5 Beginner-Friendly Amazon SageMaker Projects — Step-by-step Illustrated Guide (with SageMaker Studio Setup)

This updated version includes a **detailed setup guide for Amazon SageMaker Studio** so that beginners can launch the environment before starting any project.

🧰 Section 0 — Setting Up Amazon SageMaker Studio (One-Time Setup)

Before starting any project, set up SageMaker Studio. Follow these steps carefully — no coding required.

Step 1: Sign in to AWS Console

- Go to https://aws.amazon.com/console.
- Log in with your AWS account (or create one if new).
- Ensure you are using a region where SageMaker is available (e.g., **us-east-1** or **us-west-2**).

Step 2: Open SageMaker Service

- In the AWS Console search bar, type **"SageMaker"**.
- Select **Amazon SageMaker** from the list.

Step 3: Launch SageMaker Studio

- In the left panel, click **SageMaker Studio** → **Launch app** → **Studio**.
- If you're prompted to create a domain, click **Set up SageMaker domain**.

Step 4: Create a SageMaker Domain (first time only)

- Choose **Standard setup** → **Quick setup**.
- When asked for an execution role:
    - Choose **Create a new role**.
    - In the pop-up, select **Any S3 bucket** access (for now, or restrict later).
    - Click **Create role**.
- Accept defaults for storage and network configuration.
- Click **Submit** and wait for provisioning (takes ~5–10 minutes).

Step 5: Launch Studio Interface

- Once the domain is created, click **Launch app** → **Studio**.
- SageMaker Studio opens in a new browser tab.

- You'll see a navigation bar on the left with icons for **Files**, **JumpStart**, **Data**, **Training**, and **Inference**.

Step 6: Verify Environment

- Confirm that the **JumpStart** tab appears. If not, ensure you are in a supported region.
- Optionally, check the top-right corner for your instance type — you can select **ml.t3.medium** (Free Tier eligible).

Step 7: Create an S3 Bucket (for data)

- Go to **AWS Console → S3 → Create bucket**.
- Name it `sagemaker-practice-yourname`.
- Keep defaults and click **Create bucket**.

✅ Prerequisites Summary

- AWS Account & Billing Alerts set.
- SageMaker Domain created.
- SageMaker Studio launched.
- One S3 bucket created for project files.

You're now ready to start the projects below.

Project 1 — Sentiment Analysis of Product Reviews

Goal: Predict if a product review is positive or negative.

Steps

1. Open **SageMaker Studio** → go to the **JumpStart** tab.
2. Search for **Text Classification (Sentiment Analysis)** model.
3. Click **Deploy** → choose `ml.t3.medium` instance → name endpoint.
4. Once deployed, test sentences in the built-in test panel.

Example Input

- "This product is amazing!"
- "I regret buying this item."

Output

- Positive / Negative with confidence score.

Concept Learned

Natural Language Processing (NLP), model deployment, real-time inference.

Project 2 — Image Classification (Cats vs Dogs)

Goal: Classify uploaded cat/dog images.

Steps

5. Go to **JumpStart → Image Classification**.
6. Choose a lightweight pre-trained model → click **Deploy**.
7. Upload 5–10 images (small size) and test predictions.

Concept Learned

Computer vision, model deployment, endpoint testing.

Project 3 — Predict House Prices (Regression with Autopilot)

Goal: Predict prices based on size, bedrooms, and age.

Steps

8. Open **SageMaker Autopilot** → Create new experiment.
9. Upload small CSV dataset and choose target = `price`.
10. Run training → view top-performing model.
11. Deploy endpoint and test sample predictions.

Concept Learned

Regression modeling, AutoML, and tuning.

Project 4 — Sales Forecasting (Time Series)

Goal: Predict next 7 days of sales.

Steps

12. In **JumpStart**, search *forecasting* → select **DeepAR**.
13. Upload small CSV dataset (date, sales).
14. Train briefly and visualize forecasted results.

Concept Learned

Time series forecasting, monitoring trends, automation.

Project 5 — Fake News Headline Classifier

Goal: Classify headlines as real or fake.

Steps

15. Go to **JumpStart → Text Classification → Binary classifier.**
16. Upload CSV with columns `headline`, `label`.
17. Deploy endpoint → test headlines.

Concept Learned

Text classification, binary prediction, model deployment.

Extended Concepts — Applied to Projects

Concept	Applies To	Description
Hyperparameter Tuning	Projects 2, 3	Use SageMaker Automatic Model Tuning to improve accuracy (grid, random, or Bayesian search).
Model Deployment	All projects	Deploy via JumpStart or Autopilot; create endpoints for inference.
Model Monitoring	Projects 1, 4, 5	Use Model Monitor + CloudWatch to track prediction drift.
Maintenance & Retraining	Projects 3, 4, 5	Use SageMaker Pipelines for automated retraining.
Gradient Descent	Projects 2, 5	Understand how models learn by minimizing loss during

Concept	Applies To	Description
		training.

Cost & Safety Tips

- Always select **ml.t3.medium** (Free Tier eligible).
- Stop or delete endpoints when not in use.
- Set a billing alert (<$5) in AWS Budgets.
- Use small datasets and limit runtime hours.