INSTITUTO POLITÉCNICO NACIONAL
ESCUELA SUPERIOR DE CÓMPUTO

MATERIAL EDUCATIVO PARA LA UNIDAD DE APRENDIZAJE DE MINERÍA DE DATOS.

2022-2

Grupo 5CDM1

PRACTICA DE ÁRBOLES DE DECISIÓN

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1. Descripción del conjunto de datos.

Autores del conjunto de datos:
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Enlace de acceso: https://archive.ics.uci.edu/ml/datasets/adult

2. Objetivo de la práctica.

Realizar un árbol de decisión para predecir si una persona gana más de 50K al año.

3. Diccionario de datos.

Construya el diccionario de datos considerando la siguiente estructura.

No	Nombre	Tipo	Dominio
1	age	Numeric	–
2	workclass	String	Private, Self-emp-not-inc, Self-emp-inc, Federal-gov, Local-gov, State-gov, Without-pay, Never-worked.
3	fnlwgt	Numeric	
4	education	String	Bachelors, Some-college, 11th, HS-grad, Prof-school, Assoc-acdm, Assoc-voc, 9th, 7th-8th, 12th, Masters, 1st-4th,

			10th, Doctorate, 5th-6th, Preschool.
5	education-num	Numeric	continuous
6	marital-status	String	Married-civ-spouse, Divorced, Never-married, Separated, Widowed, Married-spouse-absent, Married-AF-spouse.
7	occupation	String	Tech-support, Craft-repair, Other-service, Sales, Exec-managerial, Prof-specialty, Handlers-cleaners, Machine-op-inspct, Adm-clerical, Farming-fishing, Transport-moving, Priv-house-serv, Protective-serv, Armed-Forces.
8	relationship	String	Wife, Own-child, Husband, Not-in-family, Other-relative, Unmarried.
9	race	String	White, Asian-Pac-Islander, Amer-Indian-Eskimo, Other, Black.
10	sex	String	Female, Male.
11	capital-gain	Numeric	continuous
12	capital-loss	Numeric	continuous
13	hours-per-week	Numeric	continuous
14	native-country	String	United-States, Cambodia, England, Puerto-Rico, Canada, Germany, Outlying-US(Guam-USVI-etc), India, Japan, Greece, South, China, Cuba, Iran, Honduras, Philippines, Italy, Poland, Jamaica, Vietnam, Mexico, Portugal, Ireland, France, Dominican-Republic, Laos, Ecuador, Taiwan, Haiti, Columbia, Hungary, Guatemala, Nicaragua, Scotland, Thailand, Yugoslavia, El-Salvador, Trinadad&Tobago, Peru,

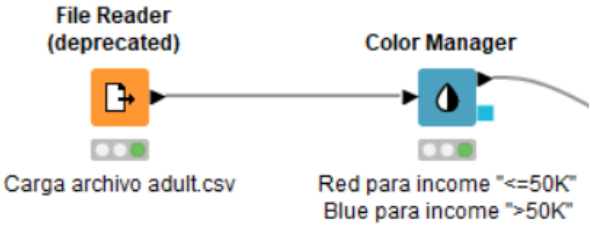
			Hong, Holand-Netherlands.

4. Resultados

Presente los resultados considerando lo siguiente:

1. Realice y describa los resultados de cinco consultas descriptivas en el conjunto de datos
2. Presente propiedades estadísticas del conjunto de datos
3. Describa las medidas generadas a partir de la matriz de confusión (archivo anexo)
4. Analice este comportamiento en función la cantidad de elementos de cada tipo que existen en el conjunto de datos
5. Anexe el modelo y las reglas generadas.

Use los siguientes nodos:



1. **Realice y describa los resultados de cinco consultas descriptivas en el conjunto de datos**

1.- Nivel Educativo por Sexo

RowID	sex	Unique concatenate with count(education)
Row0	Female	Bachelors(1619), Masters(536), 9th(144), HS-grad(3390), Some-college(2806), Prof-school(92), 11th(432), Doctorate(86), Assoc-acdm(421), 10th(295), Assoc-voc(500), 1st-4th(46), Preschool(16), 5th-6th(84), 7th-8th(160), 12th(144)
Row1	Male	Bachelors(3736), HS-grad(7111), 11th(743), Some-college(4485), Assoc-acdm(646), Assoc-voc(882), 7th-8th(486), Doctorate(327), 9th(370), 5th-6th(249), 10th(638), Masters(1187), Prof-school(484), 1st-4th(122), 12th(289), Preschool(35)

(porcentaje por sexo, tratamiento de datos: separar y agrupar niveles educativos)

