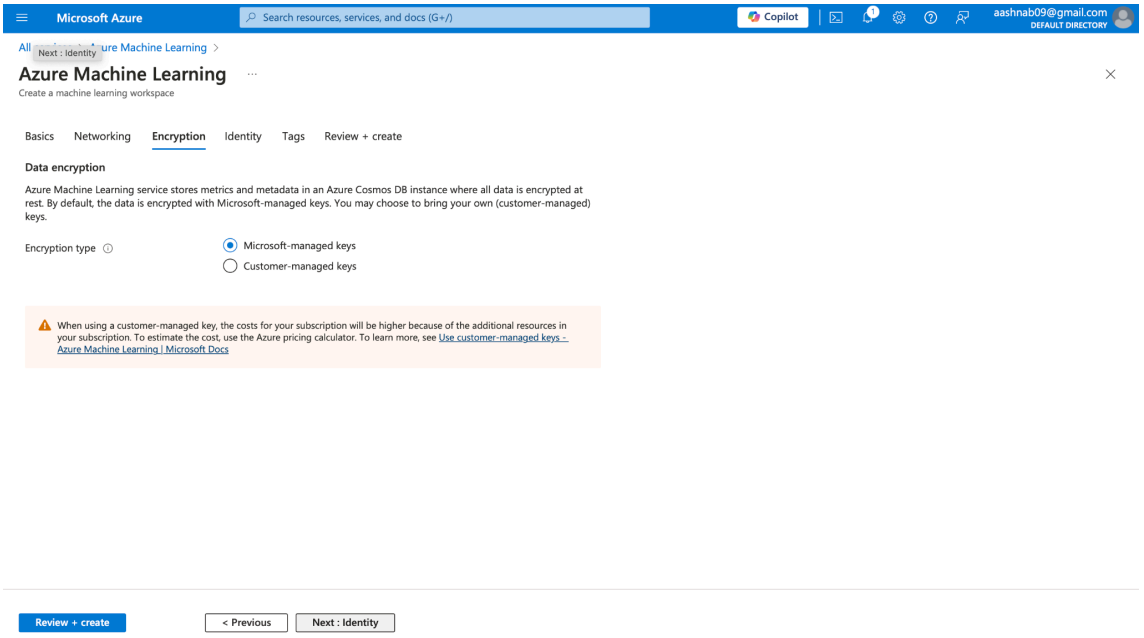
Azure Machine Learning
Create a machine learning workspace
Basics Networking Encryption Identity Tags Review + create
Network isolation
Choose the type of network isolation you need for your workspace, from not isolated at all to an entirely separate virtual network managed by Azure Machine Learning. Learn more about managed network isolation
Public
Workspace is accessed via public endpoint
Compute can access public resources
Outbound data movement is unrestricted
Private with Internet Outbound
Workspace is accessed via private endpoint
Compute can access private resources
Outbound data movement is unrestricted
Private with Approved Outbound
Workspace is accessed via private endpoint
Compute can access allowlisted resources only
Outbound data movement is restricted to approved targets
Review + create
< Previous
Next : Encryption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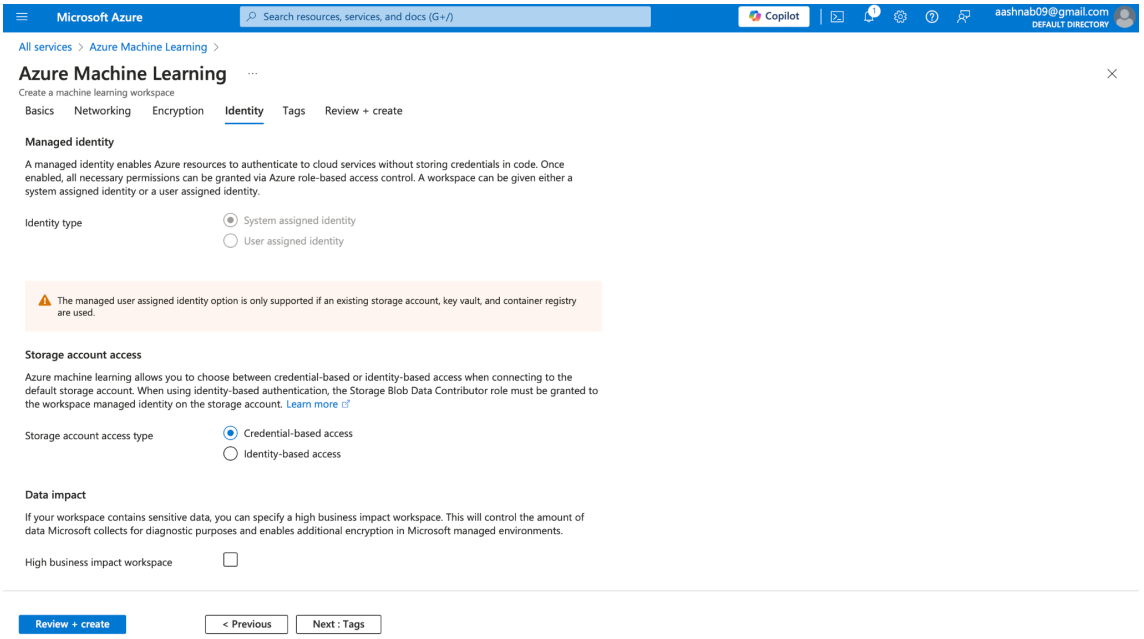
Next : Identity
Azure Machine Learning
Create a machine learning workspace
Basics Networking Encryption Identity Tags Review + create
Data encryption
Azure Machine Learning service stores metrics and metadata in an Azure Cosmos DB instance where all data is encrypted at rest. By default, the data is encrypted with Microsoft-managed keys. You may choose to bring your own (customer-managed) keys.
Encryption type
Microsoft-managed keys
Customer-managed keys
When using a customer-managed key, the costs for your subscription will be higher because of the additional resources in your subscription. To estimate the cost, use the Azure pricing calculator. To learn more, see Use customer-managed keys - Azure Machine Learning | Microsoft Docs
Review + create
< Previous
Next : Identity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Managed identity
A managed identity enables Azure resources to authenticate to cloud services without storing credentials in code. Once enabled, all necessary permissions can be granted via Azure role-based access control. A workspace can be given either a system assigned identity or a user assigned identity.
Identity type
System assigned identity
User assigned identity
The managed user assigned identity option is only supported if an existing storage account, key vault, and container registry are used.
