Assignment 2 – Machine learning

Question 1- Decision Trees

Tree when maximum gain split is used:

A close up of text on a white background

Description automatically generated

This tree is made in accordance with the maximum information gain split rules and formulas. After doing the calculations which are attached at the end of the assignment, we get:

* Entropy(User\_Action) = 1
* Entropy(Author) = Entropy(Where\_Read) = 1
* Entropy(Thread) = 0.85
* Entropy(Length) = 0.418

Hence the corresponding Information gains are:

* Information gain (Author) = Information gain (Where\_Read) = 1 – 1 = 0
* Information gain(Thread) = 1- 0.85 = 0.15
* Information gain(Length) = 1- 0.418 = 0.582

Since we see that length has highest IG, it comes as the root node in the decision tree and then followed by Thread and then Author. Author can be replaced by Where\_Reads and the tree will look same, since they both have equal IG.

1. If we change the algorithm to select the features in order (Author, Thread, Length, Where\_Read), the tree would look like this:

A close up of a map

Description automatically generated

The tree is very different from what we say in information gain split.

* This tree is very complex and complicated compared to the IG split tree. It has a lot of repeated nodes and even repeated sub-trees.
* The sub-tree Where\_Reads is practically serving no purpose, because it further splits into home and work which gives the same decision ‘reads’ or ‘skips’.
* The branch ‘length’ appears 4 times in this tree behaving the nearly same at every node. When the length is long, the user skips irrelevant of the Thread or Author. Similarly, when the length is short, the user always reads when the author is known and skips if the it’s a follow-up from an unknown author.
* Though this tree is less compact and seems less efficient compared to the IG split tree, it represents an equivalent algorithm since the output for a given input is same in this tree.

1. When the features are in order (Where\_Reads, Thread, Length, Author) the tree would like this:

A close up of a map

Description automatically generated

There are a lot of differences between this and IG split tree just like the one in previous question, but the tree in the previous question is similar to this tree in a lot of ways.

* The number of nodes and sub-trees are exactly same as the tree from previous question. It even looks similar to it. The reason being, the IG(Author) = IG(Where\_Reads). Swapping Author and Where\_Reads doesn’t affect the tree as their IGs are equal. Even in the IG split tree, only Author is there because it is sufficient to represent.
* The sub-tree of Thread is equal in both ‘home’ and ‘work’ branches.
* Just like the ‘Where\_Reads’ in previous question, ‘Author’ sub tree serves no purpose when the ‘length’ is short and it’s a new ‘thread’. When the ‘length’ is short in a ‘follow-up’ thread ‘Author’ sub-tree gives same decisions in both ‘home’ and ‘work’ cases.
* If the IGs of Author and Where\_Reads were to be different, then this tree would’ve been different from the one before.
* Just like the previous tree, this tree is less compact and seems less efficient compared to the IG split tree, it represents an equivalent algorithm since the output for a given input is same in this tree.

1. This tree can be used to correctly classify the training examples:

A close up of a map

Description automatically generated

* Though this tree is not perfect like the one made using the IG split, it serves the purpose of making a decision tree much better than the ones used in previous questions.
* It is small, not complicated and contains very less repetition of nodes and sub-trees.
* The only drawback of this tree is that length appears twice while behaving the same when its long in both the ‘new’ and ‘followup’ branches.

Question 2- Decision Trees

In cross validation, the best result is given when 10 folds are used. The following is the output WEKA produced:

Skip to page 28 for the end of this output.

=== Run information ===

Scheme: weka.classifiers.trees.J48 -C 0.25 -M 2

Relation: adult.data

Instances: 48842

Attributes: 15

age

workclass

fnlwgt

education

education-num

marital-status

occupation

relationship

race

sex

capital-gain

capital-loss

hours-per-week

native-country

class

Test mode: 10-fold cross-validation

=== Classifier model (full training set) ===

J48 pruned tree

------------------

capital-gain <= 6849

| marital-status = Married-civ-spouse

| | capital-loss <= 1844

| | | education-num <= 11

| | | | capital-gain <= 5060

| | | | | age <= 29: <=50K (1999.0/241.0)

| | | | | age > 29

| | | | | | hours-per-week <= 34: <=50K (1243.0/155.0)

| | | | | | hours-per-week > 34

| | | | | | | education-num <= 9: <=50K (6969.0/1820.0)

| | | | | | | education-num > 9

| | | | | | | | capital-loss <= 1510

| | | | | | | | | occupation = Tech-support

| | | | | | | | | | capital-gain <= 3103: >50K (169.69/71.36)

| | | | | | | | | | capital-gain > 3103: <=50K (12.05/2.0)

| | | | | | | | | occupation = Craft-repair

| | | | | | | | | | race = White

| | | | | | | | | | | workclass = Private

| | | | | | | | | | | | fnlwgt <= 152968

| | | | | | | | | | | | | age <= 49

| | | | | | | | | | | | | | capital-gain <= 1506: <=50K (153.71/41.51)

| | | | | | | | | | | | | | capital-gain > 1506

| | | | | | | | | | | | | | | capital-gain <= 3273: >50K (4.0)

| | | | | | | | | | | | | | | capital-gain > 3273: <=50K (7.0/2.0)

| | | | | | | | | | | | | age > 49

| | | | | | | | | | | | | | hours-per-week <= 51

| | | | | | | | | | | | | | | age <= 59: >50K (40.36/13.19)

| | | | | | | | | | | | | | | age > 59: <=50K (10.19/1.34)

| | | | | | | | | | | | | | hours-per-week > 51: <=50K (6.17/0.17)

| | | | | | | | | | | | fnlwgt > 152968

| | | | | | | | | | | | | hours-per-week <= 47

| | | | | | | | | | | | | | education = Bachelors: <=50K (0.0)

| | | | | | | | | | | | | | education = Some-college: <=50K (184.92/78.36)

| | | | | | | | | | | | | | education = 11th: <=50K (0.0)

| | | | | | | | | | | | | | education = HS-grad: <=50K (0.0)

| | | | | | | | | | | | | | education = Prof-school: <=50K (0.0)

| | | | | | | | | | | | | | education = Assoc-acdm: <=50K (0.0)

| | | | | | | | | | | | | | education = Assoc-voc

| | | | | | | | | | | | | | | fnlwgt <= 192344: <=50K (22.0/6.0)

| | | | | | | | | | | | | | | fnlwgt > 192344: >50K (39.17/14.17)

| | | | | | | | | | | | | | education = 9th: <=50K (0.0)

| | | | | | | | | | | | | | education = 7th-8th: <=50K (0.0)

| | | | | | | | | | | | | | education = 12th: <=50K (0.0)

| | | | | | | | | | | | | | education = Masters: <=50K (0.0)

| | | | | | | | | | | | | | education = 1st-4th: <=50K (0.0)

| | | | | | | | | | | | | | education = 10th: <=50K (0.0)

| | | | | | | | | | | | | | education = Doctorate: <=50K (0.0)

| | | | | | | | | | | | | | education = 5th-6th: <=50K (0.0)

| | | | | | | | | | | | | | education = Preschool: <=50K (0.0)

| | | | | | | | | | | | | hours-per-week > 47

| | | | | | | | | | | | | | education = Bachelors: >50K (0.0)

| | | | | | | | | | | | | | education = Some-college: >50K (66.36/25.02)

| | | | | | | | | | | | | | education = 11th: >50K (0.0)

| | | | | | | | | | | | | | education = HS-grad: >50K (0.0)

| | | | | | | | | | | | | | education = Prof-school: >50K (0.0)

| | | | | | | | | | | | | | education = Assoc-acdm: >50K (0.0)

| | | | | | | | | | | | | | education = Assoc-voc: <=50K (19.68/7.68)

| | | | | | | | | | | | | | education = 9th: >50K (0.0)

| | | | | | | | | | | | | | education = 7th-8th: >50K (0.0)

| | | | | | | | | | | | | | education = 12th: >50K (0.0)

| | | | | | | | | | | | | | education = Masters: >50K (0.0)

| | | | | | | | | | | | | | education = 1st-4th: >50K (0.0)

| | | | | | | | | | | | | | education = 10th: >50K (0.0)

| | | | | | | | | | | | | | education = Doctorate: >50K (0.0)

| | | | | | | | | | | | | | education = 5th-6th: >50K (0.0)

| | | | | | | | | | | | | | education = Preschool: >50K (0.0)

| | | | | | | | | | | workclass = Self-emp-not-inc: <=50K (97.87/21.63)

| | | | | | | | | | | workclass = Self-emp-inc

| | | | | | | | | | | | hours-per-week <= 59

| | | | | | | | | | | | | hours-per-week <= 42: <=50K (11.31/3.08)

| | | | | | | | | | | | | hours-per-week > 42: >50K (6.13/1.06)

| | | | | | | | | | | | hours-per-week > 59: <=50K (8.04/1.02)

| | | | | | | | | | | workclass = Federal-gov: <=50K (19.37/6.13)

| | | | | | | | | | | workclass = Local-gov: <=50K (25.49/8.16)

| | | | | | | | | | | workclass = State-gov: <=50K (10.19/4.07)

| | | | | | | | | | | workclass = Without-pay: <=50K (0.0)

| | | | | | | | | | | workclass = Never-worked: <=50K (0.0)

| | | | | | | | | | race = Asian-Pac-Islander

| | | | | | | | | | | age <= 47: <=50K (17.23/5.23)

| | | | | | | | | | | age > 47: >50K (7.68/1.23)

| | | | | | | | | | race = Amer-Indian-Eskimo

| | | | | | | | | | | age <= 38: <=50K (2.23)

| | | | | | | | | | | age > 38

| | | | | | | | | | | | age <= 44: >50K (2.0)

| | | | | | | | | | | | age > 44: <=50K (3.0/1.0)

| | | | | | | | | | race = Other: <=50K (2.23/1.0)

| | | | | | | | | | race = Black

| | | | | | | | | | | age <= 38: <=50K (6.45/1.0)

| | | | | | | | | | | age > 38: >50K (26.68/8.23)

| | | | | | | | | occupation = Other-service: <=50K (144.99/32.06)

| | | | | | | | | occupation = Sales

| | | | | | | | | | workclass = Private

| | | | | | | | | | | fnlwgt <= 89259: <=50K (67.76/17.19)

| | | | | | | | | | | fnlwgt > 89259

| | | | | | | | | | | | age <= 40: <=50K (119.89/49.47)

| | | | | | | | | | | | age > 40: >50K (147.25/56.46)

| | | | | | | | | | workclass = Self-emp-not-inc

| | | | | | | | | | | education = Bachelors: <=50K (0.0)

| | | | | | | | | | | education = Some-college

| | | | | | | | | | | | fnlwgt <= 345734: <=50K (52.01/13.27)

| | | | | | | | | | | | fnlwgt > 345734: >50K (7.08/0.02)

| | | | | | | | | | | education = 11th: <=50K (0.0)

| | | | | | | | | | | education = HS-grad: <=50K (0.0)

| | | | | | | | | | | education = Prof-school: <=50K (0.0)

| | | | | | | | | | | education = Assoc-acdm: <=50K (0.0)

| | | | | | | | | | | education = Assoc-voc

| | | | | | | | | | | | age <= 46: <=50K (5.11/1.08)

| | | | | | | | | | | | age > 46: >50K (3.19/0.1)

| | | | | | | | | | | education = 9th: <=50K (0.0)

| | | | | | | | | | | education = 7th-8th: <=50K (0.0)

| | | | | | | | | | | education = 12th: <=50K (0.0)

| | | | | | | | | | | education = Masters: <=50K (0.0)

| | | | | | | | | | | education = 1st-4th: <=50K (0.0)

| | | | | | | | | | | education = 10th: <=50K (0.0)

| | | | | | | | | | | education = Doctorate: <=50K (0.0)

| | | | | | | | | | | education = 5th-6th: <=50K (0.0)

| | | | | | | | | | | education = Preschool: <=50K (0.0)

| | | | | | | | | | workclass = Self-emp-inc

| | | | | | | | | | | hours-per-week <= 42

| | | | | | | | | | | | hours-per-week <= 39: >50K (4.1/1.05)

| | | | | | | | | | | | hours-per-week > 39: <=50K (11.69/2.16)

| | | | | | | | | | | hours-per-week > 42: >50K (42.41/12.2)

| | | | | | | | | | workclass = Federal-gov: <=50K (0.0)

| | | | | | | | | | workclass = Local-gov: <=50K (1.02/0.01)

| | | | | | | | | | workclass = State-gov: <=50K (2.04/1.01)

| | | | | | | | | | workclass = Without-pay: <=50K (0.0)

| | | | | | | | | | workclass = Never-worked: <=50K (0.0)

| | | | | | | | | occupation = Exec-managerial

| | | | | | | | | | workclass = Private

| | | | | | | | | | | relationship = Wife

| | | | | | | | | | | | hours-per-week <= 49: >50K (31.17/4.68)

| | | | | | | | | | | | hours-per-week > 49

| | | | | | | | | | | | | fnlwgt <= 107897: >50K (4.0/1.0)

| | | | | | | | | | | | | fnlwgt > 107897: <=50K (6.29/0.1)

| | | | | | | | | | | relationship = Own-child: <=50K (3.1/1.0)

| | | | | | | | | | | relationship = Husband: >50K (299.57/117.61)

| | | | | | | | | | | relationship = Not-in-family: >50K (0.0)

| | | | | | | | | | | relationship = Other-relative: >50K (2.0/1.0)

| | | | | | | | | | | relationship = Unmarried: >50K (0.0)

| | | | | | | | | | workclass = Self-emp-not-inc: <=50K (68.41/21.5)

| | | | | | | | | | workclass = Self-emp-inc: >50K (91.89/32.22)

| | | | | | | | | | workclass = Federal-gov: >50K (25.53/6.34)

| | | | | | | | | | workclass = Local-gov

| | | | | | | | | | | race = White

| | | | | | | | | | | | education = Bachelors: <=50K (0.0)

| | | | | | | | | | | | education = Some-college: <=50K (26.55/12.15)

| | | | | | | | | | | | education = 11th: <=50K (0.0)

| | | | | | | | | | | | education = HS-grad: <=50K (0.0)

| | | | | | | | | | | | education = Prof-school: <=50K (0.0)

| | | | | | | | | | | | education = Assoc-acdm: <=50K (0.0)

| | | | | | | | | | | | education = Assoc-voc

| | | | | | | | | | | | | fnlwgt <= 234428: >50K (7.12/2.06)

| | | | | | | | | | | | | fnlwgt > 234428: <=50K (2.05/0.03)

| | | | | | | | | | | | education = 9th: <=50K (0.0)

| | | | | | | | | | | | education = 7th-8th: <=50K (0.0)

| | | | | | | | | | | | education = 12th: <=50K (0.0)

| | | | | | | | | | | | education = Masters: <=50K (0.0)

| | | | | | | | | | | | education = 1st-4th: <=50K (0.0)

| | | | | | | | | | | | education = 10th: <=50K (0.0)

| | | | | | | | | | | | education = Doctorate: <=50K (0.0)

| | | | | | | | | | | | education = 5th-6th: <=50K (0.0)

| | | | | | | | | | | | education = Preschool: <=50K (0.0)

| | | | | | | | | | | race = Asian-Pac-Islander: >50K (0.05/0.01)

| | | | | | | | | | | race = Amer-Indian-Eskimo: >50K (3.01/1.01)

| | | | | | | | | | | race = Other: <=50K (0.01)

| | | | | | | | | | | race = Black: >50K (2.06/0.03)

| | | | | | | | | | workclass = State-gov

| | | | | | | | | | | relationship = Wife: >50K (3.1/1.06)

| | | | | | | | | | | relationship = Own-child: <=50K (0.01)

| | | | | | | | | | | relationship = Husband

| | | | | | | | | | | | age <= 45: <=50K (9.11/1.03)

| | | | | | | | | | | | age > 45: >50K (11.27/3.17)

| | | | | | | | | | | relationship = Not-in-family: <=50K (0.0)

| | | | | | | | | | | relationship = Other-relative: <=50K (0.0)

| | | | | | | | | | | relationship = Unmarried: <=50K (0.0)

| | | | | | | | | | workclass = Without-pay: >50K (0.0)

| | | | | | | | | | workclass = Never-worked: >50K (0.0)