2.- Raza-nivel educativo

RowID	race	Unique concatenate with count(education)
Row0	Amer-Indian-Eskimo	7th-8th(9), Some-college(79), 10th(16), HS-grad(119), Assoc-acdm(8), 11th(14), Bachelors(21), Assoc-voc(19), Prof-school(2), 9th(5), Masters(5), 5th-6th(2), 12th(5), Doctorate(3), 1st-4th(4)
Row1	Asian-Pac-Islander	Bachelors(289), Assoc-voc(38), Some-college(208), HS-grad(226), Masters(88), Doctorate(28), 11th(21), Assoc-acdm(29), Prof-school(41), 7th-8th(11), 9th(9), 12th(9), 5th-6th(18), 1st-4th(5), 10th(13), Preschool(6)
Row2	Black	11th(153), Bachelors(330), 9th(89), Some-college(746), Assoc-acdm(107), HS-grad(1174), Assoc-voc(112), 10th(133), 12th(70), 5th-6th(21), 1st-4th(16), 7th-8th(56), Masters(86), Prof-school(15), Doctorate(11), Preschool(5)
Row3	Other	Some-college(51), 11th(10), 7th-8th(17), Bachelors(33), HS-grad(78), 10th(9), Assoc-voc(6), 9th(8), Masters(7), 12th(14), 1st-4th(9), Assoc-acdm(8), 5th-6th(13), Prof-school(4), Doctorate(2), Preschool(2)
Row4	White	Bachelors(4682), HS-grad(8904), Masters(1537), 11th(977), Doctorate(369), Assoc-acdm(915), Some-college(6207), 9th(403), Assoc-voc(1207), Prof-school(514), 5th-6th(279), 7th-8th(553), 10th(762), 1st-4th(134), Preschool(38), 12th(335)

Porcentajes y tratamiento de datos

3.-Raza-Relaciones

RowID	race	Unique concatenate with count(relationship)
Row0	Amer-Indian-Eskimo	Husband(92), Not-in-family(81), Own-child(48), Unmarried(58), Other-relative(13), Wife(19)
Row1	Asian-Pac-Islander	Husband(410), Wife(69), Other-relative(82), Unmarried(91), Not-in-family(214), Own-child(173)
Row2	Black	Husband(671), Wife(153), Not-in-family(812), Unmarried(769), Own-child(555), Other-relative(164)
Row3	Other	Wife(16), Other-relative(28), Unmarried(37), Husband(80), Not-in-family(73), Own-child(37)
Row4	White	Not-in-family(7125), Husband(11940), Wife(1311), Own-child(4255), Unmarried(2491), Other-relative(694)

Porcentajes

4.-Raza-Sexo-Pais

	Row0	Amer-Indian-Eskimo	Female	United-States(114), Mexico(2), South(2), Columbia(1)
	Row1	Amer-Indian-Eskimo	Male	Mexico(6), United-States(182), Germany(1), Puerto-Rico(1), Philippines(1), Hong(1)
	Row2	Asian-Pac-Islander	Female	?(22), Philippines(73), United-States(115), England(1), Laos(8), South(28), India(10), China(20), Hong(5), Japan(10), Vietnam(22), Cambodia(2), Taiwan(14), Poland(1), Thailand(10), Germany(1), Canada(1), Portugal(1), Greece(1), Haiti(1)
	Row3	Asian-Pac-Islander	Male	India(75), ?(61), South(49), United-States(177), Cambodia(16), Thailand(6), Taiwan(34), Philippines(115), China(53), Japan(28), Vietnam(43), Laos(10), Iran(6), Trinadad&Tobago(2), Germany(2), Hong(12), Puerto-Rico(1), Mexico(1), Dominican-Republic(1), Ireland(1)
	Row4	Black	Female	Cuba(1), Jamaica(41), United-States(1429), Japan(2), Outlying-US(Guam-USVI-etc)(2), Haiti(19), Dominican-Republic(7), ?(32), Trinadad&Tobago(10), Germany(3), Honduras(1), England(1), Puerto-Rico(4), Cambodia(1), El-Salvador(1), France(1)
	Row5	Black	Male	United-States(1403), Germany(5), Haiti(24), ?(64), Jamaica(34), Trinadad&Tobago(6), England(7), Outlying-US(Guam-USVI-etc)(4), Dominican-Republic(5), Mexico(4), Nicaragua(2), Puerto-Rico(5), India(2), Japan(1), Cuba(2), Philippines(1)
	Row6	Other	Female	United-States(56), Puerto-Rico(9), Germany(1), Mexico(9), Jamaica(1), Columbia(4), ?(7), Dominican-Republic(8), Guatemala(3), Ecuador(3), El-Salvador(3), Taiwan(1), Trinadad&Tobago(1), Nicaragua(1), Cuba(1), Japan(1)
	Row7	Other	Male	United-States(73), Puerto-Rico(12), ?(11), Dominican-Republic(10), Mexico(31), Guatemala(1), Ecuador(6), India(5), Nicaragua(3), El-Salvador(1), Cuba(1), Canada(1), Columbia(3), Peru(1), Iran(2), Japan(1)
	Row8	White	Female	United-States(7968), ?(102), Honduras(6), England(30), Mexico(135), Columbia(19), Germany(55), France(11), Poland(18), Cuba(38), Italy(21), Guatemala(17), Dominican-Republic(20), El-Salvador(31), Canada(38), Peru(14), Puerto-Rico(39), Nicaragua(11), Portugal(11), Ireland(7), Iran(8), Ecuador(6), Outlying-US(Guam-USVI-etc)(5), Yugoslavia(3), Jamaica(1), Greece(4), Thailand(1), Scotland(5), China(1), Japan(7), Hong(1), Hungary(6), Vietnam(1), Holand-Netherlands(1), India(1)
	Row9	White	Male	United-States(17653), Puerto-Rico(43), ?(284), Mexico(455), Cuba(52), Canada(81), Iran(27), Italy(52), Poland(41), Ecuador(13), Portugal(25), Dominican-Republic(19), El-Salvador(70), Guatemala(43), England(51), Philippines(8), Germany(69), Japan(12), Yugoslavia(13), Jamaica(4), Scotland(7), Greece(24), Nicaragua(17), Columbia(32), Ireland(16), Peru(16), France(17), Honduras(6), India(7), Hungary(7), Taiwan(2), Thailand(1), South(1), Outlying-US(Guam-USVI-etc)(3), China(1), Vietnam(1), Hong(1)