Storage account access
Azure machine learning allows you to choose between credential-based or identity-based access when connecting to the default storage account. When using identity-based authentication, the Storage Blob Data Contributor role must be granted to the workspace managed identity on the storage account. Learn more
Storage account access type
Credential-based access
Identity-based access
Data impact
If your workspace contains sensitive data, you can specify a high business impact workspace. This will control the amount of data Microsoft collects for diagnostic purposes and enables additional encryption in Microsoft managed environments.
High business impact workspace
Review + create
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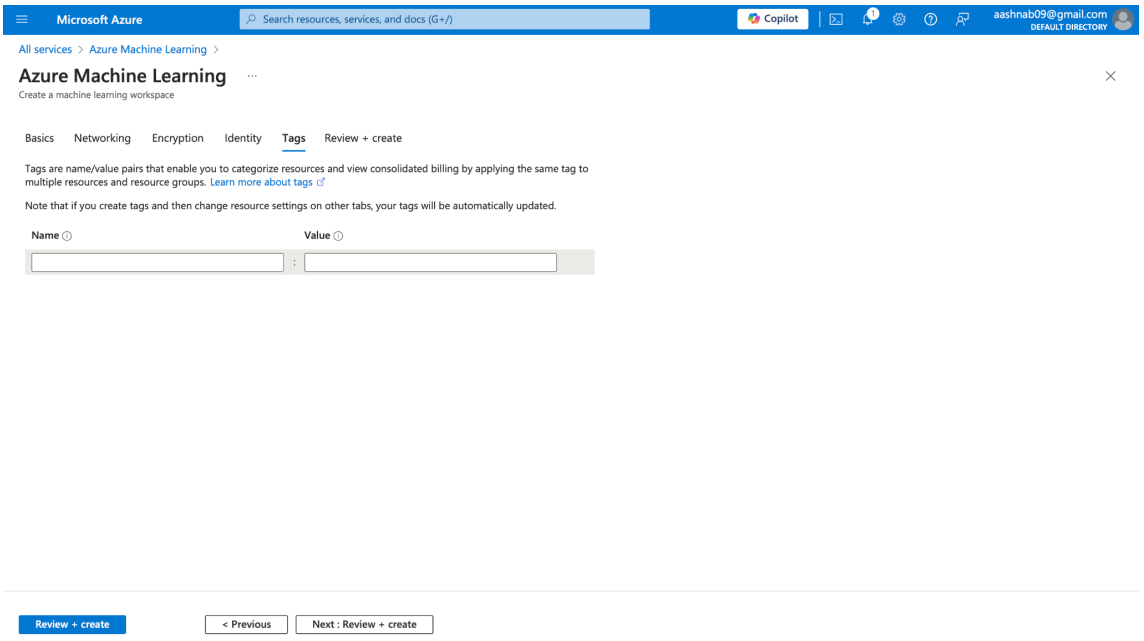
Next : Tags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Azure Machine Learning
Create a machine learning workspace
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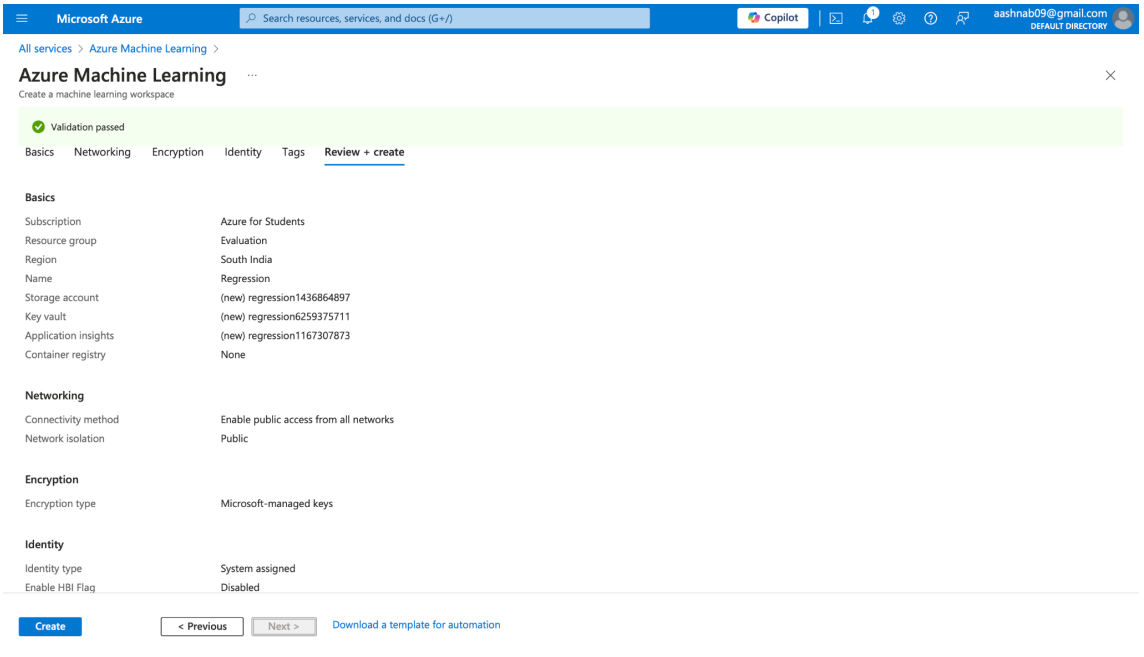
Tags are name/value pairs that enable you to categorize resources and view consolidated billing by applying the same tag to multiple resources and resource groups. Learn more about tags
Note that if you create tags and then change resource settings on other tabs, your tags will be automatically updated.
Name
Value
Review + create
< Previous
Next : Review + create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Azure Machine Learning
Create a machine learning workspace
Validation passed
Basics Networking Encryption Identity Tags Review + create
Basics
Subscription Azure for Students
Resource group Evaluation
Region South India
Name Regression
Storage account (new) regression1436864897
Key vault (new) regression6259375711
Application insights (new) regression1167307873
Container registry None
Networking
Connectivity method Enable public access from all networks
Network isolation Public
Encryption
Encryption type Microsoft-managed keys
Identity
Identity type System assigned
Enable HBI Flag Disabled
Create
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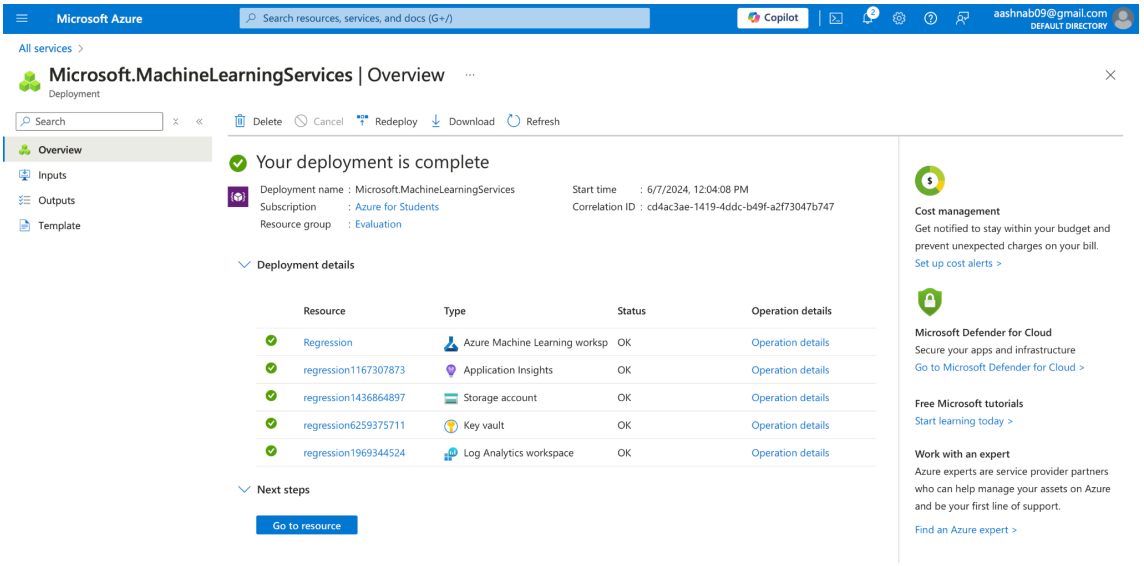
Next >
Download a template for automation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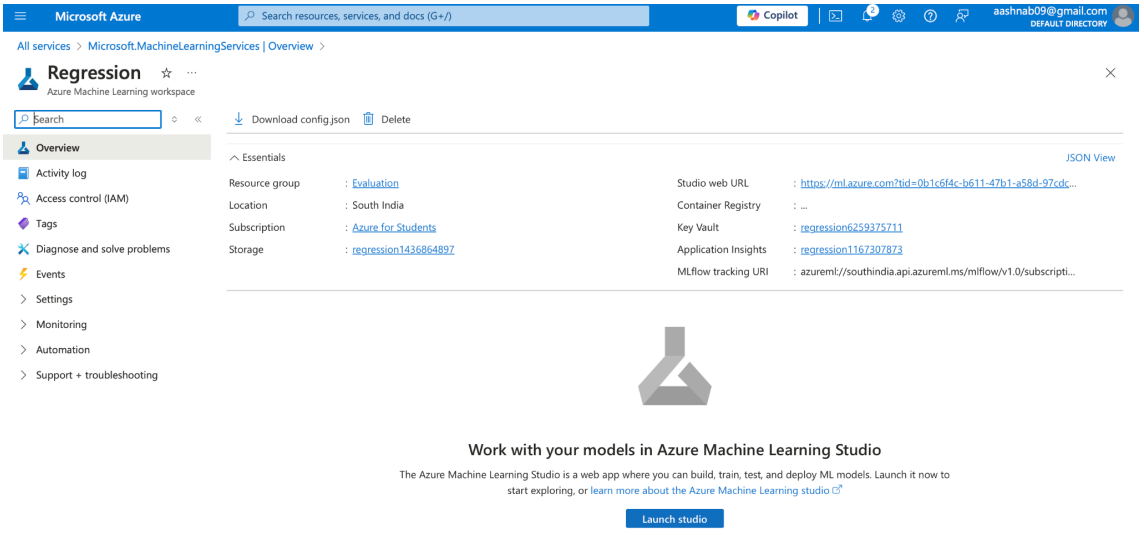