| | | | | | | | | occupation = Prof-specialty

| | | | | | | | | | relationship = Wife

| | | | | | | | | | | capital-gain <= 3471: >50K (37.09/9.66)

| | | | | | | | | | | capital-gain > 3471: <=50K (2.0)

| | | | | | | | | | relationship = Own-child: <=50K (0.07)

| | | | | | | | | | relationship = Husband

| | | | | | | | | | | workclass = Private

| | | | | | | | | | | | hours-per-week <= 51: >50K (148.67/64.87)

| | | | | | | | | | | | hours-per-week > 51: <=50K (11.37/3.27)

| | | | | | | | | | | workclass = Self-emp-not-inc: <=50K (19.37/6.13)

| | | | | | | | | | | workclass = Self-emp-inc: <=50K (4.08/2.03)

| | | | | | | | | | | workclass = Federal-gov: >50K (12.23/3.15)

| | | | | | | | | | | workclass = Local-gov

| | | | | | | | | | | | hours-per-week <= 42: >50K (6.1/2.07)

| | | | | | | | | | | | hours-per-week > 42: <=50K (2.06/0.03)

| | | | | | | | | | | workclass = State-gov: >50K (14.27/5.18)

| | | | | | | | | | | workclass = Without-pay: >50K (0.0)

| | | | | | | | | | | workclass = Never-worked: >50K (0.0)

| | | | | | | | | | relationship = Not-in-family: >50K (0.0)

| | | | | | | | | | relationship = Other-relative: <=50K (1.0)

| | | | | | | | | | relationship = Unmarried: >50K (0.0)

| | | | | | | | | occupation = Handlers-cleaners: <=50K (92.91/18.68)

| | | | | | | | | occupation = Machine-op-inspct: <=50K (197.06/64.45)

| | | | | | | | | occupation = Adm-clerical

| | | | | | | | | | race = White

| | | | | | | | | | | workclass = Private

| | | | | | | | | | | | education = Bachelors: <=50K (0.0)

| | | | | | | | | | | | education = Some-college: <=50K (137.77/53.75)

| | | | | | | | | | | | education = 11th: <=50K (0.0)

| | | | | | | | | | | | education = HS-grad: <=50K (0.0)

| | | | | | | | | | | | education = Prof-school: <=50K (0.0)

| | | | | | | | | | | | education = Assoc-acdm: <=50K (0.0)

| | | | | | | | | | | | education = Assoc-voc

| | | | | | | | | | | | | fnlwgt <= 143312

| | | | | | | | | | | | | | hours-per-week <= 42

| | | | | | | | | | | | | | | fnlwgt <= 110213: <=50K (4.12/0.06)

| | | | | | | | | | | | | | | fnlwgt > 110213: >50K (3.12/0.06)

| | | | | | | | | | | | | | hours-per-week > 42: >50K (4.17/1.06)

| | | | | | | | | | | | | fnlwgt > 143312: <=50K (23.4/3.23)

| | | | | | | | | | | | education = 9th: <=50K (0.0)

| | | | | | | | | | | | education = 7th-8th: <=50K (0.0)

| | | | | | | | | | | | education = 12th: <=50K (0.0)

| | | | | | | | | | | | education = Masters: <=50K (0.0)

| | | | | | | | | | | | education = 1st-4th: <=50K (0.0)

| | | | | | | | | | | | education = 10th: <=50K (0.0)

| | | | | | | | | | | | education = Doctorate: <=50K (0.0)

| | | | | | | | | | | | education = 5th-6th: <=50K (0.0)

| | | | | | | | | | | | education = Preschool: <=50K (0.0)

| | | | | | | | | | | workclass = Self-emp-not-inc: >50K (4.08/1.06)

| | | | | | | | | | | workclass = Self-emp-inc: >50K (1.02/0.01)

| | | | | | | | | | | workclass = Federal-gov: >50K (45.95/16.63)

| | | | | | | | | | | workclass = Local-gov

| | | | | | | | | | | | sex = Female: <=50K (10.07/3.03)

| | | | | | | | | | | | sex = Male: >50K (8.31/2.21)

| | | | | | | | | | | workclass = State-gov: <=50K (11.23/4.08)

| | | | | | | | | | | workclass = Without-pay: <=50K (0.0)

| | | | | | | | | | | workclass = Never-worked: <=50K (0.0)

| | | | | | | | | | race = Asian-Pac-Islander: >50K (8.34/2.08)

| | | | | | | | | | race = Amer-Indian-Eskimo: <=50K (4.08/2.0)

| | | | | | | | | | race = Other: <=50K (0.08)

| | | | | | | | | | race = Black

| | | | | | | | | | | workclass = Private

| | | | | | | | | | | | hours-per-week <= 42

| | | | | | | | | | | | | fnlwgt <= 285200: <=50K (13.3/4.12)

| | | | | | | | | | | | | fnlwgt > 285200: >50K (5.0/1.0)

| | | | | | | | | | | | hours-per-week > 42: >50K (6.0)

| | | | | | | | | | | workclass = Self-emp-not-inc: >50K (0.0)

| | | | | | | | | | | workclass = Self-emp-inc: >50K (0.0)

| | | | | | | | | | | workclass = Federal-gov: >50K (5.06/1.04)

| | | | | | | | | | | workclass = Local-gov: <=50K (3.04/1.01)

| | | | | | | | | | | workclass = State-gov: <=50K (2.02/0.01)

| | | | | | | | | | | workclass = Without-pay: >50K (0.0)

| | | | | | | | | | | workclass = Never-worked: >50K (0.0)

| | | | | | | | | occupation = Farming-fishing: <=50K (146.01/30.07)

| | | | | | | | | occupation = Transport-moving

| | | | | | | | | | workclass = Private: <=50K (158.26/60.16)

| | | | | | | | | | workclass = Self-emp-not-inc

| | | | | | | | | | | education = Bachelors: <=50K (0.0)

| | | | | | | | | | | education = Some-college: <=50K (11.21/2.06)

| | | | | | | | | | | education = 11th: <=50K (0.0)

| | | | | | | | | | | education = HS-grad: <=50K (0.0)

| | | | | | | | | | | education = Prof-school: <=50K (0.0)

| | | | | | | | | | | education = Assoc-acdm: <=50K (0.0)

| | | | | | | | | | | education = Assoc-voc: >50K (2.06/0.03)

| | | | | | | | | | | education = 9th: <=50K (0.0)

| | | | | | | | | | | education = 7th-8th: <=50K (0.0)

| | | | | | | | | | | education = 12th: <=50K (0.0)

| | | | | | | | | | | education = Masters: <=50K (0.0)

| | | | | | | | | | | education = 1st-4th: <=50K (0.0)

| | | | | | | | | | | education = 10th: <=50K (0.0)

| | | | | | | | | | | education = Doctorate: <=50K (0.0)

| | | | | | | | | | | education = 5th-6th: <=50K (0.0)

| | | | | | | | | | | education = Preschool: <=50K (0.0)

| | | | | | | | | | workclass = Self-emp-inc: >50K (7.15/1.09)

| | | | | | | | | | workclass = Federal-gov

| | | | | | | | | | | race = White: >50K (2.07/0.05)

| | | | | | | | | | | race = Asian-Pac-Islander: >50K (0.0/0.0)

| | | | | | | | | | | race = Amer-Indian-Eskimo: <=50K (0.0)

| | | | | | | | | | | race = Other: <=50K (0.0)

| | | | | | | | | | | race = Black: <=50K (2.01/0.0)

| | | | | | | | | | workclass = Local-gov: <=50K (14.29/3.1)

| | | | | | | | | | workclass = State-gov: <=50K (4.08/0.03)

| | | | | | | | | | workclass = Without-pay: <=50K (0.0)

| | | | | | | | | | workclass = Never-worked: <=50K (0.0)

| | | | | | | | | occupation = Priv-house-serv: <=50K (0.0)

| | | | | | | | | occupation = Protective-serv

| | | | | | | | | | race = White

| | | | | | | | | | | workclass = Private: <=50K (19.39/2.13)

| | | | | | | | | | | workclass = Self-emp-not-inc: >50K (1.02/0.01)

| | | | | | | | | | | workclass = Self-emp-inc: >50K (1.02/0.01)

| | | | | | | | | | | workclass = Federal-gov

| | | | | | | | | | | | age <= 46: <=50K (2.03/0.01)

| | | | | | | | | | | | age > 46: >50K (2.06/0.03)

| | | | | | | | | | | workclass = Local-gov

| | | | | | | | | | | | education = Bachelors: >50K (0.0)

| | | | | | | | | | | | education = Some-college

| | | | | | | | | | | | | age <= 53

| | | | | | | | | | | | | | age <= 38: <=50K (32.35/13.03)

| | | | | | | | | | | | | | age > 38

| | | | | | | | | | | | | | | hours-per-week <= 36: <=50K (2.0)

| | | | | | | | | | | | | | | hours-per-week > 36

| | | | | | | | | | | | | | | | fnlwgt <= 121253

| | | | | | | | | | | | | | | | | fnlwgt <= 39411: >50K (3.0/1.0)

| | | | | | | | | | | | | | | | | fnlwgt > 39411: <=50K (4.09/0.03)

| | | | | | | | | | | | | | | | fnlwgt > 121253: >50K (27.21/3.15)

| | | | | | | | | | | | | age > 53: <=50K (5.77/0.27)

| | | | | | | | | | | | education = 11th: >50K (0.0)

| | | | | | | | | | | | education = HS-grad: >50K (0.0)

| | | | | | | | | | | | education = Prof-school: >50K (0.0)

| | | | | | | | | | | | education = Assoc-acdm: >50K (0.0)

| | | | | | | | | | | | education = Assoc-voc

| | | | | | | | | | | | | fnlwgt <= 112772: <=50K (2.12/0.06)

| | | | | | | | | | | | | fnlwgt > 112772: >50K (15.29/2.12)

| | | | | | | | | | | | education = 9th: >50K (0.0)

| | | | | | | | | | | | education = 7th-8th: >50K (0.0)

| | | | | | | | | | | | education = 12th: >50K (0.0)

| | | | | | | | | | | | education = Masters: >50K (0.0)

| | | | | | | | | | | | education = 1st-4th: >50K (0.0)

| | | | | | | | | | | | education = 10th: >50K (0.0)

| | | | | | | | | | | | education = Doctorate: >50K (0.0)

| | | | | | | | | | | | education = 5th-6th: >50K (0.0)

| | | | | | | | | | | | education = Preschool: >50K (0.0)

| | | | | | | | | | | workclass = State-gov

| | | | | | | | | | | | age <= 41: <=50K (9.13/0.03)

| | | | | | | | | | | | age > 41: >50K (15.35/6.22)

| | | | | | | | | | | workclass = Without-pay: <=50K (0.0)

| | | | | | | | | | | workclass = Never-worked: <=50K (0.0)

| | | | | | | | | | race = Asian-Pac-Islander: <=50K (2.18/0.14)

| | | | | | | | | | race = Amer-Indian-Eskimo: <=50K (1.05)

| | | | | | | | | | race = Other: >50K (2.05/0.05)

| | | | | | | | | | race = Black

| | | | | | | | | | | fnlwgt <= 154897: <=50K (3.14/0.05)

| | | | | | | | | | | fnlwgt > 154897: >50K (11.09/3.05)

| | | | | | | | | occupation = Armed-Forces: >50K (1.02/0.01)

| | | | | | | | capital-loss > 1510: <=50K (43.0/1.0)

| | | | capital-gain > 5060

| | | | | capital-gain <= 6612: >50K (111.0)

| | | | | capital-gain > 6612: <=50K (5.0)

| | | education-num > 11

| | | | hours-per-week <= 30

| | | | | sex = Female

| | | | | | race = White: >50K (145.0/54.0)

| | | | | | race = Asian-Pac-Islander: >50K (6.0/3.0)

| | | | | | race = Amer-Indian-Eskimo: <=50K (1.0)

| | | | | | race = Other: <=50K (1.0)

| | | | | | race = Black: <=50K (6.0/1.0)

| | | | | sex = Male: <=50K (386.0/111.0)

| | | | hours-per-week > 30

| | | | | age <= 33

| | | | | | age <= 25: <=50K (121.0/28.0)

| | | | | | age > 25

| | | | | | | education-num <= 12: <=50K (129.0/40.0)

| | | | | | | education-num > 12

| | | | | | | | native-country = United-States

| | | | | | | | | relationship = Wife: >50K (109.69/29.9)

| | | | | | | | | relationship = Own-child: <=50K (2.0)

| | | | | | | | | relationship = Husband

| | | | | | | | | | occupation = Tech-support

| | | | | | | | | | | education-num <= 13

| | | | | | | | | | | | hours-per-week <= 46

| | | | | | | | | | | | | fnlwgt <= 142049: >50K (4.0)

| | | | | | | | | | | | | fnlwgt > 142049

| | | | | | | | | | | | | | age <= 28: <=50K (2.0)

| | | | | | | | | | | | | | age > 28

| | | | | | | | | | | | | | | fnlwgt <= 168030: <=50K (2.0)

| | | | | | | | | | | | | | | fnlwgt > 168030: >50K (7.0/2.0)

| | | | | | | | | | | | hours-per-week > 46: <=50K (3.0)

| | | | | | | | | | | education-num > 13: >50K (2.06)

| | | | | | | | | | occupation = Craft-repair

| | | | | | | | | | | hours-per-week <= 42: <=50K (20.0/6.0)

| | | | | | | | | | | hours-per-week > 42: >50K (16.11/7.0)

| | | | | | | | | | occupation = Other-service

| | | | | | | | | | | fnlwgt <= 120676: >50K (2.0)

| | | | | | | | | | | fnlwgt > 120676: <=50K (7.93/1.03)

| | | | | | | | | | occupation = Sales

| | | | | | | | | | | workclass = Private: >50K (89.18/33.9)

| | | | | | | | | | | workclass = Self-emp-not-inc: <=50K (8.82/2.03)

| | | | | | | | | | | workclass = Self-emp-inc

| | | | | | | | | | | | age <= 30: >50K (4.03)

| | | | | | | | | | | | age > 30: <=50K (6.0/2.0)

| | | | | | | | | | | workclass = Federal-gov: >50K (0.0)

| | | | | | | | | | | workclass = Local-gov: <=50K (1.0/0.0)

| | | | | | | | | | | workclass = State-gov: >50K (0.0)

| | | | | | | | | | | workclass = Without-pay: >50K (0.0)

| | | | | | | | | | | workclass = Never-worked: >50K (0.0)

| | | | | | | | | | occupation = Exec-managerial

| | | | | | | | | | | education = Bachelors

| | | | | | | | | | | | age <= 29

| | | | | | | | | | | | | race = White: <=50K (49.0/22.0)

| | | | | | | | | | | | | race = Asian-Pac-Islander: <=50K (0.0)

| | | | | | | | | | | | | race = Amer-Indian-Eskimo: <=50K (0.0)

| | | | | | | | | | | | | race = Other: <=50K (0.0)

| | | | | | | | | | | | | race = Black: >50K (3.0)

| | | | | | | | | | | | age > 29: >50K (84.69/22.79)

| | | | | | | | | | | education = Some-college: >50K (0.0)

| | | | | | | | | | | education = 11th: >50K (0.0)

| | | | | | | | | | | education = HS-grad: >50K (0.0)

| | | | | | | | | | | education = Prof-school: >50K (0.0)

| | | | | | | | | | | education = Assoc-acdm: >50K (0.0)

| | | | | | | | | | | education = Assoc-voc: >50K (0.0)

| | | | | | | | | | | education = 9th: >50K (0.0)

| | | | | | | | | | | education = 7th-8th: >50K (0.0)

| | | | | | | | | | | education = 12th: >50K (0.0)

| | | | | | | | | | | education = Masters: >50K (17.24/2.0)

| | | | | | | | | | | education = 1st-4th: >50K (0.0)

| | | | | | | | | | | education = 10th: >50K (0.0)

| | | | | | | | | | | education = Doctorate: <=50K (1.24/0.24)

| | | | | | | | | | | education = 5th-6th: >50K (0.0)

| | | | | | | | | | | education = Preschool: >50K (0.0)

