**Child Behaviour Habit Tracker**

**Overview:**

This dataset tracks lifestyle and behavioural habits of children and is intended for building a **supervised learning model** to classify their behaviour into one of the three categories:

* **Healthy**
* **Unhealthy**
* **Needs Improvement**

**Machine Learning Model Development Summary**

This is a **supervised classification problem**, where the goal is to predict the **Behaviour Category** based on input features. The target variable (Behavior\_Category) is **categorical and multi-class** (i.e., has more than two possible classes).

As part of the behaviour classification task using the **Child Behaviour Habit Tracker** dataset, the following steps were performed to build and evaluate a supervised classification model:

**1. Feature Selection**

* Selected the **top 5 features** based on variance:
  + Play\_Hours
  + Sleep\_Hours
  + Screen\_Time
  + Meals\_Per\_Day
  + Study\_Hours
* These features showed the most variability and potential impact on behaviour classification.

**2. Handling Class Imbalance**

* Applied the **SMOTE (Synthetic Minority Over-sampling Technique)** to balance the dataset, ensuring that the model is not biased toward the majority class.

**3. Model Training**

* Trained and evaluated the following **five classification algorithms**:
  + **Decision Tree**
  + **Logistic Regression**
  + **Support Vector Machine (SVM)**
  + **Random Forest**
  + **XGBoost**

**4. Model Selection**

* All the algorithms performed good, among all models I took **Decision Tree Classifier**.
* The performance was measured using the **F1 Score (weighted average)**:

f1 = f1\_score(y\_test, y\_pred, average='weighted')