Microsoft.MachineLearningServices | Overview
Deployment
Search
Overview
Inputs
Outputs
Template
Delete
Cancel
Redeploy
Download
Refresh
Your deployment is complete
Deployment name : Microsoft.MachineLearningServices
Subscription : Azure for Students
Resource group : Evaluation
Start time : 6/7/2024, 12:04:08 PM
Correlation ID : cd4ac3ae-1419-4ddc-b49f-a2f73047b747
Deployment details
Resource Type Status Operation details
Regression Azure Machine Learning worksp OK Operation details
regression1167307873 Application Insights OK Operation details
regression1436864897 Storage account OK Operation details
regression6259375711 Key vault OK Operation details
regression1969344524 Log Analytics workspace OK Operation details
Next steps
Go to resource
Cost management
Get notified to stay within your budget and prevent unexpected charges on your bill.
Set up cost alerts >
Microsoft Defender for Cloud
Secure your apps and infrastructure
Go to Microsoft Defender for Cloud >
Free Microsoft tutorials
Start learning today >
Work with an expert
Azure experts are service provider partners who can help manage your assets on Azure and be your first line of support.
Find an Azure expert >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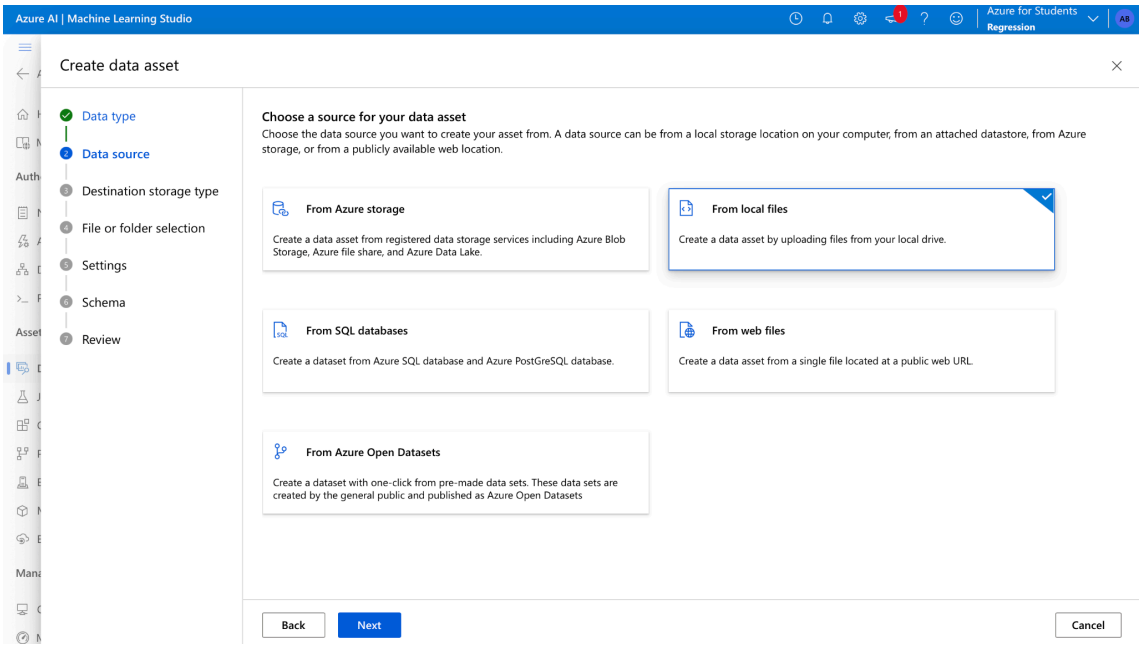
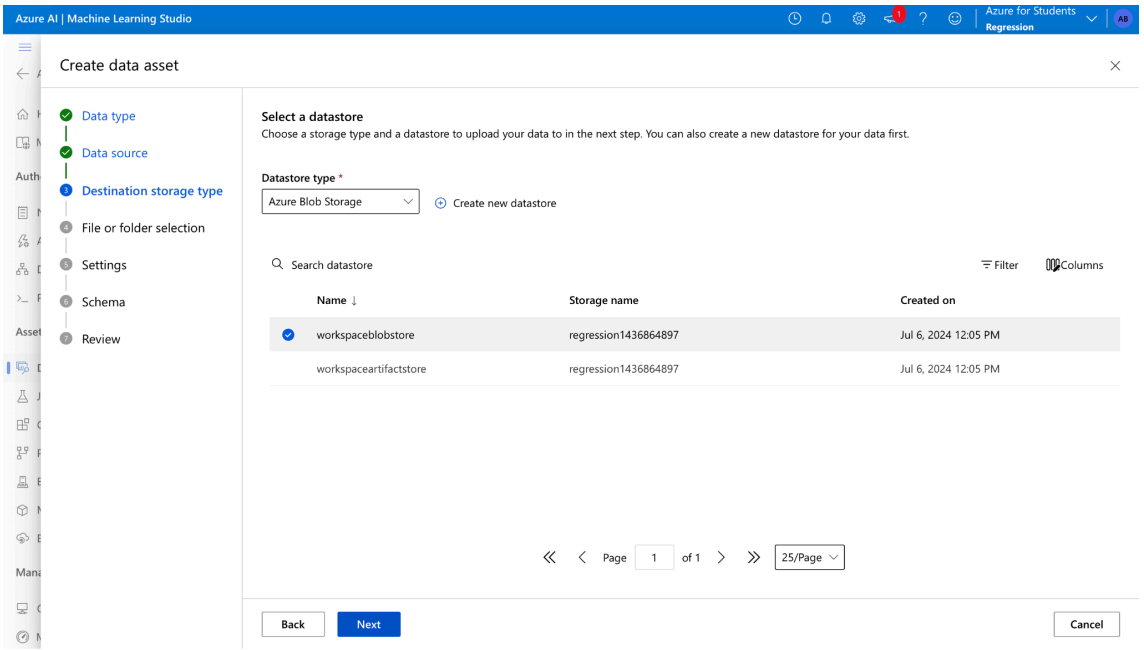
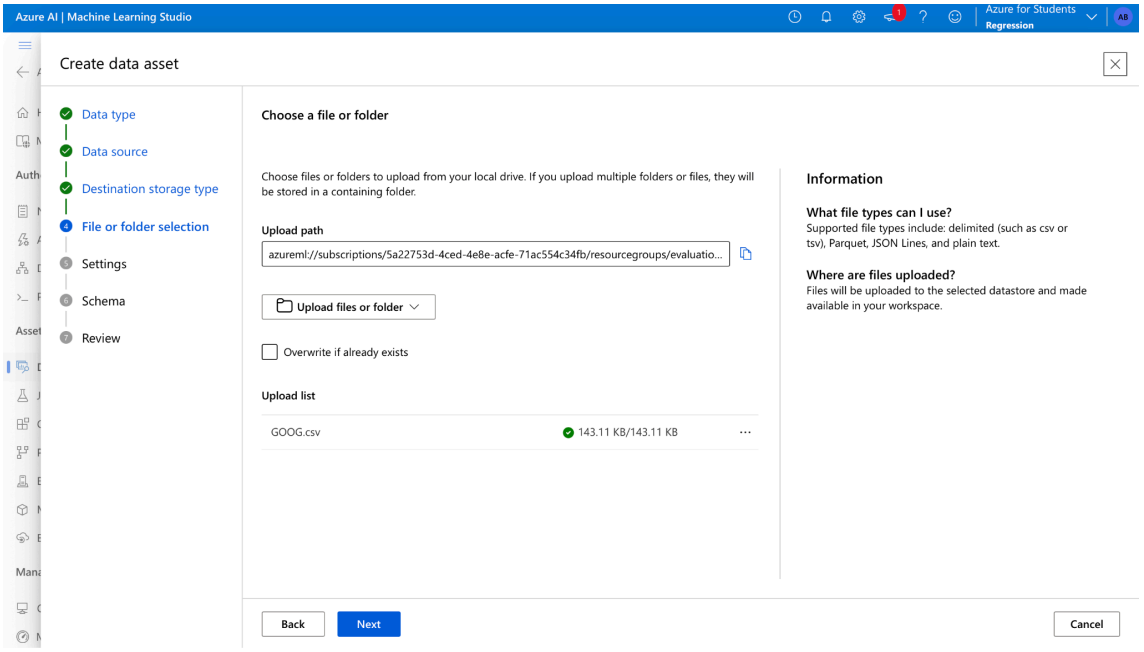
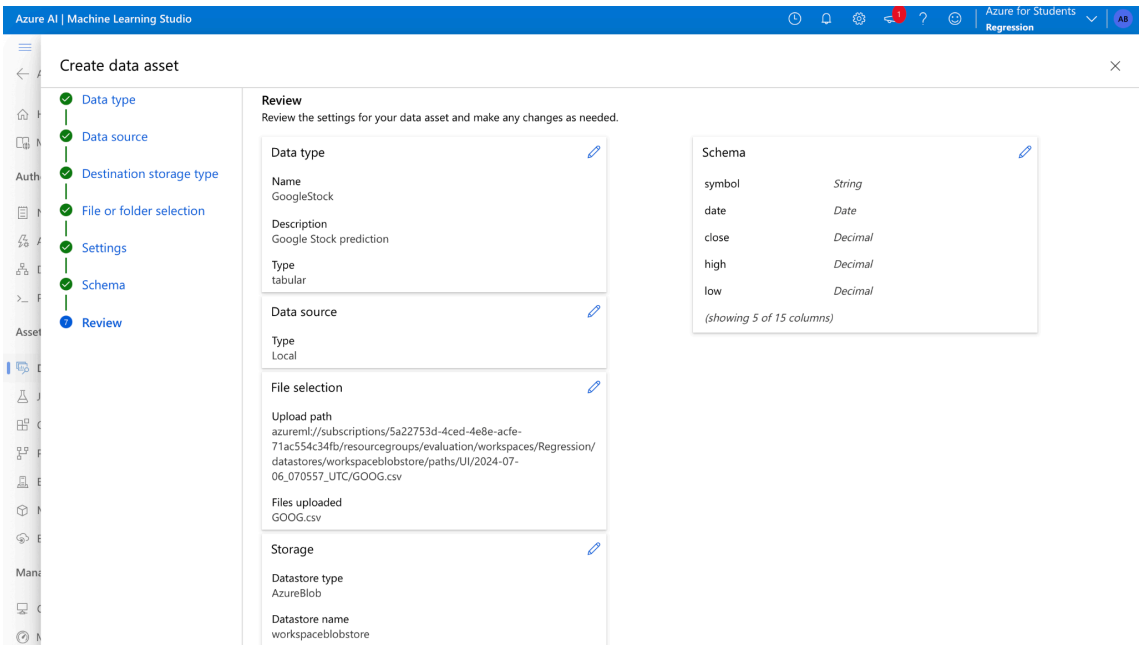
Regression
Azure Machine Learning workspace
Search
Overview
Activity log
Access control (IAM)
Tags
Diagnose and solve problems
Events
Settings
Monitoring
Automation
Support + troubleshooting
Download config.json
Delete
Essentials
JSON View
Resource group : Evaluation
Location : South India
Subscription : Azure for Students
Storage : regression1436864897
Studio web URL : https://ml.azure.com?tid=0b1c6f4c-b611-47b1-a58d-97cdc...
Container Registry : ...
Key Vault : regression6259375711
Application Insights : regression1167307873
MLflow tracking URI : azureml://southindia.api.azureml.ms/mlflow/v1.0/subscripti...
Work with your models in Azure Machine Learning Studio
The Azure Machine Learning Studio is a web app where you can build, train, test, and deploy ML models. Launch it now to start exploring, or learn more about the Azure Machine Learning studio
Launch studio