| | | | | | | | | | occupation = Prof-specialty

| | | | | | | | | | | workclass = Private

| | | | | | | | | | | | age <= 28

| | | | | | | | | | | | | education = Bachelors

| | | | | | | | | | | | | | hours-per-week <= 56: <=50K (20.79/6.0)

| | | | | | | | | | | | | | hours-per-week > 56: >50K (2.0)

| | | | | | | | | | | | | education = Some-college: <=50K (0.0)

| | | | | | | | | | | | | education = 11th: <=50K (0.0)

| | | | | | | | | | | | | education = HS-grad: <=50K (0.0)

| | | | | | | | | | | | | education = Prof-school

| | | | | | | | | | | | | | hours-per-week <= 55: >50K (2.0)

| | | | | | | | | | | | | | hours-per-week > 55: <=50K (2.0)

| | | | | | | | | | | | | education = Assoc-acdm: <=50K (0.0)

| | | | | | | | | | | | | education = Assoc-voc: <=50K (0.0)

| | | | | | | | | | | | | education = 9th: <=50K (0.0)

| | | | | | | | | | | | | education = 7th-8th: <=50K (0.0)

| | | | | | | | | | | | | education = 12th: <=50K (0.0)

| | | | | | | | | | | | | education = Masters

| | | | | | | | | | | | | | hours-per-week <= 46: >50K (4.0/1.0)

| | | | | | | | | | | | | | hours-per-week > 46: <=50K (3.0)

| | | | | | | | | | | | | education = 1st-4th: <=50K (0.0)

| | | | | | | | | | | | | education = 10th: <=50K (0.0)

| | | | | | | | | | | | | education = Doctorate: >50K (2.0/1.0)

| | | | | | | | | | | | | education = 5th-6th: <=50K (0.0)

| | | | | | | | | | | | | education = Preschool: <=50K (0.0)

| | | | | | | | | | | | age > 28: >50K (117.38/38.0)

| | | | | | | | | | | workclass = Self-emp-not-inc: >50K (11.03/2.0)

| | | | | | | | | | | workclass = Self-emp-inc: >50K (5.02/1.0)

| | | | | | | | | | | workclass = Federal-gov: >50K (11.93/4.0)

| | | | | | | | | | | workclass = Local-gov: <=50K (35.11/13.11)

| | | | | | | | | | | workclass = State-gov

| | | | | | | | | | | | education = Bachelors: >50K (7.0/2.0)

| | | | | | | | | | | | education = Some-college: >50K (0.0)

| | | | | | | | | | | | education = 11th: >50K (0.0)

| | | | | | | | | | | | education = HS-grad: >50K (0.0)

| | | | | | | | | | | | education = Prof-school: >50K (2.0/1.0)

| | | | | | | | | | | | education = Assoc-acdm: >50K (0.0)

| | | | | | | | | | | | education = Assoc-voc: >50K (0.0)

| | | | | | | | | | | | education = 9th: >50K (0.0)

| | | | | | | | | | | | education = 7th-8th: >50K (0.0)

| | | | | | | | | | | | education = 12th: >50K (0.0)

| | | | | | | | | | | | education = Masters

| | | | | | | | | | | | | fnlwgt <= 192740: <=50K (3.92/0.03)

| | | | | | | | | | | | | fnlwgt > 192740: >50K (3.0/1.0)

| | | | | | | | | | | | education = 1st-4th: >50K (0.0)

| | | | | | | | | | | | education = 10th: >50K (0.0)

| | | | | | | | | | | | education = Doctorate: >50K (1.92/0.9)

| | | | | | | | | | | | education = 5th-6th: >50K (0.0)

| | | | | | | | | | | | education = Preschool: >50K (0.0)

| | | | | | | | | | | workclass = Without-pay: >50K (0.0)

| | | | | | | | | | | workclass = Never-worked: >50K (0.0)

| | | | | | | | | | occupation = Handlers-cleaners

| | | | | | | | | | | hours-per-week <= 43: <=50K (3.0)

| | | | | | | | | | | hours-per-week > 43: >50K (2.91)

| | | | | | | | | | occupation = Machine-op-inspct: <=50K (5.91/1.02)

| | | | | | | | | | occupation = Adm-clerical

| | | | | | | | | | | age <= 31

| | | | | | | | | | | | age <= 29: <=50K (8.94/1.94)

| | | | | | | | | | | | age > 29: >50K (9.04/2.0)

| | | | | | | | | | | age > 31: <=50K (8.0/3.0)

| | | | | | | | | | occupation = Farming-fishing: <=50K (8.03/1.03)

| | | | | | | | | | occupation = Transport-moving: >50K (2.01/1.0)

| | | | | | | | | | occupation = Priv-house-serv: >50K (0.0)

| | | | | | | | | | occupation = Protective-serv

| | | | | | | | | | | hours-per-week <= 69

| | | | | | | | | | | | race = White

| | | | | | | | | | | | | fnlwgt <= 225339: <=50K (10.07/2.07)

| | | | | | | | | | | | | fnlwgt > 225339: >50K (4.0)

| | | | | | | | | | | | race = Asian-Pac-Islander: <=50K (0.0)

| | | | | | | | | | | | race = Amer-Indian-Eskimo: <=50K (0.0)

| | | | | | | | | | | | race = Other: <=50K (0.0)

| | | | | | | | | | | | race = Black: >50K (4.0/2.0)

| | | | | | | | | | | hours-per-week > 69: >50K (4.0)

| | | | | | | | | | occupation = Armed-Forces: >50K (0.0)

| | | | | | | | | relationship = Not-in-family: >50K (0.0)

| | | | | | | | | relationship = Other-relative: <=50K (6.0/1.0)

| | | | | | | | | relationship = Unmarried: >50K (0.0)

| | | | | | | | native-country = Cambodia: <=50K (1.02/0.01)

| | | | | | | | native-country = England

| | | | | | | | | age <= 32: >50K (2.1/0.06)

| | | | | | | | | age > 32: <=50K (3.01)

| | | | | | | | native-country = Puerto-Rico: <=50K (1.02/0.01)

| | | | | | | | native-country = Canada: <=50K (4.09/1.03)

| | | | | | | | native-country = Germany: <=50K (4.09/1.03)

| | | | | | | | native-country = Outlying-US(Guam-USVI-etc): >50K (0.0)

| | | | | | | | native-country = India

| | | | | | | | | workclass = Private: <=50K (10.16/2.07)

| | | | | | | | | workclass = Self-emp-not-inc: <=50K (0.06/0.01)

| | | | | | | | | workclass = Self-emp-inc: <=50K (0.0)

| | | | | | | | | workclass = Federal-gov: >50K (0.01)

| | | | | | | | | workclass = Local-gov: <=50K (0.01/0.0)

| | | | | | | | | workclass = State-gov: >50K (2.03/0.03)

| | | | | | | | | workclass = Without-pay: <=50K (0.0)

| | | | | | | | | workclass = Never-worked: <=50K (0.0)

| | | | | | | | native-country = Japan: <=50K (6.14/1.05)

| | | | | | | | native-country = Greece: >50K (1.02/0.01)

| | | | | | | | native-country = South: <=50K (1.02/0.01)

| | | | | | | | native-country = China

| | | | | | | | | fnlwgt <= 315203: <=50K (2.09/0.03)

| | | | | | | | | fnlwgt > 315203: >50K (2.0/0.0)

| | | | | | | | native-country = Cuba: >50K (3.07/1.04)

| | | | | | | | native-country = Iran: >50K (2.05/0.03)

| | | | | | | | native-country = Honduras: >50K (1.02/0.01)

| | | | | | | | native-country = Philippines: <=50K (6.14/3.05)

| | | | | | | | native-country = Italy: <=50K (1.02/0.01)

| | | | | | | | native-country = Poland: >50K (0.0)

| | | | | | | | native-country = Jamaica: <=50K (1.02/0.01)

| | | | | | | | native-country = Vietnam: >50K (1.02/0.01)

| | | | | | | | native-country = Mexico: <=50K (8.19/1.07)

| | | | | | | | native-country = Portugal: >50K (0.0)

| | | | | | | | native-country = Ireland: >50K (0.0)

| | | | | | | | native-country = France: >50K (3.07/0.04)

| | | | | | | | native-country = Dominican-Republic: <=50K (2.05/1.02)

| | | | | | | | native-country = Laos: >50K (0.0)

| | | | | | | | native-country = Ecuador: <=50K (2.05/0.02)

| | | | | | | | native-country = Taiwan: <=50K (3.07/1.03)

| | | | | | | | native-country = Haiti: <=50K (1.02/0.01)

| | | | | | | | native-country = Columbia: <=50K (3.07/1.03)

| | | | | | | | native-country = Hungary: >50K (0.0)

| | | | | | | | native-country = Guatemala: >50K (0.0)

| | | | | | | | native-country = Nicaragua: <=50K (1.02/0.01)

| | | | | | | | native-country = Scotland: >50K (0.0)

| | | | | | | | native-country = Thailand: >50K (1.02/0.01)

| | | | | | | | native-country = Yugoslavia: <=50K (2.05/1.02)

| | | | | | | | native-country = El-Salvador: <=50K (1.02/0.01)

| | | | | | | | native-country = Trinadad&Tobago: >50K (0.0)

| | | | | | | | native-country = Peru: >50K (0.0)

| | | | | | | | native-country = Hong

| | | | | | | | | age <= 29: >50K (2.05/0.02)

| | | | | | | | | age > 29: <=50K (3.07/1.01)

| | | | | | | | native-country = Holand-Netherlands: >50K (0.0)

| | | | | age > 33

| | | | | | occupation = Tech-support: >50K (128.28/38.19)

| | | | | | occupation = Craft-repair

| | | | | | | education = Bachelors

| | | | | | | | workclass = Private: >50K (90.34/37.74)

| | | | | | | | workclass = Self-emp-not-inc: <=50K (24.36/12.16)

| | | | | | | | workclass = Self-emp-inc: <=50K (10.15/3.07)

| | | | | | | | workclass = Federal-gov: >50K (3.05/1.02)

| | | | | | | | workclass = Local-gov

| | | | | | | | | hours-per-week <= 44: <=50K (8.11/1.03)

| | | | | | | | | hours-per-week > 44: >50K (3.06/0.02)

| | | | | | | | workclass = State-gov: >50K (3.05/1.02)

| | | | | | | | workclass = Without-pay: >50K (0.0)

| | | | | | | | workclass = Never-worked: >50K (0.0)

| | | | | | | education = Some-college: >50K (0.0)

| | | | | | | education = 11th: >50K (0.0)

| | | | | | | education = HS-grad: >50K (0.0)

| | | | | | | education = Prof-school: <=50K (5.39/2.22)

| | | | | | | education = Assoc-acdm

| | | | | | | | age <= 37: <=50K (15.06/3.0)

| | | | | | | | age > 37

| | | | | | | | | fnlwgt <= 153052: <=50K (18.11/5.06)

| | | | | | | | | fnlwgt > 153052: >50K (26.06/5.06)

| | | | | | | education = Assoc-voc: >50K (0.0)

| | | | | | | education = 9th: >50K (0.0)

| | | | | | | education = 7th-8th: >50K (0.0)

| | | | | | | education = 12th: >50K (0.0)

| | | | | | | education = Masters: >50K (20.11/8.5)

| | | | | | | education = 1st-4th: >50K (0.0)

| | | | | | | education = 10th: >50K (0.0)

| | | | | | | education = Doctorate: <=50K (1.22/0.11)

| | | | | | | education = 5th-6th: >50K (0.0)

| | | | | | | education = Preschool: >50K (0.0)

| | | | | | occupation = Other-service: <=50K (57.01/10.49)

| | | | | | occupation = Sales

| | | | | | | relationship = Wife: <=50K (18.92/7.4)

| | | | | | | relationship = Own-child: >50K (2.0)

| | | | | | | relationship = Husband: >50K (519.69/175.48)

| | | | | | | relationship = Not-in-family: >50K (0.0)

| | | | | | | relationship = Other-relative: <=50K (1.0)

| | | | | | | relationship = Unmarried: >50K (0.0)

| | | | | | occupation = Exec-managerial

| | | | | | | age <= 62: >50K (1132.64/264.89)

| | | | | | | age > 62

| | | | | | | | workclass = Private

| | | | | | | | | hours-per-week <= 46

| | | | | | | | | | hours-per-week <= 42: >50K (14.21/4.56)

| | | | | | | | | | hours-per-week > 42: <=50K (2.13)

| | | | | | | | | hours-per-week > 46: >50K (5.52/1.13)

| | | | | | | | workclass = Self-emp-not-inc: <=50K (6.9/0.33)

| | | | | | | | workclass = Self-emp-inc

| | | | | | | | | education-num <= 13: <=50K (10.15/4.33)

| | | | | | | | | education-num > 13: >50K (3.66/0.33)

| | | | | | | | workclass = Federal-gov: >50K (1.15/0.1)

| | | | | | | | workclass = Local-gov: <=50K (2.3/0.11)

| | | | | | | | workclass = State-gov: <=50K (2.3/0.11)

| | | | | | | | workclass = Without-pay: <=50K (0.0)

| | | | | | | | workclass = Never-worked: <=50K (0.0)

| | | | | | occupation = Prof-specialty

| | | | | | | education-num <= 14

| | | | | | | | hours-per-week <= 53

| | | | | | | | | capital-gain <= 1506: >50K (853.23/231.2)

| | | | | | | | | capital-gain > 1506

| | | | | | | | | | capital-gain <= 4687: >50K (19.7/3.35)

| | | | | | | | | | capital-gain > 4687

| | | | | | | | | | | capital-gain <= 5060: <=50K (7.0)

| | | | | | | | | | | capital-gain > 5060: >50K (10.35)

| | | | | | | | hours-per-week > 53

| | | | | | | | | education = Bachelors

| | | | | | | | | | relationship = Wife: <=50K (6.35/1.35)

| | | | | | | | | | relationship = Own-child: >50K (0.0)

| | | | | | | | | | relationship = Husband: >50K (85.11/29.7)

| | | | | | | | | | relationship = Not-in-family: <=50K (1.0)

| | | | | | | | | | relationship = Other-relative: >50K (0.0)

| | | | | | | | | | relationship = Unmarried: >50K (0.0)

| | | | | | | | | education = Some-college: >50K (0.0)

| | | | | | | | | education = 11th: >50K (0.0)

| | | | | | | | | education = HS-grad: >50K (0.0)

| | | | | | | | | education = Prof-school: >50K (0.0)

| | | | | | | | | education = Assoc-acdm: <=50K (7.35/1.0)

| | | | | | | | | education = Assoc-voc: >50K (0.0)

| | | | | | | | | education = 9th: >50K (0.0)

| | | | | | | | | education = 7th-8th: >50K (0.0)

| | | | | | | | | education = 12th: >50K (0.0)

| | | | | | | | | education = Masters

| | | | | | | | | | workclass = Private

| | | | | | | | | | | hours-per-week <= 65

| | | | | | | | | | | | age <= 38: >50K (5.0/1.0)

| | | | | | | | | | | | age > 38: <=50K (20.3/8.3)

| | | | | | | | | | | hours-per-week > 65: <=50K (2.0)

| | | | | | | | | | workclass = Self-emp-not-inc

| | | | | | | | | | | fnlwgt <= 194924: >50K (2.02)

| | | | | | | | | | | fnlwgt > 194924: <=50K (2.02/0.02)

| | | | | | | | | | workclass = Self-emp-inc: >50K (3.03/1.0)

| | | | | | | | | | workclass = Federal-gov: >50K (0.0)

| | | | | | | | | | workclass = Local-gov: >50K (19.21/6.0)

| | | | | | | | | | workclass = State-gov

| | | | | | | | | | | age <= 40: <=50K (4.06/1.06)

| | | | | | | | | | | age > 40: >50K (7.06)

| | | | | | | | | | workclass = Without-pay: >50K (0.0)

| | | | | | | | | | workclass = Never-worked: >50K (0.0)

| | | | | | | | | education = 1st-4th: >50K (0.0)

| | | | | | | | | education = 10th: >50K (0.0)

| | | | | | | | | education = Doctorate: >50K (0.0)

| | | | | | | | | education = 5th-6th: >50K (0.0)

| | | | | | | | | education = Preschool: >50K (0.0)

| | | | | | | education-num > 14: >50K (391.87/62.76)

