

Semester	T.E. Semester VI – Computer Engineering
Subject	Cloud Computing
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**Title: Machine Learning as a Service**

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**Implementation:**

## 1) AWS SageMaker

The screenshot displays the AWS SageMaker console interface. The top navigation bar includes the AWS logo, 'Services', a search bar, and user information (Sydney, deepsalunkhee). The left sidebar shows the 'Amazon SageMaker' menu with options like 'Getting started', 'Studio', 'Studio Lab', 'Canvas', 'RStudio', 'Admin configurations', and 'JumpStart'. The main content area is titled 'MACHINE LEARNING' and 'Amazon SageMaker', with the subtitle 'Build, train, and deploy machine learning models at scale'. It includes a 'New to SageMaker?' section with 'Set up for single user' and 'Set up for organizations' buttons, and a 'Documentation' link. Below this, a blue banner announces 'Sagemaker geospatial capability is now generally available in us-west-2'. A subsequent blue banner states 'Preparing SageMaker Domain. Please do not close this browser tab.' The main content area shows the 'Domain details' for 'QuickSetupDomain-20240403T092838', with tabs for 'User profiles', 'Space management', 'Environment', and 'Domain settings'. The 'User profiles' tab is active, showing a search bar and a table with columns 'Name', 'Modified on', and 'Created on'.

The image displays two screenshots of the Amazon SageMaker console interface. The top screenshot shows the 'Domain details' page for 'QuickSetupDomain-20240403T092838'. The left sidebar lists navigation options like 'Getting started', 'Studio', 'Canvas', 'RStudio', 'TensorBoard', 'Profiler', and 'Admin configurations'. The main content area shows 'Domain details' with tabs for 'User profiles', 'Space management', 'Environment', and 'Domain settings'. Under 'User profiles', there is a search bar and a table with one user profile: 'default-20240403t092838', created on 'Apr 03, 2024 04:04 UTC'. The bottom screenshot shows the 'User Details' page for the same user profile. It includes a table for 'Apps' (currently empty) and a 'Details' section showing the user's name, execution role (arn:aws:iam::590183870192:role/service-role/AmazonSageMaker-ExecutionRole-20240403T092839), and creation time (Wed Apr 03 2024 09:34:12 GMT+0530).

The screenshot displays the Amazon SageMaker console interface. The top navigation bar includes the AWS logo, 'Services', a search bar, and user information for 'N. Virginia' and 'deepsalunkhee'. The left sidebar shows the 'Amazon SageMaker' menu with options like 'Getting started', 'Studio', 'Studio Lab', 'Canvas', 'RStudio', 'TensorBoard', 'Profiler', 'Admin configurations', and 'SageMaker dashboard'. The main content area is divided into two sections: 'General settings' and 'Storage configurations'. The 'General settings' section shows details for a SageMaker domain, including its name, status (Ready), domain ID, creation and modification timestamps, authentication method (IAM), and execution role. The 'Storage configurations' section shows the encryption key. Below this, the 'Apps' section is visible, featuring tabs for 'Studio', 'Studio Lab', 'Canvas', and 'RStudio'. The 'Studio Lab' tab is selected, showing a description of the free ML development environment and a 'Launch App' button. At the bottom, there is a 'Revert to Studio Classic experience' section with a corresponding button.

**General settings** [info](#) [Edit](#)

<b>Name</b> QuickSetupDomain-20240403T092838	<b>Status</b> ✔ Ready	<b>Domain ID</b> d-wtlof9ju6att
<b>Created</b> Wed Apr 03 2024 09:28:17 GMT+0530 (India Standard Time)	<b>Last modified</b> Wed Apr 03 2024 09:33:59 GMT+0530 (India Standard Time)	<b>VPC</b> vpc-038f95f06ea7dacee
<b>Authentication method</b> AWS Identity and Access Management (IAM)	<b>Execution role</b> arn:aws:iam::590183870192:role/service-role/AmazonSageMaker-ExecutionRole-20240403T092839	

**Storage configurations** [Edit](#)

Encryption key

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**Apps**  
Configure apps to manage your ML workflow using SageMaker.

Studio | **Studio Lab** | Canvas | RStudio

**Studio Lab**

Amazon SageMaker Studio Lab is a free ML development environment that provides the compute, storage (up to 15GB), and security—all at no cost—for anyone to learn and experiment with ML. All you need to get started is a valid email address. You don't need to configure infrastructure or manage identity and access.