Step 3:- In this we created our data and assigned Job to train our model in Automated ML.




Azure AI | Machine Learning Studio
Azure for Students
Regression
Create data asset
Data type
Data source
Destination storage type
File or folder selection
Settings
Schema
Review
Choose a file or folder
Choose files or folders to upload from your local drive. If you upload multiple folders or files, they will be stored in a containing folder.
Upload path
azureml://subscriptions/5a22753d-4ced-4e8e-acfe-71ac554c34fb/resourcegroups/evaluatio...
Upload files or folder
Overwrite if already exists
Upload list
GOOG.csv
143.11 KB/143.11 KB
Information
What file types can I use?
Supported file types include: delimited (such as csv or tsv), Parquet, JSON Lines, and plain text.
Where are files uploaded?
Files will be uploaded to the selected datastore and made available in your workspace.
Back
Next
Cancel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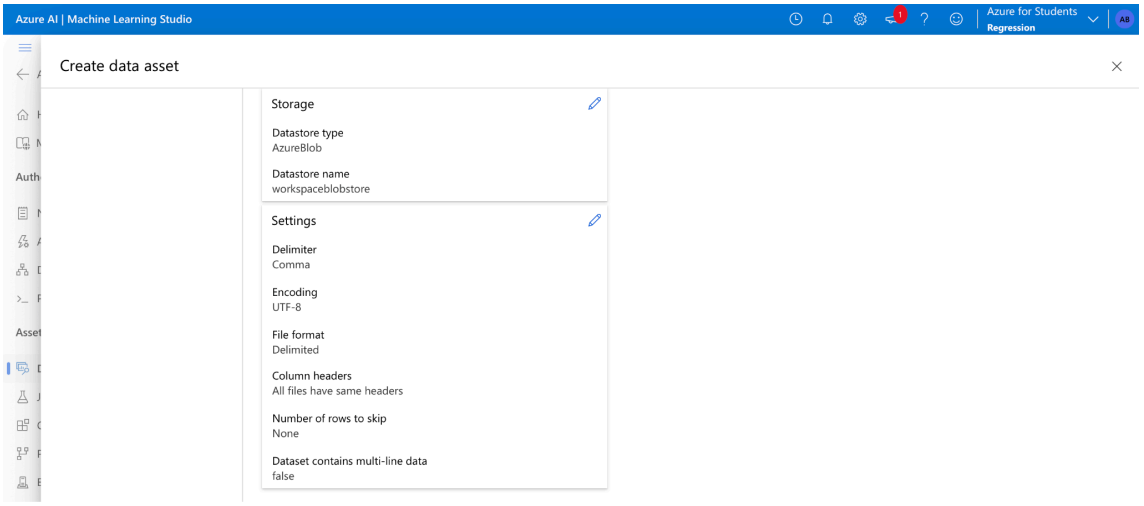
Regression
Create data asset
Data type
Data source
Destination storage type
File or folder selection
Settings
Schema
Review
Review
Review the settings for your data asset and make any changes as needed.
Data type
Name
GoogleStock
Description
Google Stock prediction
Type
tabular
Data source
Type
Local
File selection
Upload path
azureml://subscriptions/5a22753d-4ced-4e8e-acfe-71ac554c34fb/resourcegroups/evaluation/workspaces/Regression/datastores/workspaceblobstore/paths/UI/2024-07-06_070557_UTC/GOOG.csv
Files uploaded
GOOG.csv
Storage
Datastore type
AzureBlob
Datastore name
workspaceblobstore
Schema
symbol String
date Date
close Decimal
high Decimal
low Decimal
(showing 5 of 15 columns)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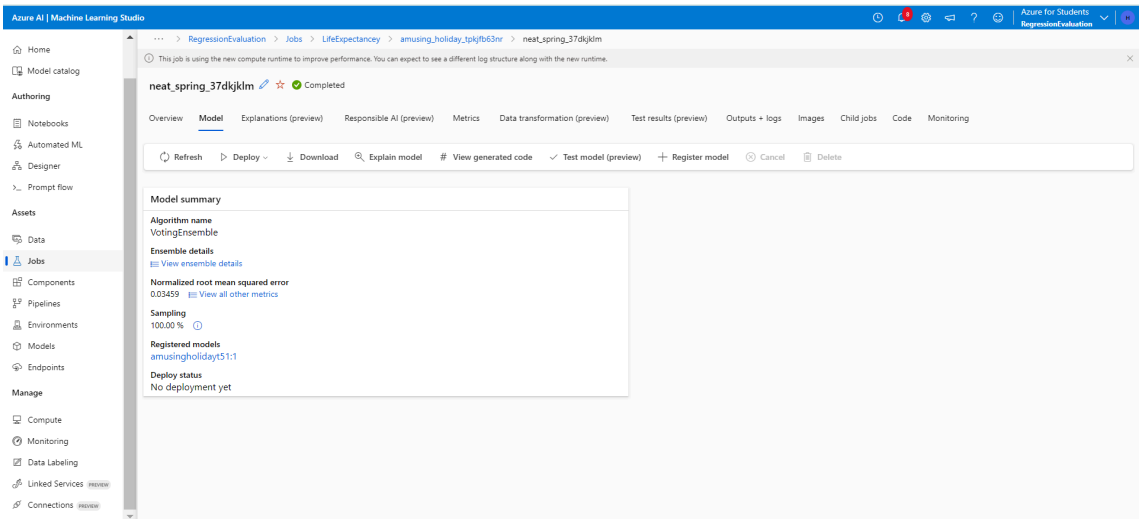
Regression
Create data asset
Storage
Datastore type
AzureBlob
Datastore name
workspaceblobstore
Settings
Delimiter
Comma
Encoding
UTF-8
File format
Delimited
Column headers
All files have same headers
Number of rows to skip
None
Dataset contains multi-line data
false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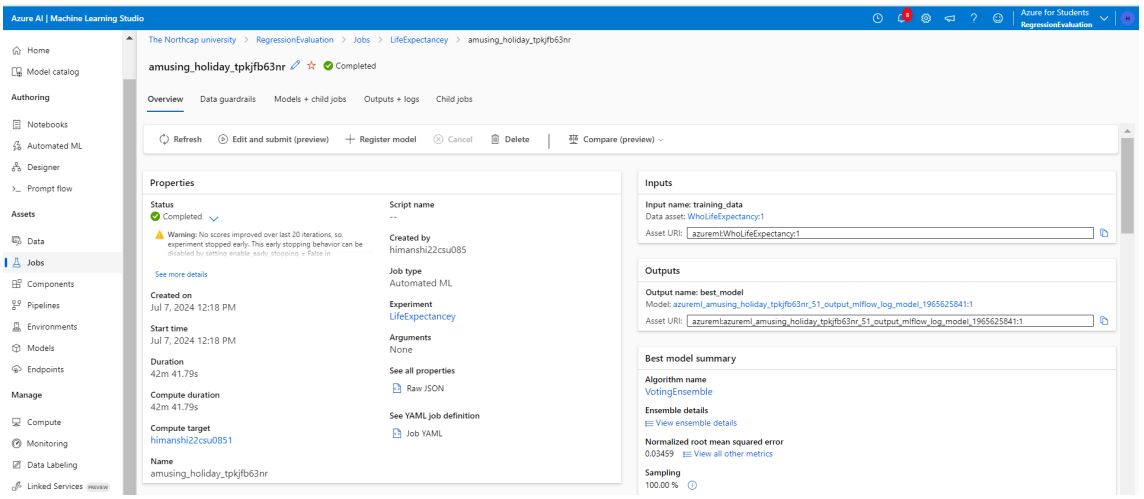
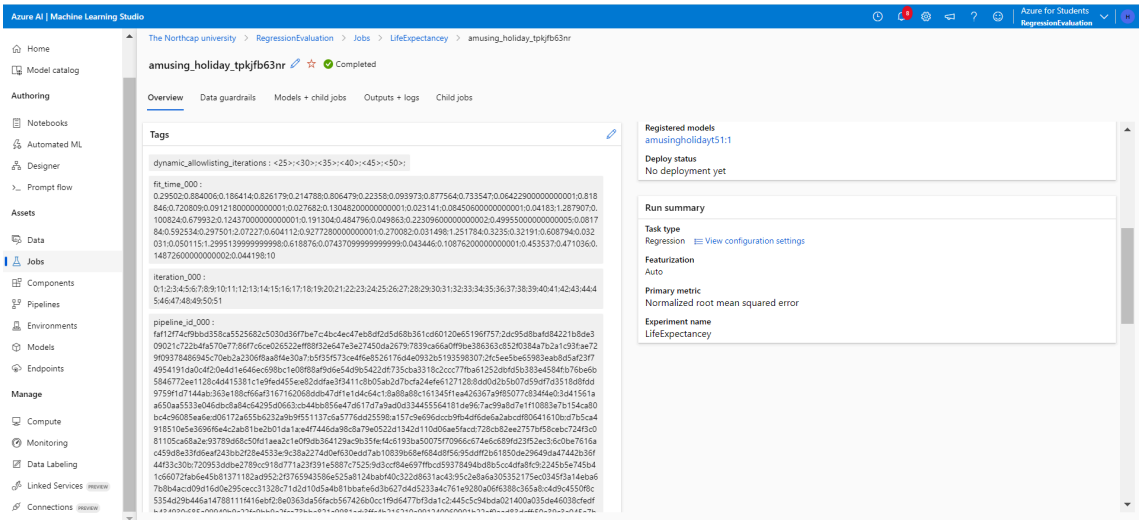
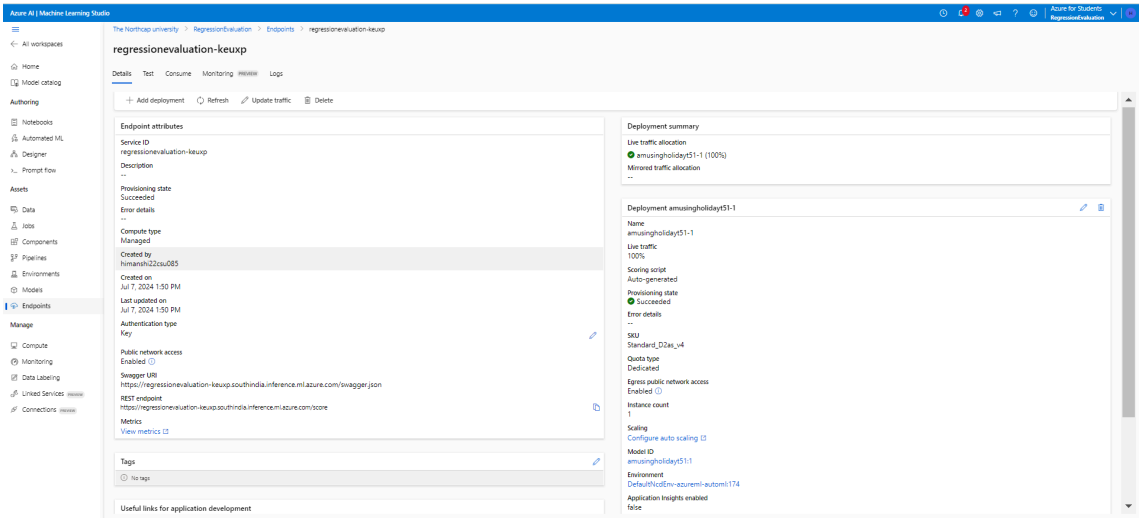
RegressionEvaluation
RegressionEvaluation > Jobs > LifeExpectancey > amusing_holiday_tpkjfb63nr > neat_spring_37dkjklm
neat_spring_37dkjklm
Completed
Overview
Model
Explanations (preview)
Responsible AI (preview)
Metrics
Data transformation (preview)
Test results (preview)
Outputs + logs
Images
Child jobs
Code
Monitoring
Refresh
Deploy
Download
Explain model
View generated code
Test model (preview)
Register model
Cancel
Delete
Model summary
Algorithm name
VotingEnsemble
Ensemble details
View ensemble details
Normalized root mean squared error
0.03459
View all other metrics
Sampling
100.00 %
Registered models
amusingholidayt51:1
Deploy status
No deployment yet