| | | | | | occupation = Handlers-cleaners: <=50K (31.56/10.27)

| | | | | | occupation = Machine-op-inspct: <=50K (51.92/22.44)

| | | | | | occupation = Adm-clerical

| | | | | | | race = White

| | | | | | | | relationship = Wife

| | | | | | | | | age <= 57: >50K (32.18/7.0)

| | | | | | | | | age > 57: <=50K (3.12)

| | | | | | | | relationship = Own-child: <=50K (1.0)

| | | | | | | | relationship = Husband

| | | | | | | | | age <= 58

| | | | | | | | | | age <= 41: <=50K (54.29/22.06)

| | | | | | | | | | age > 41

| | | | | | | | | | | capital-gain <= 3942: >50K (84.11/24.47)

| | | | | | | | | | | capital-gain > 3942

| | | | | | | | | | | | capital-gain <= 5060: <=50K (3.0)

| | | | | | | | | | | | capital-gain > 5060: >50K (2.0)

| | | | | | | | | age > 58: <=50K (14.16/4.99)

| | | | | | | | relationship = Not-in-family: >50K (0.0)

| | | | | | | | relationship = Other-relative: >50K (1.0)

| | | | | | | | relationship = Unmarried: >50K (0.0)

| | | | | | | race = Asian-Pac-Islander: >50K (31.12/15.12)

| | | | | | | race = Amer-Indian-Eskimo: >50K (1.06)

| | | | | | | race = Other: >50K (1.0)

| | | | | | | race = Black: >50K (12.23/3.12)

| | | | | | occupation = Farming-fishing

| | | | | | | workclass = Private: <=50K (20.36/6.17)

| | | | | | | workclass = Self-emp-not-inc: <=50K (41.74/10.36)

| | | | | | | workclass = Self-emp-inc: >50K (6.11/0.06)

| | | | | | | workclass = Federal-gov: <=50K (2.04/1.02)

| | | | | | | workclass = Local-gov: <=50K (0.0)

| | | | | | | workclass = State-gov: >50K (1.02/0.01)

| | | | | | | workclass = Without-pay: <=50K (1.02/0.01)

| | | | | | | workclass = Never-worked: <=50K (0.0)

| | | | | | occupation = Transport-moving: <=50K (54.98/20.47)

| | | | | | occupation = Priv-house-serv: <=50K (2.04/0.02)

| | | | | | occupation = Protective-serv

| | | | | | | age <= 42

| | | | | | | | capital-gain <= 1506

| | | | | | | | | race = White: <=50K (25.15/8.06)

| | | | | | | | | race = Asian-Pac-Islander: >50K (1.0)

| | | | | | | | | race = Amer-Indian-Eskimo: <=50K (0.0)

| | | | | | | | | race = Other: <=50K (0.0)

| | | | | | | | | race = Black

| | | | | | | | | | age <= 39: <=50K (2.0)

| | | | | | | | | | age > 39: >50K (2.0)

| | | | | | | | capital-gain > 1506: >50K (2.02/0.02)

| | | | | | | age > 42: >50K (44.19/7.59)

| | | | | | occupation = Armed-Forces: >50K (1.02/0.01)

| | capital-loss > 1844

| | | capital-loss <= 1980: >50K (857.0/18.0)

| | | capital-loss > 1980

| | | | capital-loss <= 2163: <=50K (104.0)

| | | | capital-loss > 2163

| | | | | capital-loss <= 2415

| | | | | | capital-loss <= 2377

| | | | | | | age <= 64: <=50K (38.0/4.0)

| | | | | | | age > 64: >50K (30.0/3.0)

| | | | | | capital-loss > 2377: >50K (82.0)

| | | | | capital-loss > 2415: <=50K (14.0)

| marital-status = Divorced

| | education-num <= 12: <=50K (5220.0/225.0)

| | education-num > 12

| | | hours-per-week <= 42

| | | | capital-loss <= 1726: <=50K (722.0/87.0)

| | | | capital-loss > 1726

| | | | | capital-loss <= 2415: <=50K (21.0/5.0)

| | | | | capital-loss > 2415: >50K (7.0/1.0)

| | | hours-per-week > 42

| | | | occupation = Tech-support: <=50K (4.07/1.0)

| | | | occupation = Craft-repair: <=50K (12.2/2.0)

| | | | occupation = Other-service: <=50K (13.22/6.0)

| | | | occupation = Sales: <=50K (72.19/25.0)

| | | | occupation = Exec-managerial

| | | | | capital-loss <= 1485

| | | | | | race = White

| | | | | | | education = Bachelors

| | | | | | | | workclass = Private

| | | | | | | | | relationship = Wife: <=50K (0.0)

| | | | | | | | | relationship = Own-child: >50K (2.0/1.0)

| | | | | | | | | relationship = Husband: <=50K (0.0)

| | | | | | | | | relationship = Not-in-family

| | | | | | | | | | sex = Female: >50K (17.67/6.67)

| | | | | | | | | | sex = Male: <=50K (22.45/10.0)

| | | | | | | | | relationship = Other-relative: <=50K (1.0)

| | | | | | | | | relationship = Unmarried

| | | | | | | | | | sex = Female: <=50K (9.0/2.0)

| | | | | | | | | | sex = Male: >50K (5.0/1.0)

| | | | | | | | workclass = Self-emp-not-inc

| | | | | | | | | age <= 33: >50K (2.03/0.03)

| | | | | | | | | age > 33: <=50K (6.13)

| | | | | | | | workclass = Self-emp-inc

| | | | | | | | | hours-per-week <= 57

| | | | | | | | | | sex = Female: <=50K (2.06)

| | | | | | | | | | sex = Male

| | | | | | | | | | | age <= 44: <=50K (2.06)

| | | | | | | | | | | age > 44: >50K (2.0)

| | | | | | | | | hours-per-week > 57: >50K (2.03/0.03)

| | | | | | | | workclass = Federal-gov

| | | | | | | | | hours-per-week <= 52: <=50K (2.06)

| | | | | | | | | hours-per-week > 52: >50K (2.02/0.02)

| | | | | | | | workclass = Local-gov: <=50K (0.0)

| | | | | | | | workclass = State-gov: >50K (1.02/0.02)

| | | | | | | | workclass = Without-pay: <=50K (0.0)

| | | | | | | | workclass = Never-worked: <=50K (0.0)

| | | | | | | education = Some-college: <=50K (0.0)

| | | | | | | education = 11th: <=50K (0.0)

| | | | | | | education = HS-grad: <=50K (0.0)

| | | | | | | education = Prof-school: <=50K (1.31)

| | | | | | | education = Assoc-acdm: <=50K (0.0)

| | | | | | | education = Assoc-voc: <=50K (0.0)

| | | | | | | education = 9th: <=50K (0.0)

| | | | | | | education = 7th-8th: <=50K (0.0)

| | | | | | | education = 12th: <=50K (0.0)

| | | | | | | education = Masters

| | | | | | | | capital-loss <= 0

| | | | | | | | | hours-per-week <= 67: >50K (32.61/11.61)

| | | | | | | | | hours-per-week > 67: <=50K (6.0/1.0)

| | | | | | | | capital-loss > 0: <=50K (3.0)

| | | | | | | education = 1st-4th: <=50K (0.0)

| | | | | | | education = 10th: <=50K (0.0)

| | | | | | | education = Doctorate: >50K (4.0/1.0)

| | | | | | | education = 5th-6th: <=50K (0.0)

| | | | | | | education = Preschool: <=50K (0.0)

| | | | | | race = Asian-Pac-Islander: <=50K (3.0/1.0)

| | | | | | race = Amer-Indian-Eskimo: <=50K (1.0)

| | | | | | race = Other: <=50K (0.0)

| | | | | | race = Black

| | | | | | | fnlwgt <= 171306: >50K (5.0)

| | | | | | | fnlwgt > 171306: <=50K (4.0/1.0)

| | | | | capital-loss > 1485: >50K (10.0)

| | | | occupation = Prof-specialty

| | | | | education-num <= 14: <=50K (159.81/32.0)

| | | | | education-num > 14

| | | | | | capital-gain <= 1086

| | | | | | | relationship = Wife: >50K (0.0)

| | | | | | | relationship = Own-child: >50K (1.0)

| | | | | | | relationship = Husband: >50K (0.0)

| | | | | | | relationship = Not-in-family

| | | | | | | | hours-per-week <= 52

| | | | | | | | | hours-per-week <= 47: >50K (6.0)

| | | | | | | | | hours-per-week > 47: <=50K (7.0/1.0)

| | | | | | | | hours-per-week > 52: >50K (9.0)

| | | | | | | relationship = Other-relative: >50K (0.0)

| | | | | | | relationship = Unmarried

| | | | | | | | sex = Female: <=50K (4.0)

| | | | | | | | sex = Male: >50K (5.0/1.0)

| | | | | | capital-gain > 1086: <=50K (2.4)

| | | | occupation = Handlers-cleaners: <=50K (2.03/1.0)

| | | | occupation = Machine-op-inspct: <=50K (2.03)

| | | | occupation = Adm-clerical: <=50K (13.22/1.0)

| | | | occupation = Farming-fishing: <=50K (4.07)

| | | | occupation = Transport-moving: <=50K (7.12/1.0)

| | | | occupation = Priv-house-serv: <=50K (1.02)

| | | | occupation = Protective-serv

| | | | | race = White: <=50K (6.17/2.0)

| | | | | race = Asian-Pac-Islander: >50K (0.0)

| | | | | race = Amer-Indian-Eskimo: >50K (0.0)

| | | | | race = Other: >50K (0.0)

| | | | | race = Black: >50K (4.0)

| | | | occupation = Armed-Forces: <=50K (0.0)

| marital-status = Never-married

| | education-num <= 12

| | | capital-loss <= 2206: <=50K (12461.0/146.0)

| | | capital-loss > 2206

| | | | capital-loss <= 2377: <=50K (17.0/3.0)

| | | | capital-loss > 2377: >50K (11.0/1.0)

| | education-num > 12

| | | education-num <= 14

| | | | hours-per-week <= 43: <=50K (2266.0/117.0)

| | | | hours-per-week > 43

| | | | | capital-loss <= 1485: <=50K (887.0/155.0)

| | | | | capital-loss > 1485

| | | | | | capital-loss <= 1573: >50K (11.0/2.0)

| | | | | | capital-loss > 1573

| | | | | | | capital-loss <= 2377: <=50K (35.0/3.0)

| | | | | | | capital-loss > 2377: >50K (6.0)

| | | education-num > 14

| | | | age <= 32: <=50K (82.0/9.0)

| | | | age > 32

| | | | | capital-loss <= 1485

| | | | | | hours-per-week <= 26: <=50K (7.0)

| | | | | | hours-per-week > 26

| | | | | | | occupation = Tech-support: >50K (0.0)

| | | | | | | occupation = Craft-repair: >50K (1.02/0.01)

| | | | | | | occupation = Other-service: >50K (2.04/1.02)

| | | | | | | occupation = Sales: <=50K (1.02/0.01)

| | | | | | | occupation = Exec-managerial

| | | | | | | | age <= 36: <=50K (2.13/0.13)

| | | | | | | | age > 36: >50K (12.13/1.13)

| | | | | | | occupation = Prof-specialty

| | | | | | | | age <= 52

| | | | | | | | | workclass = Private

| | | | | | | | | | sex = Female: >50K (10.0/3.0)

| | | | | | | | | | sex = Male

| | | | | | | | | | | hours-per-week <= 43: >50K (10.0/1.0)

| | | | | | | | | | | hours-per-week > 43: <=50K (7.32/1.32)

| | | | | | | | | workclass = Self-emp-not-inc

| | | | | | | | | | sex = Female

| | | | | | | | | | | hours-per-week <= 52: <=50K (3.0)

| | | | | | | | | | | hours-per-week > 52: >50K (2.0)

| | | | | | | | | | sex = Male: >50K (13.21/2.0)

| | | | | | | | | workclass = Self-emp-inc: >50K (2.02/1.0)

| | | | | | | | | workclass = Federal-gov: >50K (5.06/1.0)

| | | | | | | | | workclass = Local-gov

| | | | | | | | | | age <= 46: >50K (3.06/1.0)

| | | | | | | | | | age > 46: <=50K (2.0)

| | | | | | | | | workclass = State-gov: <=50K (11.13/2.13)

| | | | | | | | | workclass = Without-pay: >50K (0.0)

| | | | | | | | | workclass = Never-worked: >50K (0.0)

| | | | | | | | age > 52: <=50K (17.79/3.0)

| | | | | | | occupation = Handlers-cleaners: >50K (0.0)

| | | | | | | occupation = Machine-op-inspct: >50K (1.02/0.01)

| | | | | | | occupation = Adm-clerical: >50K (1.02/0.01)

| | | | | | | occupation = Farming-fishing: <=50K (2.04/0.02)

| | | | | | | occupation = Transport-moving: >50K (0.0)

| | | | | | | occupation = Priv-house-serv: >50K (0.0)

| | | | | | | occupation = Protective-serv: >50K (0.0)

| | | | | | | occupation = Armed-Forces: >50K (0.0)

| | | | | capital-loss > 1485: >50K (16.0/2.0)

| marital-status = Separated

| | education-num <= 12: <=50K (1318.0/36.0)

| | education-num > 12

| | | education = Bachelors: <=50K (129.0/20.0)

| | | education = Some-college: <=50K (0.0)

| | | education = 11th: <=50K (0.0)

| | | education = HS-grad: <=50K (0.0)

| | | education = Prof-school

| | | | race = White: >50K (7.0/1.0)

| | | | race = Asian-Pac-Islander: >50K (0.0)

| | | | race = Amer-Indian-Eskimo: >50K (0.0)

| | | | race = Other: >50K (0.0)

| | | | race = Black: <=50K (2.0)

| | | education = Assoc-acdm: <=50K (0.0)

| | | education = Assoc-voc: <=50K (0.0)

| | | education = 9th: <=50K (0.0)

| | | education = 7th-8th: <=50K (0.0)

| | | education = 12th: <=50K (0.0)

| | | education = Masters

| | | | sex = Female: <=50K (24.0/2.0)

| | | | sex = Male

| | | | | age <= 45: >50K (5.0)

| | | | | age > 45: <=50K (10.0/3.0)

| | | education = 1st-4th: <=50K (0.0)

| | | education = 10th: <=50K (0.0)

| | | education = Doctorate

| | | | fnlwgt <= 192286: <=50K (5.0)

| | | | fnlwgt > 192286: >50K (5.0/1.0)

| | | education = 5th-6th: <=50K (0.0)

| | | education = Preschool: <=50K (0.0)

| marital-status = Widowed

| | capital-loss <= 2205: <=50K (1460.0/82.0)

| | capital-loss > 2205

| | | race = White: >50K (23.0/9.0)

| | | race = Asian-Pac-Islander: >50K (0.0)

| | | race = Amer-Indian-Eskimo: >50K (0.0)

| | | race = Other: >50K (0.0)

| | | race = Black: <=50K (2.0)

| marital-status = Married-spouse-absent: <=50K (613.0/44.0)

| marital-status = Married-AF-spouse: <=50K (35.0/12.0)

capital-gain > 6849

| hours-per-week <= 35

| | age <= 27

| | | capital-gain <= 22040: >50K (3.0)

| | | capital-gain > 22040: <=50K (6.0)

| | age > 27: >50K (165.0/6.0)

| hours-per-week > 35: >50K (1881.0/16.0)

Number of Leaves : 696

Size of the tree : 911

Time taken to build model: 2.56 seconds

=== Stratified cross-validation ===

=== Summary ===

Correctly Classified Instances 42050 86.0939 %

Incorrectly Classified Instances 6792 13.9061 %

Kappa statistic 0.587

Mean absolute error 0.1962

Root mean squared error 0.3203

Relative absolute error 53.8831 %

Root relative squared error 75.0717 %

Total Number of Instances 48842

=== Detailed Accuracy By Class ===

TP Rate FP Rate Precision Recall F-Measure MCC ROC Area PRC Area Class

0.600 0.057 0.768 0.600 0.674 0.594 0.890 0.758 >50K

0.943 0.400 0.882 0.943 0.912 0.594 0.890 0.951 <=50K

Weighted Avg. 0.861 0.318 0.855 0.861 0.855 0.594 0.890 0.905

=== Confusion Matrix ===

a b <-- classified as

7009 4678 | a = >50K

2114 35041 | b = <=50K

* This Method is fairly accurate as you can see 86.09% of the results are correctly classified.
* I took 10 fold validation because it gave the best accuracy while taking less time than others.
* The following is the accuracy output for 9 fold validation:

=== Summary ===

Correctly Classified Instances 42049 86.0919 %

Incorrectly Classified Instances 6793 13.9081 %

Kappa statistic 0.5869

Mean absolute error 0.1958

Root mean squared error 0.3204

Relative absolute error 53.7745 %

Root relative squared error 75.086 %

Total Number of Instances 48842

* This takes a few milliseconds more time that 10 fold while giving nearly the same accuracy for classification.
* The following is the accuracy output for 11 fold validation:

=== Summary ===

Correctly Classified Instances 42026 86.0448 %

Incorrectly Classified Instances 6816 13.9552 %

Kappa statistic 0.5846

Mean absolute error 0.1964

Root mean squared error 0.3205

Relative absolute error 53.9435 %

Root relative squared error 75.1315 %

Total Number of Instances 48842

* Though this takes a few milliseconds less than the 10 fold, it gives off the accuracy by a very few numbers.