[Launch App](#) [Learn more](#)

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**Revert to Studio Classic experience** [info](#) [Revert to Studio Classic process](#)

https://studiolab.sagemaker.aws © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

The screenshot displays the AWS Marketplace interface. At the top, there's a navigation bar with the AWS logo, a search bar, and user information (N. Virginia, deepsalunkhee). Below this, a sidebar on the left lists various AWS services and categories. The main content area features a 'Featured algorithms' section with three cards: AutoGluon-Tabular, Cognitive QnA, and Facial Recognition Algorithm for Images. The Cognitive QnA card is highlighted, showing its details and a 'View product' button. Below this, the 'aws marketplace' header is visible, followed by a search bar and navigation links. The main product page for Cognitive QnA is shown, including a 'Continue to Subscribe' button, a 'Save To List' button, and a 'Product Overview' section. The 'Product Overview' section describes the service and its capabilities. A 'Key Data' table is also present, listing the version (v1.0.0beta) and the provider (Active.ai). A 'Highlights' section on the right lists the key features of the service.

**Featured algorithms** [See all products](#)

**AutoGluon-Tabular**  
By Amazon Web Services | Ver 4.1  
An AutoML algorithm that trains a multi-layer stack ensemble model to predict on regression/classification datasets directly from CSV data.

[View product](#)

**Cognitive QnA**  
By Active.ai | Ver v1.0.0beta  
**Free Trial**  
provides an FAQ data source that you can query from your bot or application

[View product](#)

**Facial Recognition Algorithm for Images**  
By Sensifai | Ver v1  
**Free Trial**  
Face Recognition/Identification in Images

[View product](#)

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**aws marketplace** [Search](#) Hello, deepsalunkhee

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**Cognitive QnA** Free trial

By: [Active.ai](#) Latest Version: v1.0.0beta  
provides an FAQ data source that you can query from your bot or application

[Continue to Subscribe](#) [Save To List](#)

[Overview](#) [Pricing](#) [Usage](#) [Support](#) [Reviews](#)

## Product Overview

Cognitive QnA is an intelligent service , which given a set of FAQ's as an input , is able to intelligently answer a wide range of related questions. It does not require any annotation or tagging of input data and needs minimal variants of the input questions, additionally it is able to create varaints using its powerful paraphrasing capability. Cognitive QnA works best for financial services industry , but can works across all other domains as well with relevant data augmentation.

Key Data	
Version	v1.0.0beta <a href="#">Usage Instructions</a> <a href="#">Release Notes</a>
By	<a href="#">Active.ai</a>

### Highlights

- creating bot from FAQ data source and generating paraphrases with considerable accuracy.
- provides an FAQ data source that you can query from your bot or application
- build, train and publish a simple question and answer bot based on FAQ.

**Amazon SageMaker > Notebook instances**

Search notebook instances

Name	Instance	Creation time	Status	Actions
There are currently no resources.				

**Amazon SageMaker > Domains > Domain: QuickSetupDomain-20240403T092838**

**QuickSetupDomain-20240403T092838**

Domain details

Configure and manage the domain.

User profiles | Space management | Environment | Domain settings

**User profiles Info**

A user profile represents a single user within a domain. It is the main way to reference a user for the purposes of sharing, reporting, and other domain-related tasks.

Search users

Name	Modified on	Created on
default-20240403t092838	Apr 03, 2024 04:04 UTC	Apr 03, 2024 04:04 UTC

**Personal apps**

- Studio
- Canvas
- TensorBoard
- Profiler

**Collaborative**

- Spaces

Launch

https://us-east-1.console.aws.amazon.com/sagemaker/home?region=us-east-1#/studio/open/d-wtlof9ju6att/default-20240403t092838

The image shows a JupyterLab interface. The top bar displays the URL `trial-rv59.notebook.us-east-1.sagemaker.aws/tree` and the Jupyter logo. Below the top bar, there are tabs for `Files`, `Running`, `Clusters`, `SageMaker Examples`, and `Conda`. The `Files` tab is active, showing a file browser with a search bar and a table of files. The table is empty, with the message "The notebook list is empty." below it. The bottom part of the image shows a code editor with a menu bar (File, Edit, View, Insert, Cell, Kernel, Widgets, Help) and a toolbar. The code editor contains two input cells. The first cell has the text `In [2]: print("Here we can tCreate and train the model")` and the output `Here we can tCreate and train the model`. The second cell is empty, with the text `In [ ]:` at the start.