Azure AI | Machine Learning Studio
Azure for Students
RegressionEvaluation
The Northcap university > RegressionEvaluation > Jobs > LifeExpectancey > amusing_holiday_tpkjfb63nr
amusing_holiday_tpkjfb63nr
Completed
Overview
Data guardrails
Models + child jobs
Outputs + logs
Child jobs
Refresh
Edit and submit (preview)
Register model
Cancel
Delete
Compare (preview)
Properties
Status
Completed
Warning: No scores improved over last 20 iterations, so experiment stopped early. This early stopping behavior can be disabled by setting enable_early_stopping = False in
See more details
Created on
Jul 7, 2024 12:18 PM
Start time
Jul 7, 2024 12:18 PM
Duration
42m 41.79s
Compute duration
42m 41.79s
Compute target
himanshi22csu0851
Name
amusing_holiday_tpkjfb63nr
Script name
--
Created by
himanshi22csu085
Job type
Automated ML
Experiment
LifeExpectancey
Arguments
None
See all properties
Raw JSON
See YAML job definition
Job YAML
Inputs
Input name: training_data
Data asset: WhoLifeExpectancy:1
Asset URI: azureml:WhoLifeExpectancy:1
Outputs
Output name: best_model
Model: azureml_amusing_holiday_tpkjfb63nr_51_output_mlflow_log_model_1965625841:1
Asset URI: azureml:azureml_amusing_holiday_tpkjfb63nr_51_output_mlflow_log_model_1965625841:1
Best model summary
Algorithm name
VotingEnsemble
Ensemble details
View ensemble details
Normalized root mean squared error
0.03459
View all other metrics
Sampling
100.00 %