So, in my opinion, 10 fold validation is the best pick while using cross validation in WEKA.

For the percentage split, 70% split (70% data for training, rest for testing) is the most appropriate. The following is the output for 70% data split:

Skip to page 52 for the end of this output.

=== Run information ===

Scheme: weka.classifiers.trees.J48 -C 0.25 -M 2

Relation: adult.data

Instances: 48842

Attributes: 15

age

workclass

fnlwgt

education

education-num

marital-status

occupation

relationship

race

sex

capital-gain

capital-loss

hours-per-week

native-country

class

Test mode: split 70.0% train, remainder test

=== Classifier model (full training set) ===

J48 pruned tree

------------------

capital-gain <= 6849

| marital-status = Married-civ-spouse

| | capital-loss <= 1844

| | | education-num <= 11

| | | | capital-gain <= 5060

| | | | | age <= 29: <=50K (1999.0/241.0)

| | | | | age > 29

| | | | | | hours-per-week <= 34: <=50K (1243.0/155.0)

| | | | | | hours-per-week > 34

| | | | | | | education-num <= 9: <=50K (6969.0/1820.0)

| | | | | | | education-num > 9

| | | | | | | | capital-loss <= 1510

| | | | | | | | | occupation = Tech-support

| | | | | | | | | | capital-gain <= 3103: >50K (169.69/71.36)

| | | | | | | | | | capital-gain > 3103: <=50K (12.05/2.0)

| | | | | | | | | occupation = Craft-repair

| | | | | | | | | | race = White

| | | | | | | | | | | workclass = Private

| | | | | | | | | | | | fnlwgt <= 152968

| | | | | | | | | | | | | age <= 49

| | | | | | | | | | | | | | capital-gain <= 1506: <=50K (153.71/41.51)

| | | | | | | | | | | | | | capital-gain > 1506

| | | | | | | | | | | | | | | capital-gain <= 3273: >50K (4.0)

| | | | | | | | | | | | | | | capital-gain > 3273: <=50K (7.0/2.0)

| | | | | | | | | | | | | age > 49

| | | | | | | | | | | | | | hours-per-week <= 51

| | | | | | | | | | | | | | | age <= 59: >50K (40.36/13.19)

| | | | | | | | | | | | | | | age > 59: <=50K (10.19/1.34)

| | | | | | | | | | | | | | hours-per-week > 51: <=50K (6.17/0.17)

| | | | | | | | | | | | fnlwgt > 152968

| | | | | | | | | | | | | hours-per-week <= 47

| | | | | | | | | | | | | | education = Bachelors: <=50K (0.0)

| | | | | | | | | | | | | | education = Some-college: <=50K (184.92/78.36)

| | | | | | | | | | | | | | education = 11th: <=50K (0.0)

| | | | | | | | | | | | | | education = HS-grad: <=50K (0.0)

| | | | | | | | | | | | | | education = Prof-school: <=50K (0.0)

| | | | | | | | | | | | | | education = Assoc-acdm: <=50K (0.0)

| | | | | | | | | | | | | | education = Assoc-voc

| | | | | | | | | | | | | | | fnlwgt <= 192344: <=50K (22.0/6.0)

| | | | | | | | | | | | | | | fnlwgt > 192344: >50K (39.17/14.17)

| | | | | | | | | | | | | | education = 9th: <=50K (0.0)

| | | | | | | | | | | | | | education = 7th-8th: <=50K (0.0)

| | | | | | | | | | | | | | education = 12th: <=50K (0.0)

| | | | | | | | | | | | | | education = Masters: <=50K (0.0)

| | | | | | | | | | | | | | education = 1st-4th: <=50K (0.0)

| | | | | | | | | | | | | | education = 10th: <=50K (0.0)

| | | | | | | | | | | | | | education = Doctorate: <=50K (0.0)

| | | | | | | | | | | | | | education = 5th-6th: <=50K (0.0)

| | | | | | | | | | | | | | education = Preschool: <=50K (0.0)

| | | | | | | | | | | | | hours-per-week > 47

| | | | | | | | | | | | | | education = Bachelors: >50K (0.0)

| | | | | | | | | | | | | | education = Some-college: >50K (66.36/25.02)

| | | | | | | | | | | | | | education = 11th: >50K (0.0)

| | | | | | | | | | | | | | education = HS-grad: >50K (0.0)

| | | | | | | | | | | | | | education = Prof-school: >50K (0.0)

| | | | | | | | | | | | | | education = Assoc-acdm: >50K (0.0)

| | | | | | | | | | | | | | education = Assoc-voc: <=50K (19.68/7.68)

| | | | | | | | | | | | | | education = 9th: >50K (0.0)

| | | | | | | | | | | | | | education = 7th-8th: >50K (0.0)

| | | | | | | | | | | | | | education = 12th: >50K (0.0)

| | | | | | | | | | | | | | education = Masters: >50K (0.0)

| | | | | | | | | | | | | | education = 1st-4th: >50K (0.0)

| | | | | | | | | | | | | | education = 10th: >50K (0.0)

| | | | | | | | | | | | | | education = Doctorate: >50K (0.0)

| | | | | | | | | | | | | | education = 5th-6th: >50K (0.0)

| | | | | | | | | | | | | | education = Preschool: >50K (0.0)

| | | | | | | | | | | workclass = Self-emp-not-inc: <=50K (97.87/21.63)

| | | | | | | | | | | workclass = Self-emp-inc

| | | | | | | | | | | | hours-per-week <= 59

| | | | | | | | | | | | | hours-per-week <= 42: <=50K (11.31/3.08)

| | | | | | | | | | | | | hours-per-week > 42: >50K (6.13/1.06)

| | | | | | | | | | | | hours-per-week > 59: <=50K (8.04/1.02)

| | | | | | | | | | | workclass = Federal-gov: <=50K (19.37/6.13)

| | | | | | | | | | | workclass = Local-gov: <=50K (25.49/8.16)

| | | | | | | | | | | workclass = State-gov: <=50K (10.19/4.07)

| | | | | | | | | | | workclass = Without-pay: <=50K (0.0)

| | | | | | | | | | | workclass = Never-worked: <=50K (0.0)

| | | | | | | | | | race = Asian-Pac-Islander

| | | | | | | | | | | age <= 47: <=50K (17.23/5.23)

| | | | | | | | | | | age > 47: >50K (7.68/1.23)

| | | | | | | | | | race = Amer-Indian-Eskimo

| | | | | | | | | | | age <= 38: <=50K (2.23)

| | | | | | | | | | | age > 38

| | | | | | | | | | | | age <= 44: >50K (2.0)

| | | | | | | | | | | | age > 44: <=50K (3.0/1.0)

| | | | | | | | | | race = Other: <=50K (2.23/1.0)

| | | | | | | | | | race = Black

| | | | | | | | | | | age <= 38: <=50K (6.45/1.0)

| | | | | | | | | | | age > 38: >50K (26.68/8.23)

| | | | | | | | | occupation = Other-service: <=50K (144.99/32.06)

| | | | | | | | | occupation = Sales

| | | | | | | | | | workclass = Private

| | | | | | | | | | | fnlwgt <= 89259: <=50K (67.76/17.19)

| | | | | | | | | | | fnlwgt > 89259

| | | | | | | | | | | | age <= 40: <=50K (119.89/49.47)

| | | | | | | | | | | | age > 40: >50K (147.25/56.46)

| | | | | | | | | | workclass = Self-emp-not-inc

| | | | | | | | | | | education = Bachelors: <=50K (0.0)

| | | | | | | | | | | education = Some-college

| | | | | | | | | | | | fnlwgt <= 345734: <=50K (52.01/13.27)

| | | | | | | | | | | | fnlwgt > 345734: >50K (7.08/0.02)

| | | | | | | | | | | education = 11th: <=50K (0.0)

| | | | | | | | | | | education = HS-grad: <=50K (0.0)

| | | | | | | | | | | education = Prof-school: <=50K (0.0)

| | | | | | | | | | | education = Assoc-acdm: <=50K (0.0)

| | | | | | | | | | | education = Assoc-voc

| | | | | | | | | | | | age <= 46: <=50K (5.11/1.08)

| | | | | | | | | | | | age > 46: >50K (3.19/0.1)

| | | | | | | | | | | education = 9th: <=50K (0.0)

| | | | | | | | | | | education = 7th-8th: <=50K (0.0)

| | | | | | | | | | | education = 12th: <=50K (0.0)

| | | | | | | | | | | education = Masters: <=50K (0.0)

| | | | | | | | | | | education = 1st-4th: <=50K (0.0)

| | | | | | | | | | | education = 10th: <=50K (0.0)

| | | | | | | | | | | education = Doctorate: <=50K (0.0)

| | | | | | | | | | | education = 5th-6th: <=50K (0.0)

| | | | | | | | | | | education = Preschool: <=50K (0.0)

| | | | | | | | | | workclass = Self-emp-inc

| | | | | | | | | | | hours-per-week <= 42

| | | | | | | | | | | | hours-per-week <= 39: >50K (4.1/1.05)

| | | | | | | | | | | | hours-per-week > 39: <=50K (11.69/2.16)

| | | | | | | | | | | hours-per-week > 42: >50K (42.41/12.2)

| | | | | | | | | | workclass = Federal-gov: <=50K (0.0)

| | | | | | | | | | workclass = Local-gov: <=50K (1.02/0.01)

| | | | | | | | | | workclass = State-gov: <=50K (2.04/1.01)

| | | | | | | | | | workclass = Without-pay: <=50K (0.0)

| | | | | | | | | | workclass = Never-worked: <=50K (0.0)

| | | | | | | | | occupation = Exec-managerial

| | | | | | | | | | workclass = Private

| | | | | | | | | | | relationship = Wife

| | | | | | | | | | | | hours-per-week <= 49: >50K (31.17/4.68)

| | | | | | | | | | | | hours-per-week > 49

| | | | | | | | | | | | | fnlwgt <= 107897: >50K (4.0/1.0)

| | | | | | | | | | | | | fnlwgt > 107897: <=50K (6.29/0.1)

| | | | | | | | | | | relationship = Own-child: <=50K (3.1/1.0)

| | | | | | | | | | | relationship = Husband: >50K (299.57/117.61)

| | | | | | | | | | | relationship = Not-in-family: >50K (0.0)

| | | | | | | | | | | relationship = Other-relative: >50K (2.0/1.0)

| | | | | | | | | | | relationship = Unmarried: >50K (0.0)

| | | | | | | | | | workclass = Self-emp-not-inc: <=50K (68.41/21.5)

| | | | | | | | | | workclass = Self-emp-inc: >50K (91.89/32.22)

| | | | | | | | | | workclass = Federal-gov: >50K (25.53/6.34)

| | | | | | | | | | workclass = Local-gov

| | | | | | | | | | | race = White

| | | | | | | | | | | | education = Bachelors: <=50K (0.0)

| | | | | | | | | | | | education = Some-college: <=50K (26.55/12.15)

| | | | | | | | | | | | education = 11th: <=50K (0.0)

| | | | | | | | | | | | education = HS-grad: <=50K (0.0)

| | | | | | | | | | | | education = Prof-school: <=50K (0.0)

| | | | | | | | | | | | education = Assoc-acdm: <=50K (0.0)

| | | | | | | | | | | | education = Assoc-voc

| | | | | | | | | | | | | fnlwgt <= 234428: >50K (7.12/2.06)

| | | | | | | | | | | | | fnlwgt > 234428: <=50K (2.05/0.03)

| | | | | | | | | | | | education = 9th: <=50K (0.0)

| | | | | | | | | | | | education = 7th-8th: <=50K (0.0)

| | | | | | | | | | | | education = 12th: <=50K (0.0)

| | | | | | | | | | | | education = Masters: <=50K (0.0)

| | | | | | | | | | | | education = 1st-4th: <=50K (0.0)

| | | | | | | | | | | | education = 10th: <=50K (0.0)

| | | | | | | | | | | | education = Doctorate: <=50K (0.0)

| | | | | | | | | | | | education = 5th-6th: <=50K (0.0)

| | | | | | | | | | | | education = Preschool: <=50K (0.0)

| | | | | | | | | | | race = Asian-Pac-Islander: >50K (0.05/0.01)

| | | | | | | | | | | race = Amer-Indian-Eskimo: >50K (3.01/1.01)

| | | | | | | | | | | race = Other: <=50K (0.01)

| | | | | | | | | | | race = Black: >50K (2.06/0.03)

| | | | | | | | | | workclass = State-gov

| | | | | | | | | | | relationship = Wife: >50K (3.1/1.06)

| | | | | | | | | | | relationship = Own-child: <=50K (0.01)

| | | | | | | | | | | relationship = Husband

| | | | | | | | | | | | age <= 45: <=50K (9.11/1.03)

| | | | | | | | | | | | age > 45: >50K (11.27/3.17)

| | | | | | | | | | | relationship = Not-in-family: <=50K (0.0)

| | | | | | | | | | | relationship = Other-relative: <=50K (0.0)

| | | | | | | | | | | relationship = Unmarried: <=50K (0.0)

| | | | | | | | | | workclass = Without-pay: >50K (0.0)

| | | | | | | | | | workclass = Never-worked: >50K (0.0)

| | | | | | | | | occupation = Prof-specialty

| | | | | | | | | | relationship = Wife

| | | | | | | | | | | capital-gain <= 3471: >50K (37.09/9.66)

| | | | | | | | | | | capital-gain > 3471: <=50K (2.0)

| | | | | | | | | | relationship = Own-child: <=50K (0.07)

| | | | | | | | | | relationship = Husband

| | | | | | | | | | | workclass = Private

| | | | | | | | | | | | hours-per-week <= 51: >50K (148.67/64.87)

| | | | | | | | | | | | hours-per-week > 51: <=50K (11.37/3.27)

| | | | | | | | | | | workclass = Self-emp-not-inc: <=50K (19.37/6.13)

| | | | | | | | | | | workclass = Self-emp-inc: <=50K (4.08/2.03)

| | | | | | | | | | | workclass = Federal-gov: >50K (12.23/3.15)

| | | | | | | | | | | workclass = Local-gov

| | | | | | | | | | | | hours-per-week <= 42: >50K (6.1/2.07)

| | | | | | | | | | | | hours-per-week > 42: <=50K (2.06/0.03)

| | | | | | | | | | | workclass = State-gov: >50K (14.27/5.18)

| | | | | | | | | | | workclass = Without-pay: >50K (0.0)

| | | | | | | | | | | workclass = Never-worked: >50K (0.0)

| | | | | | | | | | relationship = Not-in-family: >50K (0.0)

| | | | | | | | | | relationship = Other-relative: <=50K (1.0)

| | | | | | | | | | relationship = Unmarried: >50K (0.0)

| | | | | | | | | occupation = Handlers-cleaners: <=50K (92.91/18.68)

| | | | | | | | | occupation = Machine-op-inspct: <=50K (197.06/64.45)

| | | | | | | | | occupation = Adm-clerical

| | | | | | | | | | race = White

| | | | | | | | | | | workclass = Private

| | | | | | | | | | | | education = Bachelors: <=50K (0.0)

