National College of Ireland

Cloud based Smart Waste Management System Using Internet of Things (IoT) and Predictive Analysis Configuration Manual

MSc Research Project
Cloud Computing

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Project Submission Sheet
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Cloud based Smart Waste Management System Using Internet of Things (IoT) and Predictive Analysis Configuration Manual

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1 Introduction

This configuration manual is for my research project "Cloud based Smart Waste Management System Using Internet of Things (IoT) and Predictive Analysis." To run the code in this, follow the step-by-step instructions I've provided. I've also mentioned the setup and configuration of the AWS SageMaker.

2 Prerequisite

This research work is implemented on the AWS SageMaker. An AWS account will be required.

3 Dataset

The sensor data is came from the COMPOSITION EU Project.The deployed data sets include the sensor readings from the deployed bin fill level bins.[1]These data sets are accessible to everyone. The declaration of public access and usage of the data has made it available online. In the first data set, indoor bin fill levels are being monitored. The second data set deals with an outside-monitored bin's fill level. We used the second data set for our research.

4 AWS Setup

Login into AWS and navigate to AWS SageMaker Studio as shown in Figure 1. and Figure 2

5 Notebook Setting up

Go to File then New then Notebook for setting up Jupyter Notebook as shown in figure 3.

[1] https://zenodo.org/record/3375560

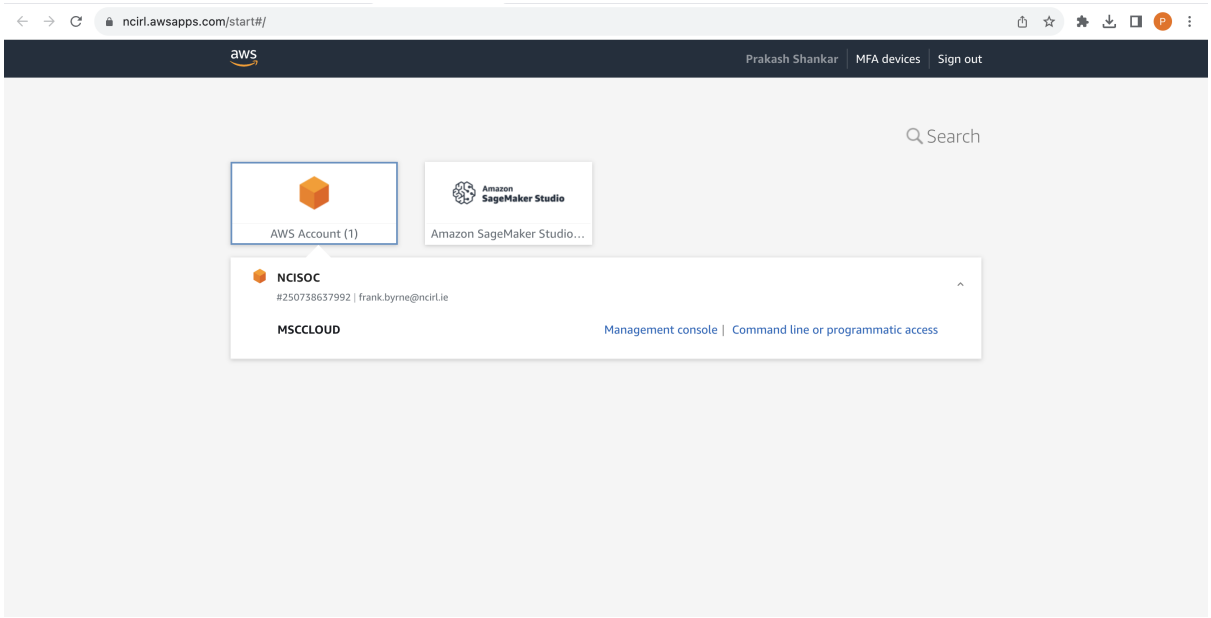

Figure 1: AWS Home

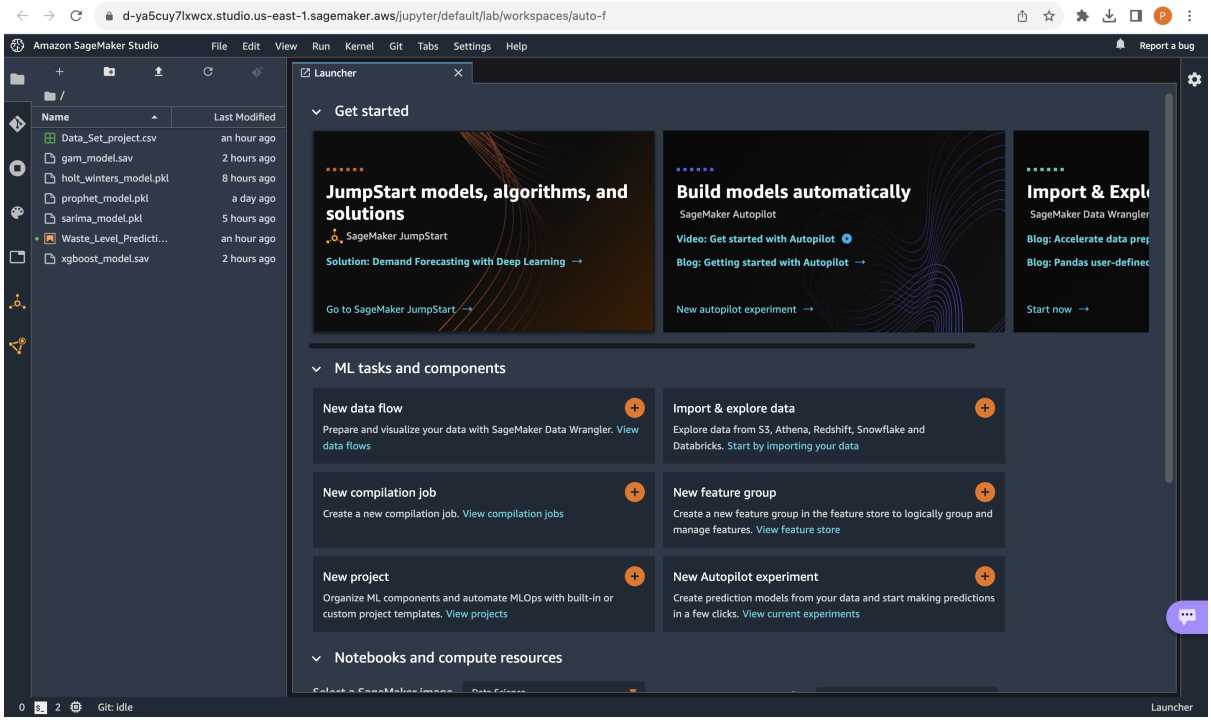

Figure 2: Amazon SageMaker Studio

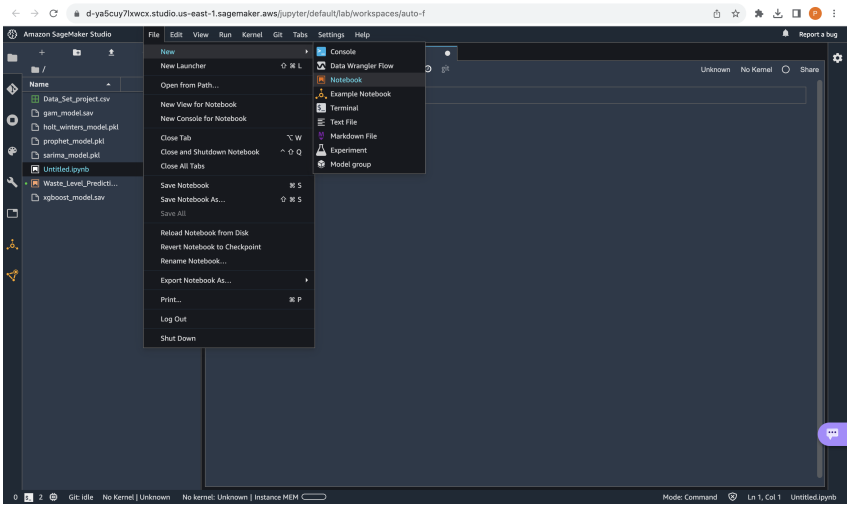

Figure 3: Creating Jupyter Notebook

5.1 Setting up Notebook Environment

Select the image as PyTorch 1.10 Python 3.8 CPU Optimised image, which is included