Azure AI | Machine Learning Studio
Azure for Students
RegressionEvaluation
Home
Model catalog
Authoring
Notebooks
Automated ML
Designer
Prompt flow
Assets
Data
Jobs
Components
Pipelines
Environments
Models
Endpoints
Manage
Compute
Monitoring
Data Labeling
Linked Services
Connections
The Northcap university > RegressionEvaluation > Jobs > LifeExpectancy > amusing_holiday_tpkjfb63nr
amusing_holiday_tpkjfb63nr
Completed
Overview
Data guardrails
Models + child jobs
Outputs + logs
Child jobs
Tags
dynamic_allowlisting_iterations : <25>;<30>;<35>;<40>;<45>;<50>;
fit_time_000 :
0.29502:0.884006:0.186414:0.826179:0.214788:0.806479:0.22358:0.093973:0.877564:0.733547:0.064229000000000 1:0.818846:0.720809:0.091218000000000 1:0.027682:0.130482000000000 1:0.023141:0.084506000000000 1:0.04183:1.287907:0.100824:0.679932:0.124370000000000 1:0.191304:0.484796:0.049863:0.223096000000000 2:0.499550000000000 5:0.081784:0.592534:0.297501:2.07227:0.604112:0.927728000000000 1:0.270082:0.031498:1.251784:0.3235:0.32191:0.608794:0.032031:0.050115:1.299513999999998:0.618876:0.074370999999999 9:0.043446:0.108762000000000 1:0.453537:0.471036:0.148726000000000 2:0.044198:10
iteration_000 :
0:1:2:3:4:5:6:7:8:9:10:11:12:13:14:15:16:17:18:19:20:21:22:23:24:25:26:27:28:29:30:31:32:33:34:35:36:37:38:39:40:41:42:43:44:45:46:47:48:49:50:51
pipeline_id_000 :
faf12f74cf9bbd358ca5525682c5030d36ff7be7c4bc4ec47eb8df2d5d68b361cd60120e65196f757:2dc95d8bafd84221b8de309021c722b4fa570e77:86f7c6ce026522eff88f32e647e3e27450da2679:7839ca66a0ff9be386363c852f0384a7b2a1c93fae729f093784865945c70eb2a2306f8aa8f4e30a7:b5f35f573ce4f6e8526176d4e0932b5193598307:2fc5ee5be65983eab8d5af23f74954191da0c4f20e4d1e646ec698bc1e08f88af9d6e54d9b5422df735cba3318c2ccc77fba61252dbfd5b383e4584fb76be6b584677 2ee1128c4d415381c1e9fed455ee82ddfae3f3411c8b05ab2d7bcfa24efe6127128:8dd0d2b5b07d59df7d3518d8fdd9759f1d7144ab:363e188cf66af3167162068ddb47df1e1d4c64c1:0a88a88c161345f1ea426367a9f85077c834f4e0:3d41561a650aa5533e046dbc8a84cf4295d0663:cb44bb856e47d617d7a9ad0d33445564181de9b7ac99a8d7e1f10883e7b154ca80bc4c96085ea6ed06172a655b6232a9b9f551137c6a5776dd3598a157c9e696dcdb9fb4df6de6a2abcdf80641610bcd7b5ca4918510e5e369f6e4c2ab81be2b01da1ae4f7446da98c8a79e0522d1342d110d06ae5facd728cb82ee2757bf58eabc724f3c081105ca68a2e:93789d68c50fd1aea2c1e0f9db364129ac9b35fef4c6193ba50075f70966c674e6c689fd23f52ec3c6cbe7616ac459d8e33fd6eaf243bb2f28e4533e9c38a2274d0ef630edd7ab10839b68ef684d8f56:95ddff2b61850de29649da47442b36f44f33c30b:720953ddbe2789cc918d771a23f391e5887c7525:9d3ccf84e697ffbcd59378494bd8b5cc4dfa8fc9:2245b5e745b41c66072fab6e45b81371182ad952:2f3765943586e525a8124babf40c322d8631ac43:95c2e8a6a305352175ec0345f3a14eba67b8b4acd09d16d0e295cecc31328c71d2d10d5a4b81bbafe6d3b627d4d5233a4c761e9280a06f6386c365a8:c4d9c4550f8c534d29b446a147881114f6ebf28e0363da56facb56742bb0cc1f9d6477bf3da1c2:445c5c94bda021400a035de46038cfedf
Registered models
amusingholidayt51:1
Deploy status
No deployment yet
Run summary
Task type
Regression
View configuration settings
Featurization
Auto
Primary metric
Normalized root mean squared error
Experiment name
LifeExpectancy