| | | | | | | | | | | | education = Some-college: <=50K (137.77/53.75)

| | | | | | | | | | | | education = 11th: <=50K (0.0)

| | | | | | | | | | | | education = HS-grad: <=50K (0.0)

| | | | | | | | | | | | education = Prof-school: <=50K (0.0)

| | | | | | | | | | | | education = Assoc-acdm: <=50K (0.0)

| | | | | | | | | | | | education = Assoc-voc

| | | | | | | | | | | | | fnlwgt <= 143312

| | | | | | | | | | | | | | hours-per-week <= 42

| | | | | | | | | | | | | | | fnlwgt <= 110213: <=50K (4.12/0.06)

| | | | | | | | | | | | | | | fnlwgt > 110213: >50K (3.12/0.06)

| | | | | | | | | | | | | | hours-per-week > 42: >50K (4.17/1.06)

| | | | | | | | | | | | | fnlwgt > 143312: <=50K (23.4/3.23)

| | | | | | | | | | | | education = 9th: <=50K (0.0)

| | | | | | | | | | | | education = 7th-8th: <=50K (0.0)

| | | | | | | | | | | | education = 12th: <=50K (0.0)

| | | | | | | | | | | | education = Masters: <=50K (0.0)

| | | | | | | | | | | | education = 1st-4th: <=50K (0.0)

| | | | | | | | | | | | education = 10th: <=50K (0.0)

| | | | | | | | | | | | education = Doctorate: <=50K (0.0)

| | | | | | | | | | | | education = 5th-6th: <=50K (0.0)

| | | | | | | | | | | | education = Preschool: <=50K (0.0)

| | | | | | | | | | | workclass = Self-emp-not-inc: >50K (4.08/1.06)

| | | | | | | | | | | workclass = Self-emp-inc: >50K (1.02/0.01)

| | | | | | | | | | | workclass = Federal-gov: >50K (45.95/16.63)

| | | | | | | | | | | workclass = Local-gov

| | | | | | | | | | | | sex = Female: <=50K (10.07/3.03)

| | | | | | | | | | | | sex = Male: >50K (8.31/2.21)

| | | | | | | | | | | workclass = State-gov: <=50K (11.23/4.08)

| | | | | | | | | | | workclass = Without-pay: <=50K (0.0)

| | | | | | | | | | | workclass = Never-worked: <=50K (0.0)

| | | | | | | | | | race = Asian-Pac-Islander: >50K (8.34/2.08)

| | | | | | | | | | race = Amer-Indian-Eskimo: <=50K (4.08/2.0)

| | | | | | | | | | race = Other: <=50K (0.08)

| | | | | | | | | | race = Black

| | | | | | | | | | | workclass = Private

| | | | | | | | | | | | hours-per-week <= 42

| | | | | | | | | | | | | fnlwgt <= 285200: <=50K (13.3/4.12)

| | | | | | | | | | | | | fnlwgt > 285200: >50K (5.0/1.0)

| | | | | | | | | | | | hours-per-week > 42: >50K (6.0)

| | | | | | | | | | | workclass = Self-emp-not-inc: >50K (0.0)

| | | | | | | | | | | workclass = Self-emp-inc: >50K (0.0)

| | | | | | | | | | | workclass = Federal-gov: >50K (5.06/1.04)

| | | | | | | | | | | workclass = Local-gov: <=50K (3.04/1.01)

| | | | | | | | | | | workclass = State-gov: <=50K (2.02/0.01)

| | | | | | | | | | | workclass = Without-pay: >50K (0.0)

| | | | | | | | | | | workclass = Never-worked: >50K (0.0)

| | | | | | | | | occupation = Farming-fishing: <=50K (146.01/30.07)

| | | | | | | | | occupation = Transport-moving

| | | | | | | | | | workclass = Private: <=50K (158.26/60.16)

| | | | | | | | | | workclass = Self-emp-not-inc

| | | | | | | | | | | education = Bachelors: <=50K (0.0)

| | | | | | | | | | | education = Some-college: <=50K (11.21/2.06)

| | | | | | | | | | | education = 11th: <=50K (0.0)

| | | | | | | | | | | education = HS-grad: <=50K (0.0)

| | | | | | | | | | | education = Prof-school: <=50K (0.0)

| | | | | | | | | | | education = Assoc-acdm: <=50K (0.0)

| | | | | | | | | | | education = Assoc-voc: >50K (2.06/0.03)

| | | | | | | | | | | education = 9th: <=50K (0.0)

| | | | | | | | | | | education = 7th-8th: <=50K (0.0)

| | | | | | | | | | | education = 12th: <=50K (0.0)

| | | | | | | | | | | education = Masters: <=50K (0.0)

| | | | | | | | | | | education = 1st-4th: <=50K (0.0)

| | | | | | | | | | | education = 10th: <=50K (0.0)

| | | | | | | | | | | education = Doctorate: <=50K (0.0)

| | | | | | | | | | | education = 5th-6th: <=50K (0.0)

| | | | | | | | | | | education = Preschool: <=50K (0.0)

| | | | | | | | | | workclass = Self-emp-inc: >50K (7.15/1.09)

| | | | | | | | | | workclass = Federal-gov

| | | | | | | | | | | race = White: >50K (2.07/0.05)

| | | | | | | | | | | race = Asian-Pac-Islander: >50K (0.0/0.0)

| | | | | | | | | | | race = Amer-Indian-Eskimo: <=50K (0.0)

| | | | | | | | | | | race = Other: <=50K (0.0)

| | | | | | | | | | | race = Black: <=50K (2.01/0.0)

| | | | | | | | | | workclass = Local-gov: <=50K (14.29/3.1)

| | | | | | | | | | workclass = State-gov: <=50K (4.08/0.03)

| | | | | | | | | | workclass = Without-pay: <=50K (0.0)

| | | | | | | | | | workclass = Never-worked: <=50K (0.0)

| | | | | | | | | occupation = Priv-house-serv: <=50K (0.0)

| | | | | | | | | occupation = Protective-serv

| | | | | | | | | | race = White

| | | | | | | | | | | workclass = Private: <=50K (19.39/2.13)

| | | | | | | | | | | workclass = Self-emp-not-inc: >50K (1.02/0.01)

| | | | | | | | | | | workclass = Self-emp-inc: >50K (1.02/0.01)

| | | | | | | | | | | workclass = Federal-gov

| | | | | | | | | | | | age <= 46: <=50K (2.03/0.01)

| | | | | | | | | | | | age > 46: >50K (2.06/0.03)

| | | | | | | | | | | workclass = Local-gov

| | | | | | | | | | | | education = Bachelors: >50K (0.0)

| | | | | | | | | | | | education = Some-college

| | | | | | | | | | | | | age <= 53

| | | | | | | | | | | | | | age <= 38: <=50K (32.35/13.03)

| | | | | | | | | | | | | | age > 38

| | | | | | | | | | | | | | | hours-per-week <= 36: <=50K (2.0)

| | | | | | | | | | | | | | | hours-per-week > 36

| | | | | | | | | | | | | | | | fnlwgt <= 121253

| | | | | | | | | | | | | | | | | fnlwgt <= 39411: >50K (3.0/1.0)

| | | | | | | | | | | | | | | | | fnlwgt > 39411: <=50K (4.09/0.03)

| | | | | | | | | | | | | | | | fnlwgt > 121253: >50K (27.21/3.15)

| | | | | | | | | | | | | age > 53: <=50K (5.77/0.27)

| | | | | | | | | | | | education = 11th: >50K (0.0)

| | | | | | | | | | | | education = HS-grad: >50K (0.0)

| | | | | | | | | | | | education = Prof-school: >50K (0.0)

| | | | | | | | | | | | education = Assoc-acdm: >50K (0.0)

| | | | | | | | | | | | education = Assoc-voc

| | | | | | | | | | | | | fnlwgt <= 112772: <=50K (2.12/0.06)

| | | | | | | | | | | | | fnlwgt > 112772: >50K (15.29/2.12)

| | | | | | | | | | | | education = 9th: >50K (0.0)

| | | | | | | | | | | | education = 7th-8th: >50K (0.0)

| | | | | | | | | | | | education = 12th: >50K (0.0)

| | | | | | | | | | | | education = Masters: >50K (0.0)

| | | | | | | | | | | | education = 1st-4th: >50K (0.0)

| | | | | | | | | | | | education = 10th: >50K (0.0)

| | | | | | | | | | | | education = Doctorate: >50K (0.0)

| | | | | | | | | | | | education = 5th-6th: >50K (0.0)

| | | | | | | | | | | | education = Preschool: >50K (0.0)

| | | | | | | | | | | workclass = State-gov

| | | | | | | | | | | | age <= 41: <=50K (9.13/0.03)

| | | | | | | | | | | | age > 41: >50K (15.35/6.22)

| | | | | | | | | | | workclass = Without-pay: <=50K (0.0)

| | | | | | | | | | | workclass = Never-worked: <=50K (0.0)

| | | | | | | | | | race = Asian-Pac-Islander: <=50K (2.18/0.14)

| | | | | | | | | | race = Amer-Indian-Eskimo: <=50K (1.05)

| | | | | | | | | | race = Other: >50K (2.05/0.05)

| | | | | | | | | | race = Black

| | | | | | | | | | | fnlwgt <= 154897: <=50K (3.14/0.05)

| | | | | | | | | | | fnlwgt > 154897: >50K (11.09/3.05)

| | | | | | | | | occupation = Armed-Forces: >50K (1.02/0.01)

| | | | | | | | capital-loss > 1510: <=50K (43.0/1.0)

| | | | capital-gain > 5060

| | | | | capital-gain <= 6612: >50K (111.0)

| | | | | capital-gain > 6612: <=50K (5.0)

| | | education-num > 11

| | | | hours-per-week <= 30

| | | | | sex = Female

| | | | | | race = White: >50K (145.0/54.0)

| | | | | | race = Asian-Pac-Islander: >50K (6.0/3.0)

| | | | | | race = Amer-Indian-Eskimo: <=50K (1.0)

| | | | | | race = Other: <=50K (1.0)

| | | | | | race = Black: <=50K (6.0/1.0)

| | | | | sex = Male: <=50K (386.0/111.0)

| | | | hours-per-week > 30

| | | | | age <= 33

| | | | | | age <= 25: <=50K (121.0/28.0)

| | | | | | age > 25

| | | | | | | education-num <= 12: <=50K (129.0/40.0)

| | | | | | | education-num > 12

| | | | | | | | native-country = United-States

| | | | | | | | | relationship = Wife: >50K (109.69/29.9)

| | | | | | | | | relationship = Own-child: <=50K (2.0)

| | | | | | | | | relationship = Husband

| | | | | | | | | | occupation = Tech-support

| | | | | | | | | | | education-num <= 13

| | | | | | | | | | | | hours-per-week <= 46

| | | | | | | | | | | | | fnlwgt <= 142049: >50K (4.0)

| | | | | | | | | | | | | fnlwgt > 142049

| | | | | | | | | | | | | | age <= 28: <=50K (2.0)

| | | | | | | | | | | | | | age > 28

| | | | | | | | | | | | | | | fnlwgt <= 168030: <=50K (2.0)

| | | | | | | | | | | | | | | fnlwgt > 168030: >50K (7.0/2.0)

| | | | | | | | | | | | hours-per-week > 46: <=50K (3.0)

| | | | | | | | | | | education-num > 13: >50K (2.06)

| | | | | | | | | | occupation = Craft-repair

| | | | | | | | | | | hours-per-week <= 42: <=50K (20.0/6.0)

| | | | | | | | | | | hours-per-week > 42: >50K (16.11/7.0)

| | | | | | | | | | occupation = Other-service

| | | | | | | | | | | fnlwgt <= 120676: >50K (2.0)

| | | | | | | | | | | fnlwgt > 120676: <=50K (7.93/1.03)

| | | | | | | | | | occupation = Sales

| | | | | | | | | | | workclass = Private: >50K (89.18/33.9)

| | | | | | | | | | | workclass = Self-emp-not-inc: <=50K (8.82/2.03)

| | | | | | | | | | | workclass = Self-emp-inc

| | | | | | | | | | | | age <= 30: >50K (4.03)

| | | | | | | | | | | | age > 30: <=50K (6.0/2.0)

| | | | | | | | | | | workclass = Federal-gov: >50K (0.0)

| | | | | | | | | | | workclass = Local-gov: <=50K (1.0/0.0)

| | | | | | | | | | | workclass = State-gov: >50K (0.0)

| | | | | | | | | | | workclass = Without-pay: >50K (0.0)

| | | | | | | | | | | workclass = Never-worked: >50K (0.0)

| | | | | | | | | | occupation = Exec-managerial

| | | | | | | | | | | education = Bachelors

| | | | | | | | | | | | age <= 29

| | | | | | | | | | | | | race = White: <=50K (49.0/22.0)

| | | | | | | | | | | | | race = Asian-Pac-Islander: <=50K (0.0)

| | | | | | | | | | | | | race = Amer-Indian-Eskimo: <=50K (0.0)

| | | | | | | | | | | | | race = Other: <=50K (0.0)

| | | | | | | | | | | | | race = Black: >50K (3.0)

| | | | | | | | | | | | age > 29: >50K (84.69/22.79)

| | | | | | | | | | | education = Some-college: >50K (0.0)

| | | | | | | | | | | education = 11th: >50K (0.0)

| | | | | | | | | | | education = HS-grad: >50K (0.0)

| | | | | | | | | | | education = Prof-school: >50K (0.0)

| | | | | | | | | | | education = Assoc-acdm: >50K (0.0)

| | | | | | | | | | | education = Assoc-voc: >50K (0.0)

| | | | | | | | | | | education = 9th: >50K (0.0)

| | | | | | | | | | | education = 7th-8th: >50K (0.0)

| | | | | | | | | | | education = 12th: >50K (0.0)

| | | | | | | | | | | education = Masters: >50K (17.24/2.0)

| | | | | | | | | | | education = 1st-4th: >50K (0.0)

| | | | | | | | | | | education = 10th: >50K (0.0)

| | | | | | | | | | | education = Doctorate: <=50K (1.24/0.24)

| | | | | | | | | | | education = 5th-6th: >50K (0.0)

| | | | | | | | | | | education = Preschool: >50K (0.0)

| | | | | | | | | | occupation = Prof-specialty

| | | | | | | | | | | workclass = Private

| | | | | | | | | | | | age <= 28

| | | | | | | | | | | | | education = Bachelors

| | | | | | | | | | | | | | hours-per-week <= 56: <=50K (20.79/6.0)

| | | | | | | | | | | | | | hours-per-week > 56: >50K (2.0)

| | | | | | | | | | | | | education = Some-college: <=50K (0.0)

| | | | | | | | | | | | | education = 11th: <=50K (0.0)

| | | | | | | | | | | | | education = HS-grad: <=50K (0.0)

| | | | | | | | | | | | | education = Prof-school

| | | | | | | | | | | | | | hours-per-week <= 55: >50K (2.0)

| | | | | | | | | | | | | | hours-per-week > 55: <=50K (2.0)

| | | | | | | | | | | | | education = Assoc-acdm: <=50K (0.0)

| | | | | | | | | | | | | education = Assoc-voc: <=50K (0.0)

| | | | | | | | | | | | | education = 9th: <=50K (0.0)

| | | | | | | | | | | | | education = 7th-8th: <=50K (0.0)

| | | | | | | | | | | | | education = 12th: <=50K (0.0)

| | | | | | | | | | | | | education = Masters

| | | | | | | | | | | | | | hours-per-week <= 46: >50K (4.0/1.0)

| | | | | | | | | | | | | | hours-per-week > 46: <=50K (3.0)

| | | | | | | | | | | | | education = 1st-4th: <=50K (0.0)

| | | | | | | | | | | | | education = 10th: <=50K (0.0)

| | | | | | | | | | | | | education = Doctorate: >50K (2.0/1.0)

| | | | | | | | | | | | | education = 5th-6th: <=50K (0.0)

| | | | | | | | | | | | | education = Preschool: <=50K (0.0)

| | | | | | | | | | | | age > 28: >50K (117.38/38.0)

| | | | | | | | | | | workclass = Self-emp-not-inc: >50K (11.03/2.0)