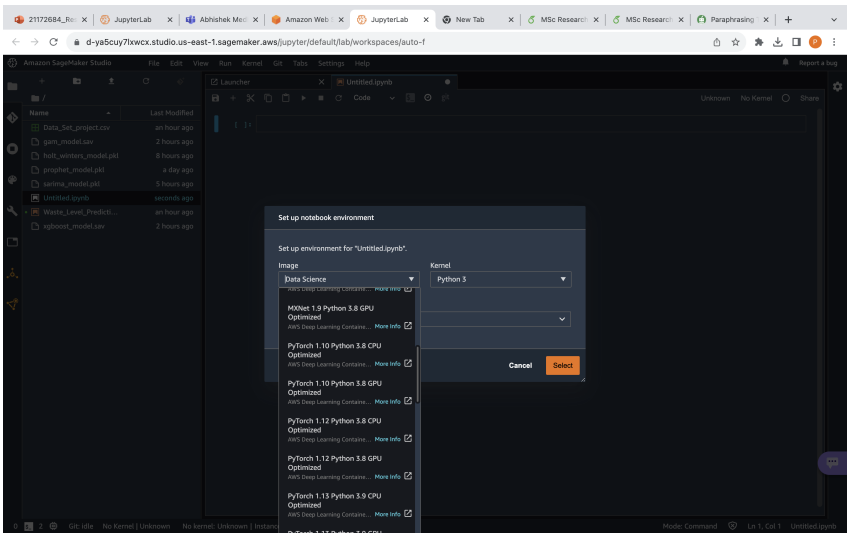

Figure 4: Jupyter Notebook Environment

in deep learning container. The Kernel will be python 3 by default.

5.2 Setting up Notebook Instance

Click on the 2vCPU option as shown in the figure 5 and the pop up will displayed.

Deselect the fast app only option and the instances list will open, select the 48 vCPU + 96 GIB and ml.c5.12xlarge instance type as shown in the figure 6.

