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# Containerized Linear Regression Model for Shoe Size Prediction

Trained in Jupyter, Stored in S3, and Deployed via ECS Fargate with Streamlit UI

## Contents

Transforming Enterprises for Future

## 1. Overview

Built a web application that predicts shoe size from a person's height and gender using a trained linear regression model, fully deployed on AWS.
Here is the github repo: [aryan-madhavi/S3-Model-and-Containerized-App]

## 2. Dataset

**Sample Dataset:**

| Height | Gender | Shoe Size |
|---|---|---|
| 180 | M | 12 |
| 165 | F | 6 |

- Gender encoded as: M → 1, F → 0
- Final model trained on only Height and Gender
- Actual Dataset: Dataset

## 3. Model Training

Performed in a Google Collab Research notebook: model.ipynb
Used it to download the model.pkl file as well after the model was trained

## 4. Model Storage – AWS S3

- Created a Bucket: `am-regression-model`
- Uploaded the `model.pkl` file in the bucket

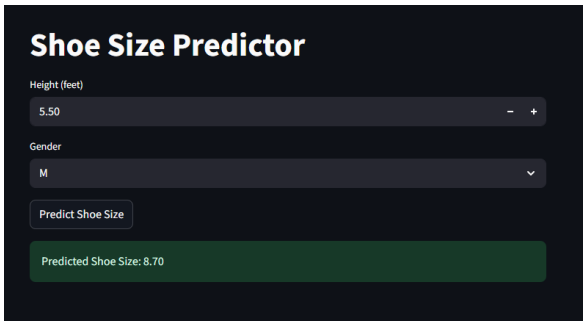
## 5. Web Application – Streamlit

**Features:**

- User inputs height and gender.
- Button triggers prediction.
- Displays predicted shoe size.

**Caching:**

- Uses @st.cache_resource(ttl=14400) to cache model for 4 hours.




## 6. Docker Image

The dockerfile has been used to build, tag and push the image to DockerHub:
docker.io/aryanfafo/shoe-size-predictor:v1

## 7. Deployment on AWS ECS Fargate

**Steps:**

1. **Created IAM Policy:**
   - Created a `ecsTaskS3ReadPolicy` and ` ecsTaskS3ReadRole` for `ECS` Service to allow S3 read

```
ecsTaskS3ReadPolicy
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "s3:GetObject"
            ],
            "Resource": [
                "arn:aws:s3:::am-regression-model/*"
            ]
        }
    ]
}
```

2. **Created ECS Cluster:**
   - Created a cluster name `shoe-size-predictor-cluster` with AWS Fargate as infra
3. **Created Task Definition:**
   - Created a cluster name `shoe-size-predictor-task` with AWS Fargate as infra
   - Set CPU to 0.5 vCPU and 1GB Memory
   - Assigned the `ecsTaskS3ReadRole` as Task Role
   - Map port 8501 container to 8501 host
   - Other default settings
4. **Start the Task:**
   - Navigate to the created cluster
   - Go to the Task subtab and run new task
   - Select `shoe-size-predictor-task`
   - Ensure the security group allows port 8051
   - Rest default configuration

## 8. Accessing the App

- Task gets a public IP: http://<public-ip>:8501
- You may also use the `nslookup public-ip` to get the FQDN