| | | | | | | | | | | workclass = Self-emp-inc: >50K (5.02/1.0)

| | | | | | | | | | | workclass = Federal-gov: >50K (11.93/4.0)

| | | | | | | | | | | workclass = Local-gov: <=50K (35.11/13.11)

| | | | | | | | | | | workclass = State-gov

| | | | | | | | | | | | education = Bachelors: >50K (7.0/2.0)

| | | | | | | | | | | | education = Some-college: >50K (0.0)

| | | | | | | | | | | | education = 11th: >50K (0.0)

| | | | | | | | | | | | education = HS-grad: >50K (0.0)

| | | | | | | | | | | | education = Prof-school: >50K (2.0/1.0)

| | | | | | | | | | | | education = Assoc-acdm: >50K (0.0)

| | | | | | | | | | | | education = Assoc-voc: >50K (0.0)

| | | | | | | | | | | | education = 9th: >50K (0.0)

| | | | | | | | | | | | education = 7th-8th: >50K (0.0)

| | | | | | | | | | | | education = 12th: >50K (0.0)

| | | | | | | | | | | | education = Masters

| | | | | | | | | | | | | fnlwgt <= 192740: <=50K (3.92/0.03)

| | | | | | | | | | | | | fnlwgt > 192740: >50K (3.0/1.0)

| | | | | | | | | | | | education = 1st-4th: >50K (0.0)

| | | | | | | | | | | | education = 10th: >50K (0.0)

| | | | | | | | | | | | education = Doctorate: >50K (1.92/0.9)

| | | | | | | | | | | | education = 5th-6th: >50K (0.0)

| | | | | | | | | | | | education = Preschool: >50K (0.0)

| | | | | | | | | | | workclass = Without-pay: >50K (0.0)

| | | | | | | | | | | workclass = Never-worked: >50K (0.0)

| | | | | | | | | | occupation = Handlers-cleaners

| | | | | | | | | | | hours-per-week <= 43: <=50K (3.0)

| | | | | | | | | | | hours-per-week > 43: >50K (2.91)

| | | | | | | | | | occupation = Machine-op-inspct: <=50K (5.91/1.02)

| | | | | | | | | | occupation = Adm-clerical

| | | | | | | | | | | age <= 31

| | | | | | | | | | | | age <= 29: <=50K (8.94/1.94)

| | | | | | | | | | | | age > 29: >50K (9.04/2.0)

| | | | | | | | | | | age > 31: <=50K (8.0/3.0)

| | | | | | | | | | occupation = Farming-fishing: <=50K (8.03/1.03)

| | | | | | | | | | occupation = Transport-moving: >50K (2.01/1.0)

| | | | | | | | | | occupation = Priv-house-serv: >50K (0.0)

| | | | | | | | | | occupation = Protective-serv

| | | | | | | | | | | hours-per-week <= 69

| | | | | | | | | | | | race = White

| | | | | | | | | | | | | fnlwgt <= 225339: <=50K (10.07/2.07)

| | | | | | | | | | | | | fnlwgt > 225339: >50K (4.0)

| | | | | | | | | | | | race = Asian-Pac-Islander: <=50K (0.0)

| | | | | | | | | | | | race = Amer-Indian-Eskimo: <=50K (0.0)

| | | | | | | | | | | | race = Other: <=50K (0.0)

| | | | | | | | | | | | race = Black: >50K (4.0/2.0)

| | | | | | | | | | | hours-per-week > 69: >50K (4.0)

| | | | | | | | | | occupation = Armed-Forces: >50K (0.0)

| | | | | | | | | relationship = Not-in-family: >50K (0.0)

| | | | | | | | | relationship = Other-relative: <=50K (6.0/1.0)

| | | | | | | | | relationship = Unmarried: >50K (0.0)

| | | | | | | | native-country = Cambodia: <=50K (1.02/0.01)

| | | | | | | | native-country = England

| | | | | | | | | age <= 32: >50K (2.1/0.06)

| | | | | | | | | age > 32: <=50K (3.01)

| | | | | | | | native-country = Puerto-Rico: <=50K (1.02/0.01)

| | | | | | | | native-country = Canada: <=50K (4.09/1.03)

| | | | | | | | native-country = Germany: <=50K (4.09/1.03)

| | | | | | | | native-country = Outlying-US(Guam-USVI-etc): >50K (0.0)

| | | | | | | | native-country = India

| | | | | | | | | workclass = Private: <=50K (10.16/2.07)

| | | | | | | | | workclass = Self-emp-not-inc: <=50K (0.06/0.01)

| | | | | | | | | workclass = Self-emp-inc: <=50K (0.0)

| | | | | | | | | workclass = Federal-gov: >50K (0.01)

| | | | | | | | | workclass = Local-gov: <=50K (0.01/0.0)

| | | | | | | | | workclass = State-gov: >50K (2.03/0.03)

| | | | | | | | | workclass = Without-pay: <=50K (0.0)

| | | | | | | | | workclass = Never-worked: <=50K (0.0)

| | | | | | | | native-country = Japan: <=50K (6.14/1.05)

| | | | | | | | native-country = Greece: >50K (1.02/0.01)

| | | | | | | | native-country = South: <=50K (1.02/0.01)

| | | | | | | | native-country = China

| | | | | | | | | fnlwgt <= 315203: <=50K (2.09/0.03)

| | | | | | | | | fnlwgt > 315203: >50K (2.0/0.0)

| | | | | | | | native-country = Cuba: >50K (3.07/1.04)

| | | | | | | | native-country = Iran: >50K (2.05/0.03)

| | | | | | | | native-country = Honduras: >50K (1.02/0.01)

| | | | | | | | native-country = Philippines: <=50K (6.14/3.05)

| | | | | | | | native-country = Italy: <=50K (1.02/0.01)

| | | | | | | | native-country = Poland: >50K (0.0)

| | | | | | | | native-country = Jamaica: <=50K (1.02/0.01)

| | | | | | | | native-country = Vietnam: >50K (1.02/0.01)

| | | | | | | | native-country = Mexico: <=50K (8.19/1.07)

| | | | | | | | native-country = Portugal: >50K (0.0)

| | | | | | | | native-country = Ireland: >50K (0.0)

| | | | | | | | native-country = France: >50K (3.07/0.04)

| | | | | | | | native-country = Dominican-Republic: <=50K (2.05/1.02)

| | | | | | | | native-country = Laos: >50K (0.0)

| | | | | | | | native-country = Ecuador: <=50K (2.05/0.02)

| | | | | | | | native-country = Taiwan: <=50K (3.07/1.03)

| | | | | | | | native-country = Haiti: <=50K (1.02/0.01)

| | | | | | | | native-country = Columbia: <=50K (3.07/1.03)

| | | | | | | | native-country = Hungary: >50K (0.0)

| | | | | | | | native-country = Guatemala: >50K (0.0)

| | | | | | | | native-country = Nicaragua: <=50K (1.02/0.01)

| | | | | | | | native-country = Scotland: >50K (0.0)

| | | | | | | | native-country = Thailand: >50K (1.02/0.01)

| | | | | | | | native-country = Yugoslavia: <=50K (2.05/1.02)

| | | | | | | | native-country = El-Salvador: <=50K (1.02/0.01)

| | | | | | | | native-country = Trinadad&Tobago: >50K (0.0)

| | | | | | | | native-country = Peru: >50K (0.0)

| | | | | | | | native-country = Hong

| | | | | | | | | age <= 29: >50K (2.05/0.02)

| | | | | | | | | age > 29: <=50K (3.07/1.01)

| | | | | | | | native-country = Holand-Netherlands: >50K (0.0)

| | | | | age > 33

| | | | | | occupation = Tech-support: >50K (128.28/38.19)

| | | | | | occupation = Craft-repair

| | | | | | | education = Bachelors

| | | | | | | | workclass = Private: >50K (90.34/37.74)

| | | | | | | | workclass = Self-emp-not-inc: <=50K (24.36/12.16)

| | | | | | | | workclass = Self-emp-inc: <=50K (10.15/3.07)

| | | | | | | | workclass = Federal-gov: >50K (3.05/1.02)

| | | | | | | | workclass = Local-gov

| | | | | | | | | hours-per-week <= 44: <=50K (8.11/1.03)

| | | | | | | | | hours-per-week > 44: >50K (3.06/0.02)

| | | | | | | | workclass = State-gov: >50K (3.05/1.02)

| | | | | | | | workclass = Without-pay: >50K (0.0)

| | | | | | | | workclass = Never-worked: >50K (0.0)

| | | | | | | education = Some-college: >50K (0.0)

| | | | | | | education = 11th: >50K (0.0)

| | | | | | | education = HS-grad: >50K (0.0)

| | | | | | | education = Prof-school: <=50K (5.39/2.22)

| | | | | | | education = Assoc-acdm

| | | | | | | | age <= 37: <=50K (15.06/3.0)

| | | | | | | | age > 37

| | | | | | | | | fnlwgt <= 153052: <=50K (18.11/5.06)

| | | | | | | | | fnlwgt > 153052: >50K (26.06/5.06)

| | | | | | | education = Assoc-voc: >50K (0.0)

| | | | | | | education = 9th: >50K (0.0)

| | | | | | | education = 7th-8th: >50K (0.0)

| | | | | | | education = 12th: >50K (0.0)

| | | | | | | education = Masters: >50K (20.11/8.5)

| | | | | | | education = 1st-4th: >50K (0.0)

| | | | | | | education = 10th: >50K (0.0)

| | | | | | | education = Doctorate: <=50K (1.22/0.11)

| | | | | | | education = 5th-6th: >50K (0.0)

| | | | | | | education = Preschool: >50K (0.0)

| | | | | | occupation = Other-service: <=50K (57.01/10.49)

| | | | | | occupation = Sales

| | | | | | | relationship = Wife: <=50K (18.92/7.4)

| | | | | | | relationship = Own-child: >50K (2.0)

| | | | | | | relationship = Husband: >50K (519.69/175.48)

| | | | | | | relationship = Not-in-family: >50K (0.0)

| | | | | | | relationship = Other-relative: <=50K (1.0)

| | | | | | | relationship = Unmarried: >50K (0.0)

| | | | | | occupation = Exec-managerial

| | | | | | | age <= 62: >50K (1132.64/264.89)

| | | | | | | age > 62

| | | | | | | | workclass = Private

| | | | | | | | | hours-per-week <= 46

| | | | | | | | | | hours-per-week <= 42: >50K (14.21/4.56)

| | | | | | | | | | hours-per-week > 42: <=50K (2.13)

| | | | | | | | | hours-per-week > 46: >50K (5.52/1.13)

| | | | | | | | workclass = Self-emp-not-inc: <=50K (6.9/0.33)

| | | | | | | | workclass = Self-emp-inc

| | | | | | | | | education-num <= 13: <=50K (10.15/4.33)

| | | | | | | | | education-num > 13: >50K (3.66/0.33)

| | | | | | | | workclass = Federal-gov: >50K (1.15/0.1)

| | | | | | | | workclass = Local-gov: <=50K (2.3/0.11)

| | | | | | | | workclass = State-gov: <=50K (2.3/0.11)

| | | | | | | | workclass = Without-pay: <=50K (0.0)

| | | | | | | | workclass = Never-worked: <=50K (0.0)

| | | | | | occupation = Prof-specialty

| | | | | | | education-num <= 14

| | | | | | | | hours-per-week <= 53

| | | | | | | | | capital-gain <= 1506: >50K (853.23/231.2)

| | | | | | | | | capital-gain > 1506

| | | | | | | | | | capital-gain <= 4687: >50K (19.7/3.35)

| | | | | | | | | | capital-gain > 4687

| | | | | | | | | | | capital-gain <= 5060: <=50K (7.0)

| | | | | | | | | | | capital-gain > 5060: >50K (10.35)

| | | | | | | | hours-per-week > 53

| | | | | | | | | education = Bachelors

| | | | | | | | | | relationship = Wife: <=50K (6.35/1.35)

| | | | | | | | | | relationship = Own-child: >50K (0.0)

| | | | | | | | | | relationship = Husband: >50K (85.11/29.7)

| | | | | | | | | | relationship = Not-in-family: <=50K (1.0)

| | | | | | | | | | relationship = Other-relative: >50K (0.0)

| | | | | | | | | | relationship = Unmarried: >50K (0.0)

| | | | | | | | | education = Some-college: >50K (0.0)

| | | | | | | | | education = 11th: >50K (0.0)

| | | | | | | | | education = HS-grad: >50K (0.0)

| | | | | | | | | education = Prof-school: >50K (0.0)

| | | | | | | | | education = Assoc-acdm: <=50K (7.35/1.0)

| | | | | | | | | education = Assoc-voc: >50K (0.0)

| | | | | | | | | education = 9th: >50K (0.0)

| | | | | | | | | education = 7th-8th: >50K (0.0)

| | | | | | | | | education = 12th: >50K (0.0)

| | | | | | | | | education = Masters

| | | | | | | | | | workclass = Private

| | | | | | | | | | | hours-per-week <= 65

| | | | | | | | | | | | age <= 38: >50K (5.0/1.0)

| | | | | | | | | | | | age > 38: <=50K (20.3/8.3)

| | | | | | | | | | | hours-per-week > 65: <=50K (2.0)

| | | | | | | | | | workclass = Self-emp-not-inc

| | | | | | | | | | | fnlwgt <= 194924: >50K (2.02)

| | | | | | | | | | | fnlwgt > 194924: <=50K (2.02/0.02)

| | | | | | | | | | workclass = Self-emp-inc: >50K (3.03/1.0)

| | | | | | | | | | workclass = Federal-gov: >50K (0.0)

| | | | | | | | | | workclass = Local-gov: >50K (19.21/6.0)

| | | | | | | | | | workclass = State-gov

| | | | | | | | | | | age <= 40: <=50K (4.06/1.06)

| | | | | | | | | | | age > 40: >50K (7.06)

| | | | | | | | | | workclass = Without-pay: >50K (0.0)

| | | | | | | | | | workclass = Never-worked: >50K (0.0)

| | | | | | | | | education = 1st-4th: >50K (0.0)

| | | | | | | | | education = 10th: >50K (0.0)

| | | | | | | | | education = Doctorate: >50K (0.0)

| | | | | | | | | education = 5th-6th: >50K (0.0)

| | | | | | | | | education = Preschool: >50K (0.0)

| | | | | | | education-num > 14: >50K (391.87/62.76)

| | | | | | occupation = Handlers-cleaners: <=50K (31.56/10.27)

| | | | | | occupation = Machine-op-inspct: <=50K (51.92/22.44)

| | | | | | occupation = Adm-clerical

| | | | | | | race = White

| | | | | | | | relationship = Wife

| | | | | | | | | age <= 57: >50K (32.18/7.0)

| | | | | | | | | age > 57: <=50K (3.12)

| | | | | | | | relationship = Own-child: <=50K (1.0)

| | | | | | | | relationship = Husband

| | | | | | | | | age <= 58

| | | | | | | | | | age <= 41: <=50K (54.29/22.06)

| | | | | | | | | | age > 41

| | | | | | | | | | | capital-gain <= 3942: >50K (84.11/24.47)

| | | | | | | | | | | capital-gain > 3942

| | | | | | | | | | | | capital-gain <= 5060: <=50K (3.0)

| | | | | | | | | | | | capital-gain > 5060: >50K (2.0)

| | | | | | | | | age > 58: <=50K (14.16/4.99)

| | | | | | | | relationship = Not-in-family: >50K (0.0)

| | | | | | | | relationship = Other-relative: >50K (1.0)

| | | | | | | | relationship = Unmarried: >50K (0.0)

| | | | | | | race = Asian-Pac-Islander: >50K (31.12/15.12)

| | | | | | | race = Amer-Indian-Eskimo: >50K (1.06)

| | | | | | | race = Other: >50K (1.0)

| | | | | | | race = Black: >50K (12.23/3.12)

| | | | | | occupation = Farming-fishing

| | | | | | | workclass = Private: <=50K (20.36/6.17)

| | | | | | | workclass = Self-emp-not-inc: <=50K (41.74/10.36)

| | | | | | | workclass = Self-emp-inc: >50K (6.11/0.06)

| | | | | | | workclass = Federal-gov: <=50K (2.04/1.02)