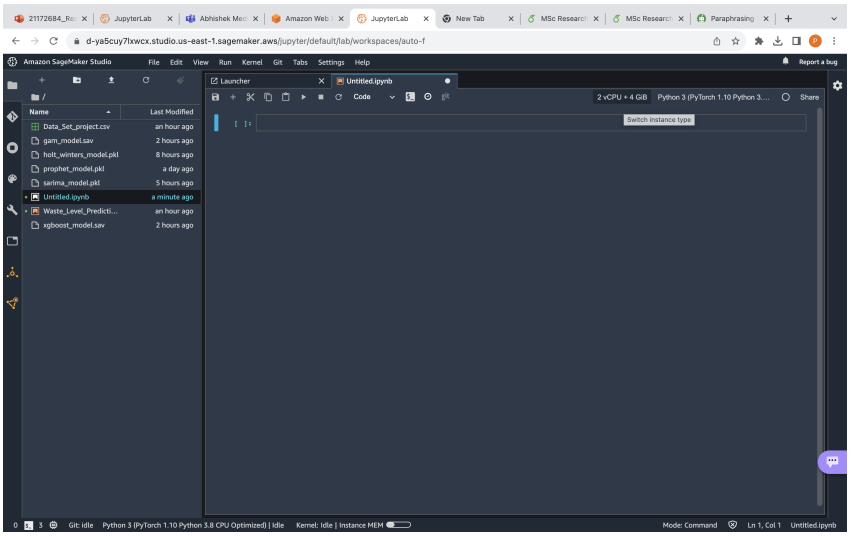

Figure 5: Jupyter Notebook Instance

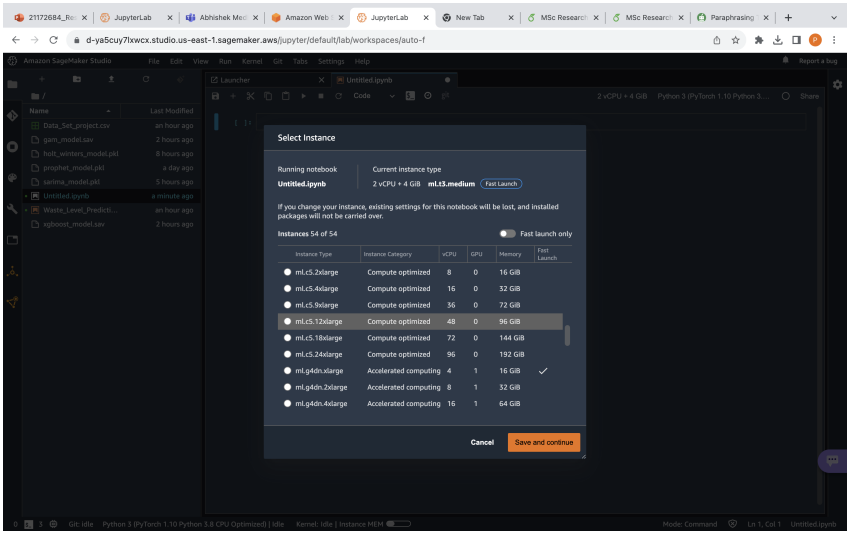

Figure 6: Jupyter Notebook Instance Selection

6 Import the artifacts

Import the data set and the Waste_Level_Prediction.ipynb files in the Jupyter notebook.

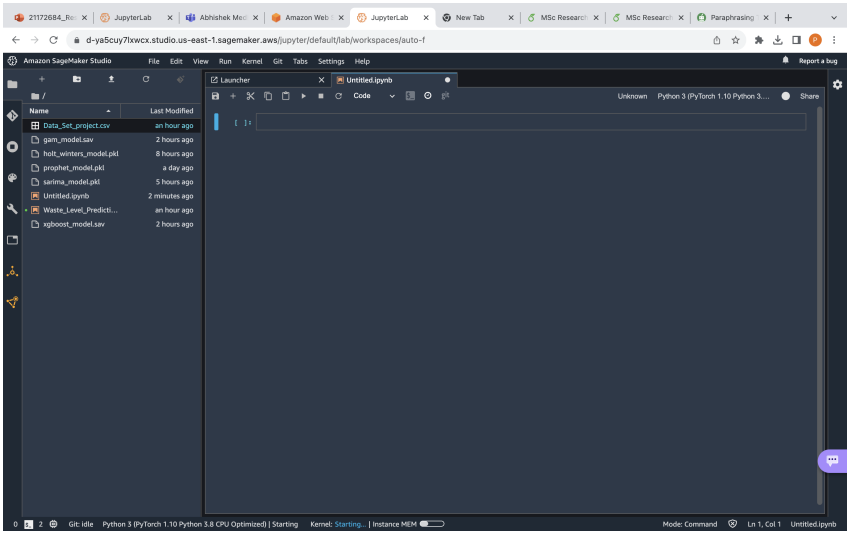

Figure 7: Importing artifacts in Jupyter Notebook

7 Implementation

Run all remaining cells one by one in the Jupyter notebook.

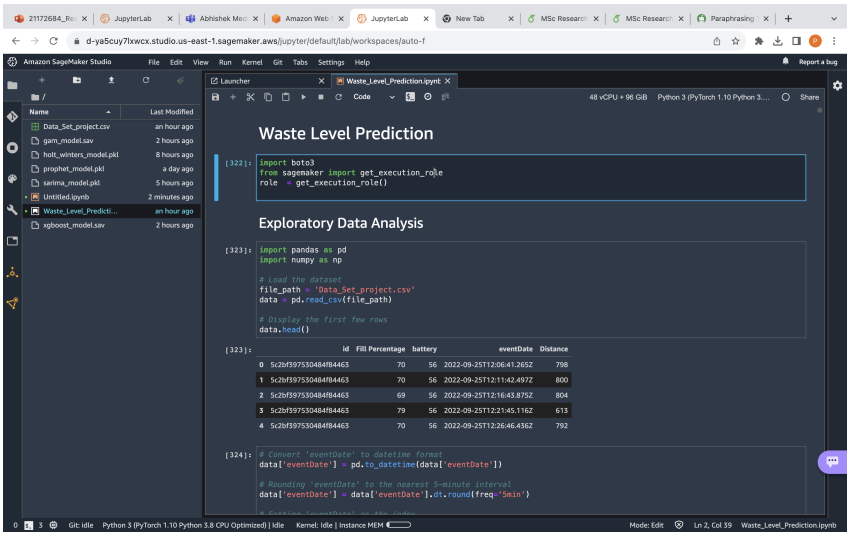

Figure 8: Implementation