

The image shows a Jupyter Notebook titled "Assinment Pattern.ipynb" in a VS Code editor. The notebook contains a Python script for a machine learning task. The script follows these steps:

- Step 1: Download Census data** - Downloads data from <https://archive.ics.uci.edu/ml/machine-learning-databases/adult/adult.data>.
- Step 2: Preprocessing** - Drops unnecessary columns and converts categorical variables into dummy/indicator variables using `pd.get_dummies(X)`.
- Step 3: Split data into training and testing sets** - Uses `train_test_split` with `test_size=0.3` and `random_state=42`.
- Step 4: Train Naive Bayes Classifier** - Instantiates `GaussianNB()` and fits it to the training data.
- Step 5: Predictions** - Uses `nb_classifier.predict(X_test)` to make predictions.
- Step 6: Compute Sensitivity and Specificity** - Uses `confusion_matrix` to calculate `tn`, `fp`, `fn`, and `tp`. Sensitivity is calculated as `tp / (tp + fn)` and specificity as `tn / (tn + fp)`.
- Step 7: Compute the posterior probability of making over 50K a year** - Uses `nb_classifier.predict_proba(X_test)` to get probabilities. It then finds the index for the '>50K' class and prints the posterior probabilities.

The output of the notebook shows the following results:

```
[11]:
... Sensitivity: 0.8292999135695764
Specificity: 0.7813547954393025
Posterior probability of making over 50K a year: [2.95609603e-06 9.46590997e-01 9.53379784e-01 ... 3.22947297e-06
9.85945065e-01 1.00000000e+00]
```