| | | | | | | workclass = Local-gov: <=50K (0.0)

| | | | | | | workclass = State-gov: >50K (1.02/0.01)

| | | | | | | workclass = Without-pay: <=50K (1.02/0.01)

| | | | | | | workclass = Never-worked: <=50K (0.0)

| | | | | | occupation = Transport-moving: <=50K (54.98/20.47)

| | | | | | occupation = Priv-house-serv: <=50K (2.04/0.02)

| | | | | | occupation = Protective-serv

| | | | | | | age <= 42

| | | | | | | | capital-gain <= 1506

| | | | | | | | | race = White: <=50K (25.15/8.06)

| | | | | | | | | race = Asian-Pac-Islander: >50K (1.0)

| | | | | | | | | race = Amer-Indian-Eskimo: <=50K (0.0)

| | | | | | | | | race = Other: <=50K (0.0)

| | | | | | | | | race = Black

| | | | | | | | | | age <= 39: <=50K (2.0)

| | | | | | | | | | age > 39: >50K (2.0)

| | | | | | | | capital-gain > 1506: >50K (2.02/0.02)

| | | | | | | age > 42: >50K (44.19/7.59)

| | | | | | occupation = Armed-Forces: >50K (1.02/0.01)

| | capital-loss > 1844

| | | capital-loss <= 1980: >50K (857.0/18.0)

| | | capital-loss > 1980

| | | | capital-loss <= 2163: <=50K (104.0)

| | | | capital-loss > 2163

| | | | | capital-loss <= 2415

| | | | | | capital-loss <= 2377

| | | | | | | age <= 64: <=50K (38.0/4.0)

| | | | | | | age > 64: >50K (30.0/3.0)

| | | | | | capital-loss > 2377: >50K (82.0)

| | | | | capital-loss > 2415: <=50K (14.0)

| marital-status = Divorced

| | education-num <= 12: <=50K (5220.0/225.0)

| | education-num > 12

| | | hours-per-week <= 42

| | | | capital-loss <= 1726: <=50K (722.0/87.0)

| | | | capital-loss > 1726

| | | | | capital-loss <= 2415: <=50K (21.0/5.0)

| | | | | capital-loss > 2415: >50K (7.0/1.0)

| | | hours-per-week > 42

| | | | occupation = Tech-support: <=50K (4.07/1.0)

| | | | occupation = Craft-repair: <=50K (12.2/2.0)

| | | | occupation = Other-service: <=50K (13.22/6.0)

| | | | occupation = Sales: <=50K (72.19/25.0)

| | | | occupation = Exec-managerial

| | | | | capital-loss <= 1485

| | | | | | race = White

| | | | | | | education = Bachelors

| | | | | | | | workclass = Private

| | | | | | | | | relationship = Wife: <=50K (0.0)

| | | | | | | | | relationship = Own-child: >50K (2.0/1.0)

| | | | | | | | | relationship = Husband: <=50K (0.0)

| | | | | | | | | relationship = Not-in-family

| | | | | | | | | | sex = Female: >50K (17.67/6.67)

| | | | | | | | | | sex = Male: <=50K (22.45/10.0)

| | | | | | | | | relationship = Other-relative: <=50K (1.0)

| | | | | | | | | relationship = Unmarried

| | | | | | | | | | sex = Female: <=50K (9.0/2.0)

| | | | | | | | | | sex = Male: >50K (5.0/1.0)

| | | | | | | | workclass = Self-emp-not-inc

| | | | | | | | | age <= 33: >50K (2.03/0.03)

| | | | | | | | | age > 33: <=50K (6.13)

| | | | | | | | workclass = Self-emp-inc

| | | | | | | | | hours-per-week <= 57

| | | | | | | | | | sex = Female: <=50K (2.06)

| | | | | | | | | | sex = Male

| | | | | | | | | | | age <= 44: <=50K (2.06)

| | | | | | | | | | | age > 44: >50K (2.0)

| | | | | | | | | hours-per-week > 57: >50K (2.03/0.03)

| | | | | | | | workclass = Federal-gov

| | | | | | | | | hours-per-week <= 52: <=50K (2.06)

| | | | | | | | | hours-per-week > 52: >50K (2.02/0.02)

| | | | | | | | workclass = Local-gov: <=50K (0.0)

| | | | | | | | workclass = State-gov: >50K (1.02/0.02)

| | | | | | | | workclass = Without-pay: <=50K (0.0)

| | | | | | | | workclass = Never-worked: <=50K (0.0)

| | | | | | | education = Some-college: <=50K (0.0)

| | | | | | | education = 11th: <=50K (0.0)

| | | | | | | education = HS-grad: <=50K (0.0)

| | | | | | | education = Prof-school: <=50K (1.31)

| | | | | | | education = Assoc-acdm: <=50K (0.0)

| | | | | | | education = Assoc-voc: <=50K (0.0)

| | | | | | | education = 9th: <=50K (0.0)

| | | | | | | education = 7th-8th: <=50K (0.0)

| | | | | | | education = 12th: <=50K (0.0)

| | | | | | | education = Masters

| | | | | | | | capital-loss <= 0

| | | | | | | | | hours-per-week <= 67: >50K (32.61/11.61)

| | | | | | | | | hours-per-week > 67: <=50K (6.0/1.0)

| | | | | | | | capital-loss > 0: <=50K (3.0)

| | | | | | | education = 1st-4th: <=50K (0.0)

| | | | | | | education = 10th: <=50K (0.0)

| | | | | | | education = Doctorate: >50K (4.0/1.0)

| | | | | | | education = 5th-6th: <=50K (0.0)

| | | | | | | education = Preschool: <=50K (0.0)

| | | | | | race = Asian-Pac-Islander: <=50K (3.0/1.0)

| | | | | | race = Amer-Indian-Eskimo: <=50K (1.0)

| | | | | | race = Other: <=50K (0.0)

| | | | | | race = Black

| | | | | | | fnlwgt <= 171306: >50K (5.0)

| | | | | | | fnlwgt > 171306: <=50K (4.0/1.0)

| | | | | capital-loss > 1485: >50K (10.0)

| | | | occupation = Prof-specialty

| | | | | education-num <= 14: <=50K (159.81/32.0)

| | | | | education-num > 14

| | | | | | capital-gain <= 1086

| | | | | | | relationship = Wife: >50K (0.0)

| | | | | | | relationship = Own-child: >50K (1.0)

| | | | | | | relationship = Husband: >50K (0.0)

| | | | | | | relationship = Not-in-family

| | | | | | | | hours-per-week <= 52

| | | | | | | | | hours-per-week <= 47: >50K (6.0)

| | | | | | | | | hours-per-week > 47: <=50K (7.0/1.0)

| | | | | | | | hours-per-week > 52: >50K (9.0)

| | | | | | | relationship = Other-relative: >50K (0.0)

| | | | | | | relationship = Unmarried

| | | | | | | | sex = Female: <=50K (4.0)

| | | | | | | | sex = Male: >50K (5.0/1.0)

| | | | | | capital-gain > 1086: <=50K (2.4)

| | | | occupation = Handlers-cleaners: <=50K (2.03/1.0)

| | | | occupation = Machine-op-inspct: <=50K (2.03)

| | | | occupation = Adm-clerical: <=50K (13.22/1.0)

| | | | occupation = Farming-fishing: <=50K (4.07)

| | | | occupation = Transport-moving: <=50K (7.12/1.0)

| | | | occupation = Priv-house-serv: <=50K (1.02)

| | | | occupation = Protective-serv

| | | | | race = White: <=50K (6.17/2.0)

| | | | | race = Asian-Pac-Islander: >50K (0.0)

| | | | | race = Amer-Indian-Eskimo: >50K (0.0)

| | | | | race = Other: >50K (0.0)

| | | | | race = Black: >50K (4.0)

| | | | occupation = Armed-Forces: <=50K (0.0)

| marital-status = Never-married

| | education-num <= 12

| | | capital-loss <= 2206: <=50K (12461.0/146.0)

| | | capital-loss > 2206

| | | | capital-loss <= 2377: <=50K (17.0/3.0)

| | | | capital-loss > 2377: >50K (11.0/1.0)

| | education-num > 12

| | | education-num <= 14

| | | | hours-per-week <= 43: <=50K (2266.0/117.0)

| | | | hours-per-week > 43

| | | | | capital-loss <= 1485: <=50K (887.0/155.0)

| | | | | capital-loss > 1485

| | | | | | capital-loss <= 1573: >50K (11.0/2.0)

| | | | | | capital-loss > 1573

| | | | | | | capital-loss <= 2377: <=50K (35.0/3.0)

| | | | | | | capital-loss > 2377: >50K (6.0)

| | | education-num > 14

| | | | age <= 32: <=50K (82.0/9.0)

| | | | age > 32

| | | | | capital-loss <= 1485

| | | | | | hours-per-week <= 26: <=50K (7.0)

| | | | | | hours-per-week > 26

| | | | | | | occupation = Tech-support: >50K (0.0)

| | | | | | | occupation = Craft-repair: >50K (1.02/0.01)

| | | | | | | occupation = Other-service: >50K (2.04/1.02)

| | | | | | | occupation = Sales: <=50K (1.02/0.01)

| | | | | | | occupation = Exec-managerial

| | | | | | | | age <= 36: <=50K (2.13/0.13)

| | | | | | | | age > 36: >50K (12.13/1.13)

| | | | | | | occupation = Prof-specialty

| | | | | | | | age <= 52

| | | | | | | | | workclass = Private

| | | | | | | | | | sex = Female: >50K (10.0/3.0)

| | | | | | | | | | sex = Male

| | | | | | | | | | | hours-per-week <= 43: >50K (10.0/1.0)

| | | | | | | | | | | hours-per-week > 43: <=50K (7.32/1.32)

| | | | | | | | | workclass = Self-emp-not-inc

| | | | | | | | | | sex = Female

| | | | | | | | | | | hours-per-week <= 52: <=50K (3.0)

| | | | | | | | | | | hours-per-week > 52: >50K (2.0)

| | | | | | | | | | sex = Male: >50K (13.21/2.0)

| | | | | | | | | workclass = Self-emp-inc: >50K (2.02/1.0)

| | | | | | | | | workclass = Federal-gov: >50K (5.06/1.0)

| | | | | | | | | workclass = Local-gov

| | | | | | | | | | age <= 46: >50K (3.06/1.0)

| | | | | | | | | | age > 46: <=50K (2.0)

| | | | | | | | | workclass = State-gov: <=50K (11.13/2.13)

| | | | | | | | | workclass = Without-pay: >50K (0.0)

| | | | | | | | | workclass = Never-worked: >50K (0.0)

| | | | | | | | age > 52: <=50K (17.79/3.0)

| | | | | | | occupation = Handlers-cleaners: >50K (0.0)

| | | | | | | occupation = Machine-op-inspct: >50K (1.02/0.01)

| | | | | | | occupation = Adm-clerical: >50K (1.02/0.01)

| | | | | | | occupation = Farming-fishing: <=50K (2.04/0.02)

| | | | | | | occupation = Transport-moving: >50K (0.0)

| | | | | | | occupation = Priv-house-serv: >50K (0.0)

| | | | | | | occupation = Protective-serv: >50K (0.0)

| | | | | | | occupation = Armed-Forces: >50K (0.0)

| | | | | capital-loss > 1485: >50K (16.0/2.0)

| marital-status = Separated

| | education-num <= 12: <=50K (1318.0/36.0)

| | education-num > 12

| | | education = Bachelors: <=50K (129.0/20.0)

| | | education = Some-college: <=50K (0.0)

| | | education = 11th: <=50K (0.0)

| | | education = HS-grad: <=50K (0.0)

| | | education = Prof-school

| | | | race = White: >50K (7.0/1.0)

| | | | race = Asian-Pac-Islander: >50K (0.0)

| | | | race = Amer-Indian-Eskimo: >50K (0.0)

| | | | race = Other: >50K (0.0)

| | | | race = Black: <=50K (2.0)

| | | education = Assoc-acdm: <=50K (0.0)

| | | education = Assoc-voc: <=50K (0.0)

| | | education = 9th: <=50K (0.0)

| | | education = 7th-8th: <=50K (0.0)

| | | education = 12th: <=50K (0.0)

| | | education = Masters

| | | | sex = Female: <=50K (24.0/2.0)

| | | | sex = Male

| | | | | age <= 45: >50K (5.0)

| | | | | age > 45: <=50K (10.0/3.0)

| | | education = 1st-4th: <=50K (0.0)

| | | education = 10th: <=50K (0.0)

| | | education = Doctorate

| | | | fnlwgt <= 192286: <=50K (5.0)

| | | | fnlwgt > 192286: >50K (5.0/1.0)

| | | education = 5th-6th: <=50K (0.0)

| | | education = Preschool: <=50K (0.0)

| marital-status = Widowed

| | capital-loss <= 2205: <=50K (1460.0/82.0)

| | capital-loss > 2205

| | | race = White: >50K (23.0/9.0)

| | | race = Asian-Pac-Islander: >50K (0.0)

| | | race = Amer-Indian-Eskimo: >50K (0.0)

| | | race = Other: >50K (0.0)

| | | race = Black: <=50K (2.0)

| marital-status = Married-spouse-absent: <=50K (613.0/44.0)

| marital-status = Married-AF-spouse: <=50K (35.0/12.0)

capital-gain > 6849

| hours-per-week <= 35

| | age <= 27

| | | capital-gain <= 22040: >50K (3.0)

| | | capital-gain > 22040: <=50K (6.0)

| | age > 27: >50K (165.0/6.0)

| hours-per-week > 35: >50K (1881.0/16.0)

Number of Leaves : 696

Size of the tree : 911

Time taken to build model: 2.58 seconds

=== Evaluation on test split ===

Time taken to test model on test split: 0.01 seconds

=== Summary ===

Correctly Classified Instances 12631 86.2008 %

Incorrectly Classified Instances 2022 13.7992 %

Kappa statistic 0.584

Mean absolute error 0.195

Root mean squared error 0.3197

Relative absolute error 53.7039 %

Root relative squared error 75.3124 %

Total Number of Instances 14653

=== Detailed Accuracy By Class ===

TP Rate FP Rate Precision Recall F-Measure MCC ROC Area PRC Area Class

0.593 0.055 0.769 0.593 0.669 0.592 0.881 0.744 >50K

0.945 0.407 0.883 0.945 0.913 0.592 0.881 0.944 <=50K

Weighted Avg. 0.862 0.324 0.856 0.862 0.855 0.592 0.881 0.897

=== Confusion Matrix ===

a b <-- classified as

2047 1407 | a = >50K

615 10584 | b = <=50K

I chose 70% split due to the following reasons:

* Though 70% doesn’t give the best possible accuracy, it’s still the best split.
* The best possible accuracy is achieved by 87% split. To be more precise by 87.1%. The following is the summary for 87.1% split

=== Summary ===

Correctly Classified Instances 5454 86.5577 %

Incorrectly Classified Instances 847 13.4423 %

Kappa statistic 0.5957

Mean absolute error 0.1957

Root mean squared error 0.3159

Relative absolute error 54.0071 %

Root relative squared error 74.4688 %

Total Number of Instances 6301

* As you can see the accuracy is not much different, its only 0.3% more than the 70% split. Here, the number of instances in the testing data changes significantly. For 70% it was 14653 while here its only 6301, nearly 8000 more testing cases.
* 8000 test cases might seem less, but in a database of 45000 cases, 8000 is a lot. If you remove them, 70% split will give nearly the same, if not better accuracy than the 87.1%
* Any split above 87% reduces the accuracy while the testing cases get reduced by a lot. The following is the summary for 90% split:

=== Summary ===

Correctly Classified Instances 4172 85.4218 %

Incorrectly Classified Instances 712 14.5782 %

Kappa statistic 0.5626

Mean absolute error 0.205

Root mean squared error 0.3269

Relative absolute error 56.3692 %

Root relative squared error 76.6959 %

Total Number of Instances 4884

* As you can see the accuracy is less and this is even less than a 65% split. Furthermore number of cases used for testing is only 10% of the data base provided.
* There is no point in taking time into consideration for this data base as all the splits only differ by a few milliseconds in giving results.
* So, looking at all the points and taking in consideration accuracy and amount of data used for testing, 70% gives the best possible split.