5.- Dinero-raza-sexo

	RowID	race	sex	Mean(fnlwgt)
	Row0	Amer-Indian-Eskimo	Female	112950.731092437
	Row1	Amer-Indian-Eskimo	Male	125715.36458333336
	Row2	Asian-Pac-Islander	Female	147452.07514450865
	Row3	Asian-Pac-Islander	Male	166175.86580086604
	Row4	Black	Female	212971.38778135023
	Row5	Black	Male	242920.64499681254
	Row6	Other	Female	172519.64220183485
	Row7	Other	Male	213679.10493827166
	Row8	White	Female	183549.9669058082
	Row9	White	Male	188987.38614790735

2. Presente propiedades estadísticas del conjunto de datos

Row ID	D Min	D Max	D Mean	D Std. de...	D Variance	D Skewness	D Kurtosis	D Overall ...	I No. mis...	I No. NaNs	I No. +∞s	I No. -∞s	D Median	I Row co...	Histogram
age	17	90	38.582	13.64	186.061	0.559	-0.166	1,256,257	0	0	0	0	?	32561	17 90
fnlwgt	12,285	1,484,705	189,778.367	105,549.978	11,140,797,...	1.447	6.219	6,179,373,392	0	0	0	0	?	32561	12.285 1.484.705
education-num	1	16	10.081	2.573	6.619	-0.312	0.623	328,237	0	0	0	0	?	32561	1 16
capital-gain	0	99,999	1,077.649	7,385.292	54,542,539....	11.954	154.799	35,089,324	0	0	0	0	?	32561	0 99.999
capital-loss	0	4,356	87.304	402.96	162,376.938	4.595	20.377	2,842,700	0	0	0	0	?	32561	0 4.356
hours-per-week	1	99	40.437	12.347	152.459	0.228	2.917	1,316,684	0	0	0	0	?	32561	1 99

3. Describa las medidas generadas a partir de la matriz de confusión (archivo anexo)

Matriz de Confusión:

Row ID	I <=50K	I >50K
<=50K	6627	734
>50K	874	1440

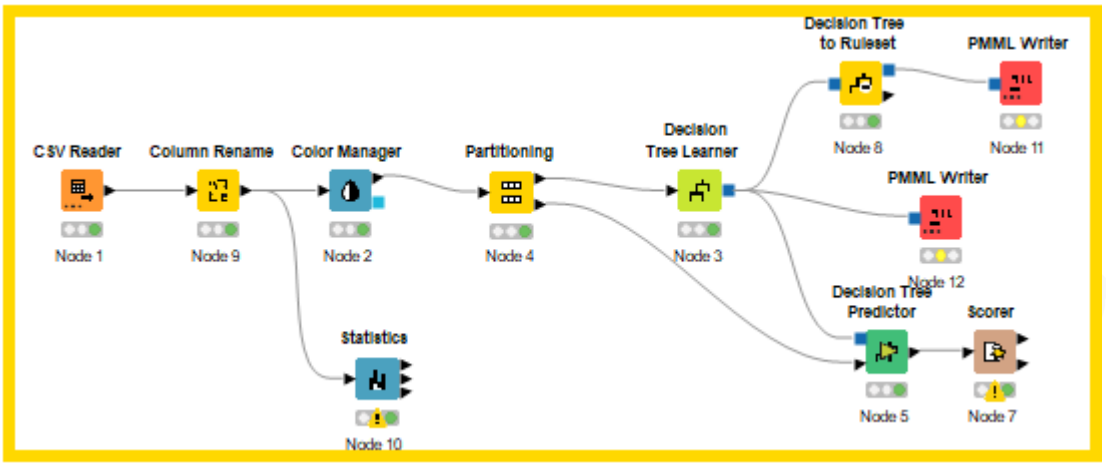
Row ID	I TruePositives	I FalsePositives	I TrueNegatives	I FalseNegatives	D Recall	D Precision	D Sensitivity	D Specificity	D F-measure	D Accuracy	D Cohen's kappa
<=50K	6627	874	1440	734	0.9	0.883	0.9	0.622	0.892	?	?
>50K	1440	734	6627	874	0.622	0.662	0.622	0.9	0.642	?	?
Overall	?	?	?	?	?	?	?	?	?	0.834	0.534