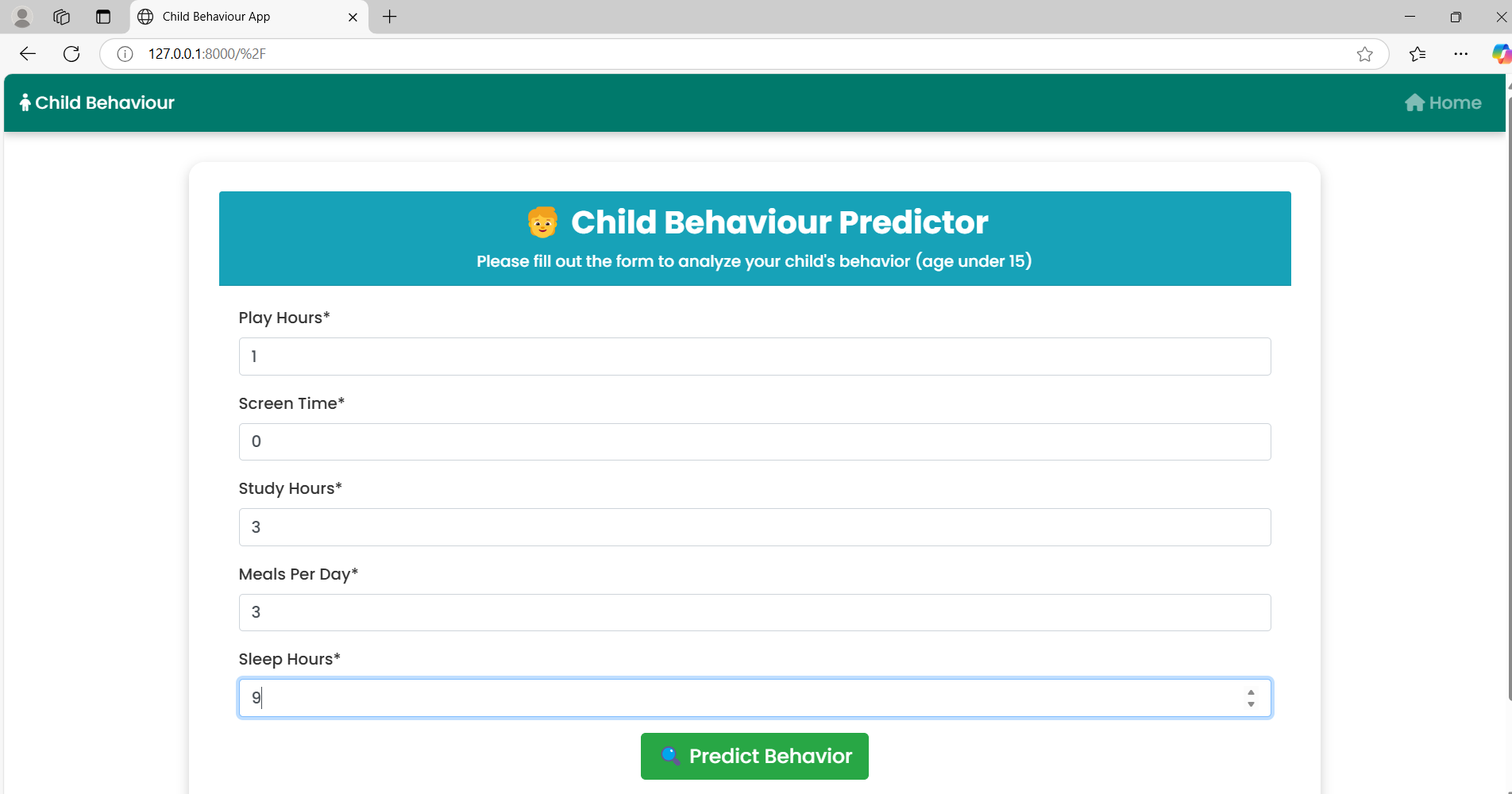
**5. Model Saving**

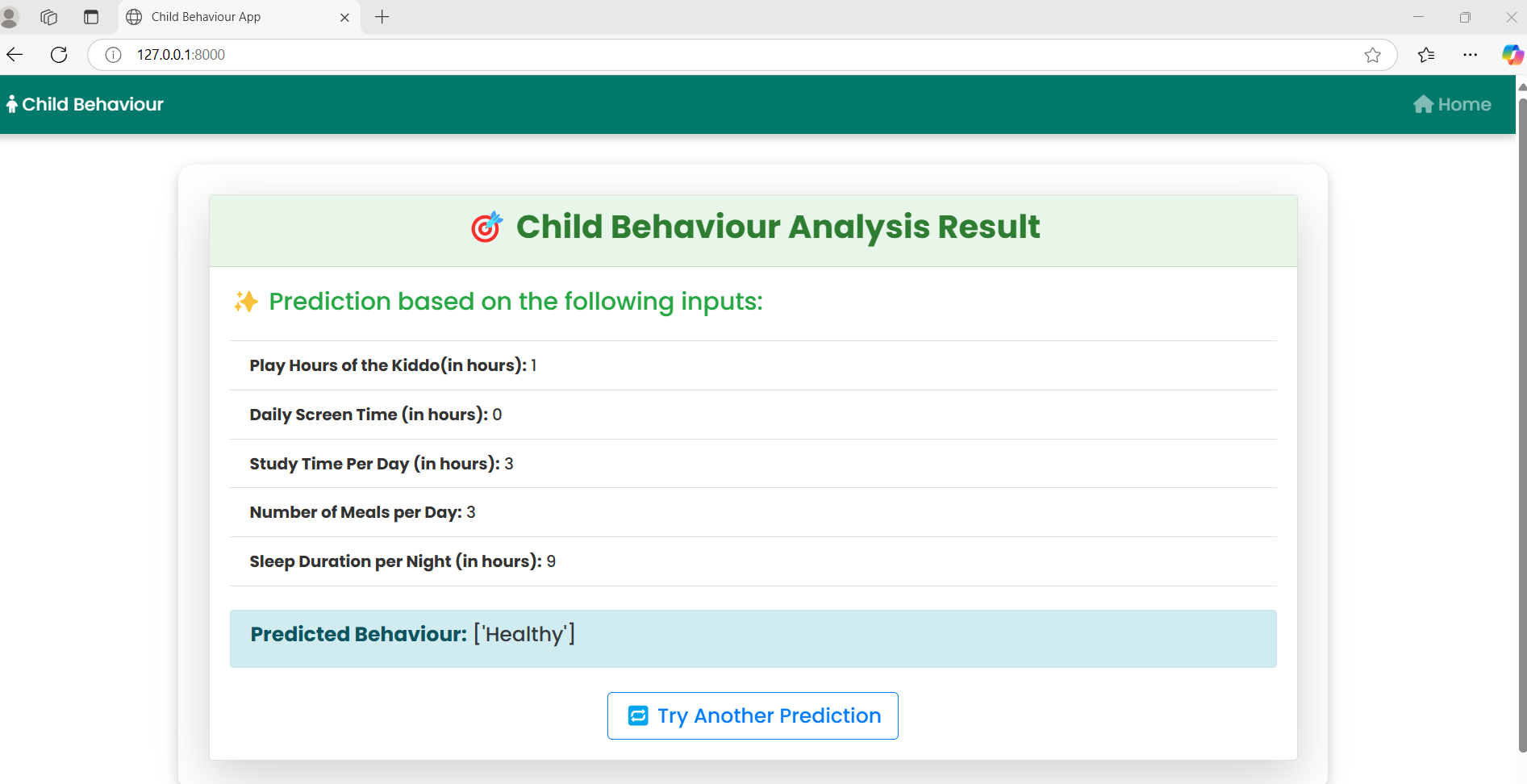
* The final **Decision Tree model** was serialized and saved using **joblib/pickle** as a .pkl file for future deployment and integration.

**6.Web Deployment Using Django**

* A simple **Django framework** was created to build a web-based prediction interface.
* Users can input the 5 selected features, and the model returns a prediction for the **Behaviour Category** (Healthy, Unhealthy, or Needs Improvement).

**Screenshots :**

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