# EXPERIMENTAL RESULTS (IF ANY)

DEPLOYMENT OF LIFE EXPECTANCY MODEL

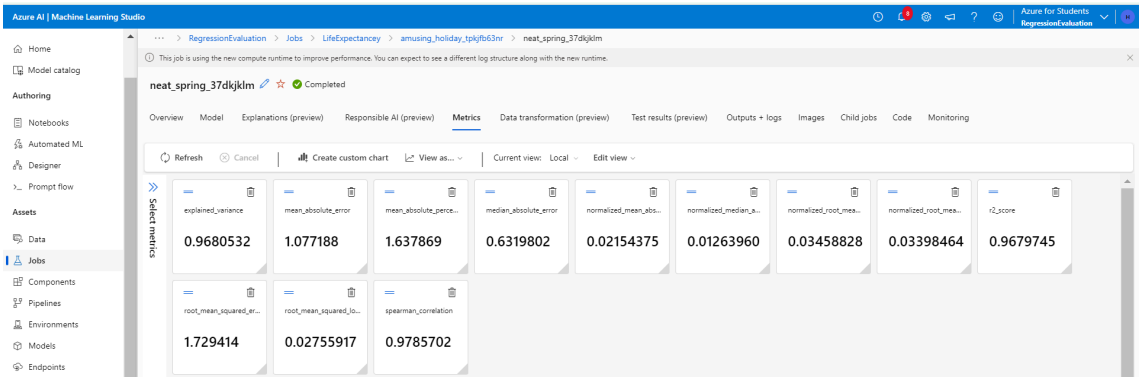



**TESTING OF MODEL WITH RANDOM VALUES**

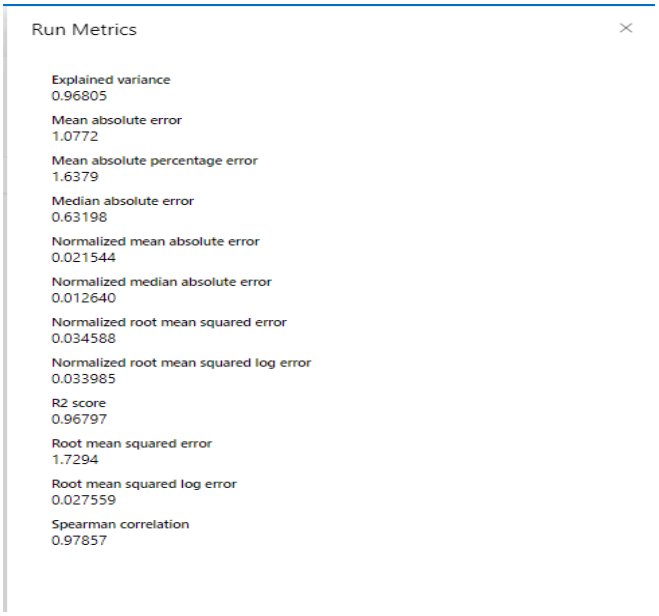
```
import requests
import json
url = "https://regressionevaluation-keuxp.southindia.inference.ml.azure.com/score"

headers = {
    'Content-Type': 'application/json',
    'Authorization': 'Bearer XtoNb9IGkDJefGL56k5G7f6caWsfCfmq'
}

data = {
  "input_data": {
      "data": [
          {
      "Country": "Albania",
      "Year": 2015,
      "Status": "Developing",
      "AdultMortality": 263,
      "infantdeaths": 62,
      "Alcohol": 62,
      "percentageexpenditure": 71.27962,
      "HepatitisB": 65,
      "Measles": 1154,
      "BMI": 19.1,
      "under-fivedeaths": 83,
      "Polio": 6,
      "Totalexpenditure": 8.16,
      "Diphtheria": 65,
      "HIV/AIDS": 0.1,
      "GDP": 584.2592,
      "Population": 33736494,
      "thinness1-19years": 17.2,
      "thinness5-9years": 17.3,
      "Incomecompositionofresources": 0.479,
      "Schooling": 10.1
  }
      ]
    }
}
input_data = json.dumps(data)

response = requests.post(url, data=input_data, headers=headers)

print(response.json())
```

✓ 0.1s

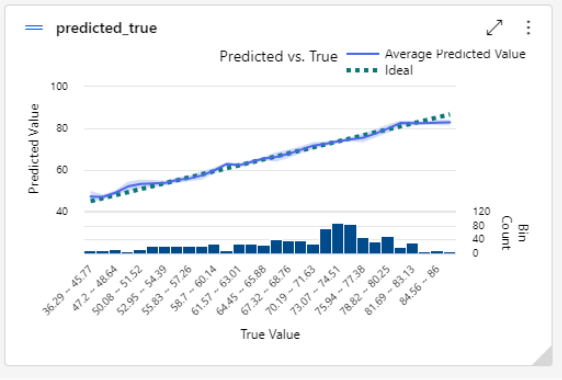
```
[64.48174877450128]
```



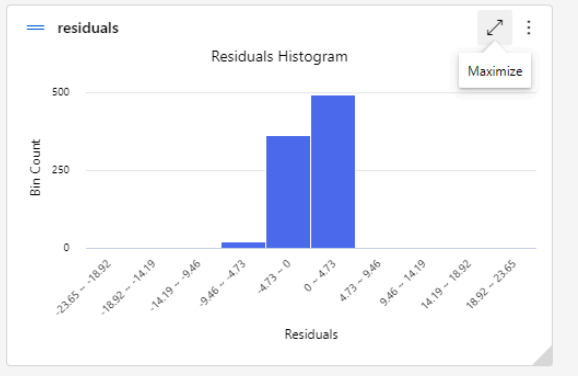

IMPLEMENTATION OF VARIOUS MODEL EVALUATION METRIC FOR LIFE EXPECTANCY PREDICTION




RUN METRICS




**Results:-** Show that how many values we predicted and out of which we get how many actually true.




Histogram graph

# ANALYSIS

During my internship with UTS (Unique Training Solution) at The Northcap University, Gurugram, I had the opportunity to deepen my understanding of the engineering profession, particularly in the fields of Artificial Intelligence (AI) and Machine Learning (ML). This hands-on experience was crucial in bridging the gap between theory and practice, allowing me to develop both technical and non-technical skills essential for a successful engineering career.

Key Learning Outcomes:

Technical Proficiency:

- AI/ML Skills: Gained a solid foundation in AI and ML, learning to develop and deploy machine learning models, work with algorithms, and manage large datasets. This experience has equipped me to leverage AI/ML in solving complex engineering challenges.
- Cloud Computing with Azure: Acquired practical experience with Microsoft Azure services, focusing on deploying AI/ML projects in a cloud environment. This has enhanced my understanding of how cloud platforms support scalable and efficient engineering solutions.

Professional Growth:

- Team Collaboration: Developed strong teamwork skills, contributing effectively to group projects and often taking on leadership roles. This experience reinforced the importance of collaboration in achieving project goals.

- Client Interaction: Learned the importance of translating technical concepts into understandable terms for clients and delivering solutions that align with their needs. This customer-centric approach is crucial in the engineering field.

Company Insights:

- Organizational Structure: Gained valuable insights into how UTS operates, emphasizing structured training, effective communication, and continuous learning. Observing these initiatives reinforced the importance of staying current with industry trends.