## 2) Azure ML

The first screenshot shows the 'Azure Machine Learning' workspace creation page. It includes tabs for Basics, Networking, Encryption, Identity, Tags, and Review + create. Under 'Resource details', the Subscription is 'Azure for Students' and the Resource group is '(New) MLtesting'. Under 'Workspace details', the Name is 'testml', the Region is 'Central India', and the Storage account is '(new) testml5859531631'.

The second screenshot shows the 'Review + create' step. A green banner indicates 'Validation passed'. The Basics section lists the configuration: Subscription (Azure for Students), Resource group ((New) MLtesting), Region (Central India), Name (testml), Storage account ((new) testml5859531631), Key vault ((new) testml8499063566), Application insights ((new) testml0734747866), and Container registry ((new) mlcontainer003). The Networking section shows 'Connectivity method' set to 'Enable public access from all networks'.

The third screenshot shows the 'testml' workspace overview. The left sidebar contains links for Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Events, Settings, Networking, Properties, and Locks. The main area displays 'Essentials' with a table of workspace details:

Property	Value
Resource group	MLtesting
Location	Central India
Subscription	Azure for Students
Storage	testml5859531631
Studio web URL	https://ml.azure.com/?tid=c7b00d7f-ad99-442a-b12f-c2c...
Container Registry	mlcontainer003
Key Vault	testml8499063566
Application Insights	testml0734747866
MLflow tracking URI	azureml://centralindia.api.azureml.ms/mlflow/v1.0/subsc...



The screenshot displays the Azure AI Machine Learning Studio interface. The top navigation bar shows 'Azure AI | Machine Learning Studio' and 'Azure for Students testml'. The left sidebar contains a menu with options like 'All workspaces', 'Home', 'Model catalog', 'Authoring', 'Assets', and 'Environments'. The main content area is titled 'testml' and features a 'Generative AI with Prompt flow' section. This section includes four templates: 'Multi-Round Q&A on Your Data', 'Q&A on Your Data', 'Web Classification', and 'Chat with Wikipedia'. Each template has a 'Start' and 'Clone' button. Below this is a 'Generative AI models' section with four Mistral AI models: 'mistralai-Mixtral-8x7B-v01', 'mistralai-Mistral-7B-v01', 'mistralai-Mixtral-8x7B-Ins...', and 'mistralai-Mistral-7B-Ins...'. The bottom part of the image shows a detailed view of the 'Chat with Wikipedia' template. It includes a description, a 'What you will learn' section, and a code block for the prompt template.

**Chat with Wikipedia**

This is a companion sample flow to "Ask Wikipedia". It demonstrates how to create a chatbot that can remember previous interactions and use the conversation history to generate next message.

**What you will learn**

In this flow, you will learn

- how to compose a chat flow.
- prompt template format of LLM tool chat API. Message delimiter is a separate line containing role name and colon: "# system:", "# user:", "# assistant:". See [OpenAI Chat](#) for more about message role.
- how to consume chat history in prompt.

```
# system:
You are a chatbot having a conversation with a human.

# user:
{{question}}

{% for item in chat_history %}
# user:s
{{item.inputs.question}}
```

Buttons: Go Back, Clone, Cancel

The image displays two screenshots of the Azure AI Machine Learning Studio interface, showing a chatbot workflow and its execution.

**Top Screenshot: Workflow Design**

The interface shows a workflow titled "Chat with Wikipedia-04-02-2024-21-54-19". The workflow is designed in the "Flow" view, which includes a "Raw file mode" toggle. The workflow is composed of the following steps:

- Inputs:** A table with columns "Name", "Type", "Value", "Chat input", "Tag", and "Action". It contains two inputs: "chat\_histo" (list) and "question" (string). The "question" input has a value of "What is the difference b...".
- Outputs:** A table with columns "Name", "Value", "Chat output", and "Action". It contains one output: "answer" with a value of "\${augmented\_chat.output}".
- Graph:** A visual representation of the workflow showing three steps: "extract\_query\_from\_quest...", "get\_wiki\_url", and "search\_result\_from\_url".

**Bottom Screenshot: Chat Interface**

The interface shows the chatbot in action. The "Chat" view displays a conversation with the chatbot. The user input is "What is ChatGPT?". The chatbot response is:

ChatGPT is a chatbot product developed by OpenAI. It is powered by the Generative Pre-trained Transformer (GPT) series of language models, with GPT-4 being the latest version. ChatGPT uses natural language