Performance Highlights:

Strengths:

- Adaptability: Demonstrated a strong ability to quickly learn and apply new concepts, particularly in AI/ML and Azure services. Successfully developed and deployed a basic ML model on Azure, showcasing my ability to turn knowledge into practical outcomes.
- Leadership and Collaboration: Excelled in teamwork, often leading project tasks and ensuring successful outcomes. My ability to collaborate and communicate effectively was a key contributor to project success.

Areas for Improvement:

- Time Management: While I managed to meet deadlines, I recognized the need to improve my time management skills, particularly when balancing multiple tasks.

Moving forward, I plan to prioritize tasks more effectively and use project management tools to optimize my workflow.

- Advanced Technical Skills: While I built a strong foundation in AI/ML, I aim to deepen my expertise in more advanced machine learning algorithms. I plan to dedicate more time to studying these topics and seek out challenging projects to further my skills.

Supervisor Feedback:

My supervisor provided positive feedback on my quick learning abilities and effective teamwork, noting that I consistently met project expectations and often took initiative in group settings. They also encouraged me to continue developing my time management skills and to explore more advanced technical areas to further enhance my expertise.

This internship has been an invaluable experience, providing me with the technical knowledge and professional skills necessary for a successful engineering career. I am excited to continue building on this foundation and contributing to the field.

# CONCLUSION

Summary of Summer Training Experience

My summer training with UTS at The Northcap University was pivotal in advancing my understanding of the engineering profession, both technically and organizationally.

Technical and Organizational Learning:

Technical Advancement:

- AI/ML Proficiency: The training solidified my understanding of Artificial Intelligence and Machine Learning, allowing me to work on real-world projects and develop practical skills in deploying AI/ML models using Microsoft Azure.
- Cloud Computing: I gained hands-on experience with Azure, which enhanced my knowledge of cloud computing and its critical role in modern engineering solutions.

Organizational Insights:

- Team Dynamics: I learned the importance of teamwork and collaboration in a professional setting, observing how different roles and expertise come together to achieve common goals.
- Project Management: The training also provided insights into effective project management, including task prioritization, time management, and the importance of clear communication within a team.

Benefits and Knowledge Enrichment:

- Practical Application: The opportunity to apply theoretical knowledge to practical projects was one of the most significant benefits of this training. It reinforced the importance of hands-on experience in understanding complex engineering concepts.
- Professional Growth: The training enriched my knowledge of how engineering principles are applied in the industry, preparing me for future professional challenges. It also improved my soft skills, such as communication and leadership, which are essential in any engineering role.

Areas for Improvement and Suggestions:

- Educational Gaps: While the training was comprehensive, I realized that my education could be supplemented with more advanced coursework in AI/ML algorithms and cloud computing to better prepare for future projects.
- Program Suggestions: To enhance the training program, I would suggest incorporating more advanced topics and offering additional resources or mentorship for students interested in deepening their technical expertise. This would help bridge any educational gaps and ensure a more robust learning experience.

Overall, this summer training was highly beneficial, providing a strong foundation for my engineering career and highlighting areas for further development.

# BIBLIOGRAPHY

Dataset link:-

https://www.kaggle.com/datasets/kumarajarshi/life-expectancy-who

Books:

[1] J. Han, M. Kamber, and J. Pei, Data Mining: Concepts and Techniques, 3rd ed. San Francisco: Morgan Kaufmann, 2011.

[2] P.-N. Tan, M. Steinbach, and V. Kumar, Introduction to Data Mining, 2nd ed. Boston: Pearson, 2013.

[3] I. H. Witten, E. Frank, and M. A. Hall, Data Mining: Practical Machine Learning Tools and Techniques, 4th ed. San Francisco: Morgan Kaufmann, 2016.

Websites:

[4] Various Contributors, "Kaggle," Kaggle. [Online]. Available: https://www.kaggle.com. [Accessed: Jul. 2024].

[5] Various Contributors, "GeeksforGeeks Data Science," GeeksforGeeks. [Online]. Available: https://www.geeksforgeeks.org/data-science/. [Accessed: Jul. 2024].

[6] Various Contributors, "Towards Data Science," Medium. [Online]. Available: https://towardsdatascience.com. [Accessed: Jul. 2024].

[7] Various Contributors, "DataCamp," DataCamp. [Online]. Available: https://www.datacamp.com. [Accessed: Jul. 2024].

[8] Various Contributors, "Data Science Central," Data Science Central. [Online]. Available: https://www.datasciencecentral.com. [Accessed: Jun. 2024].

[9] Various Contributors, "UCI Machine Learning Repository," UCI Machine Learning Repository. [Online]. Available: https://archive.ics.uci.edu/ml/index.php. [Accessed: Jun. 2024].

PowerPoint Presentations:

[10] UTI Trainers and Teachers, [MICROSFT AZURE AI-900], [THE NORTHCAP UNIVERSITY], [1ST JUNE 2024].

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# APPENDIX

List all supporting material such as: a brief introduction to the hosting firm, its management and administrative structure; sample plans or drawings; technical documents and literature; design and calculation sheets; and other relevant material, daily project task.

**Voting Ensemble Algorithm**

Concept: A voting ensemble algorithm aggregates predictions from multiple models (often referred to as base learners or classifiers) to make a final prediction. The idea is that combining different models can lead to more accurate and robust predictions than any single model.

Types of Voting:

1. Majority Voting (Hard Voting):
    - Classification: Each base model votes for a class, and the class with the majority of votes is chosen as the final prediction.
    - Regression: The final prediction is usually the average of predictions from all base models.

**Predictions vs. True Values**

**Purpose:**

- To visually assess how close the predicted values are to the actual values.

## Residual Plot:-

**Purpose:**

- To visualize the difference between predicted values and true values (residuals).

**Description:**

- Plots residuals (errors) on the y-axis against predicted values or true values on the x-axis.

# PROJECT DAILY TASKS

| | |
|---|---|
| 1 June 2024 | Introduction to AI and Machine Learning |
| 3 June 2024 | Introduction to AI workloads and Principles of AI |
| 4 june 2024 | Azure Machine learning services and Types of ML models |
| 5 june 2024 | Core Machine Learning Concepts And Evaluation metric for regression and classification.<br>ML Solution Core Tasks(Data Pre Processing) |
| 6 june 2024 | Azure Machine Learning Workspace(No code policy)#Designer<br>Hands-on-lab (Regression and Classification) |
| 7th june 2024 | Various types of Comupter Vision Services<br>and Various Types of NLP services |
| 8th june 2024 | Conversational AI |
| 9 to 14 june 2024 | Preparation Holiday for Microsoft Azure AI-900 Certification |
| 15 june 2024 | Exam Day |
| 17 june 2024 | Starting working on Project |
| 18 june 2024 | Setting up azure resources(VMs,Storage,Databases) and initial environment. |
| 19 june 2024 | Data collection and exploration for suitable dataset for our project |
| 20 june 2024 | Preprocessing data: Data Ingestion, Data Transformation and Data cleaning |
| 21 june 2024 | Feature Enggineering: Selecting Suitable features for model to gain insights from it. |

| | |
|---|---|
| 22 june 2024 | Initial Model selection: Experimenting with Linear Regression and Using VotingEnsemble Algorithm |
| 23 june 2024 | Training and testing models with subsets of the data: evaluating initials |
| 24 june 2024 | Model Tuning and: optimizing hyperparameters for linear regression and votingEnsemble |
| 25 june 2024 | Implementing a model Evaluation metric and testing on prepared datasets. |
| 27 june 2024 | Comparing performances between models. |
| 28 june 2024 | Selecting Best working Models, Model validation:Performing cross validation. |

| | |
|---|---|
| 29 june 2024 | Deploying the best performing Model on Azure: Setting up endpoints for real time Life expectancy. |
| 30 june 2024 | Analyzing our ML model |
| 1 july 2024 | Final Performance evaluation,Preparing the Project for Submission and Creating Reports. |
| 2 july 2024 | Project Presentation and Project Hand-off and conclusion. |