4. **Analice este comportamiento en función la cantidad de elementos de cada tipo que existen en el conjunto de datos**

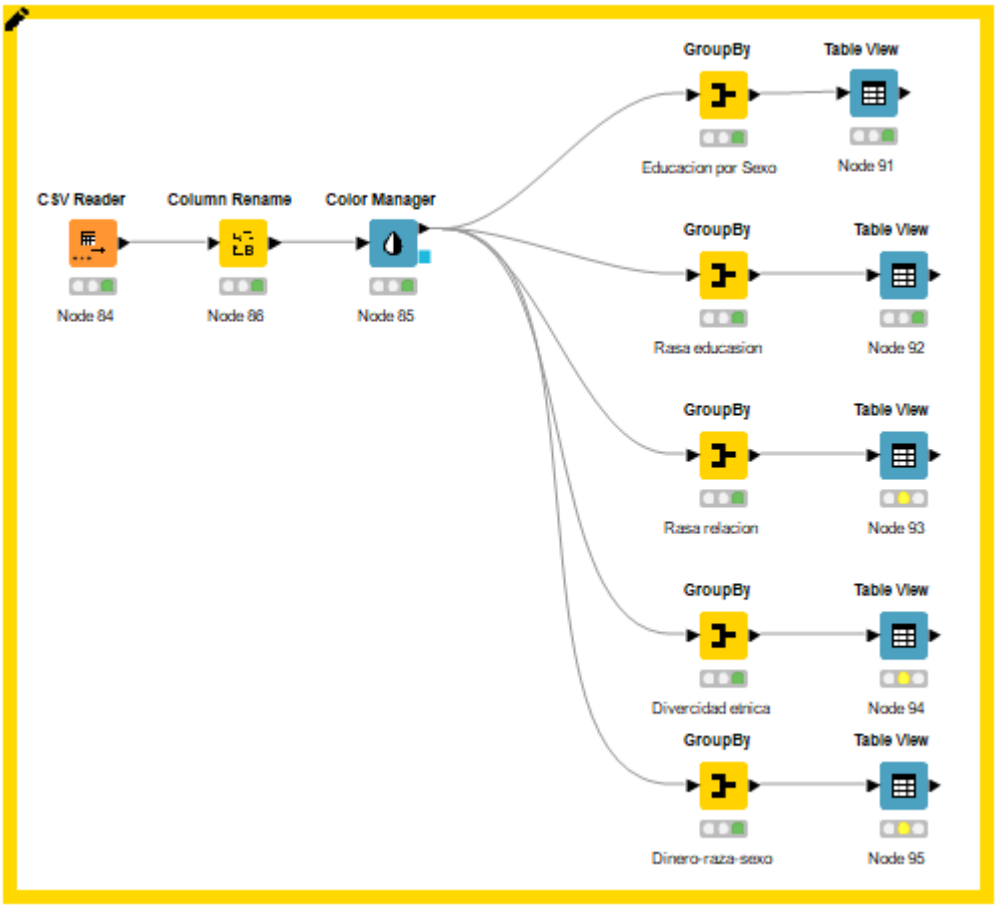
Medida	Cálculo	Interpretación
Positivo verdadero	**6627 =d**	El valor real es negativo y la prueba predijo también que el resultado era negativo
Falso Positivo	**734=b**	El valor real es negativo, y la prueba predijo que el resultado es positivo.
Falso Negativo	**874=c**	El valor real es positivo, y la prueba predijo que el resultado es negativo
Verdaderos Negativos	**1440=a**	El valor real es positivo y la prueba predijo también que era positivo.
Tasa de exactitud	**(6627+1440)/(6627+734+874+1440) = 8067/9675 = 0.83**	La cantidad de predicciones positivas que fueron correctas fue del 83%
Tasa de error	**(874+734)/(6627+734+874+1440) = 1608/9675 = 0.16**	La cantidad de predicciones que fueron incorrectas es del 16%
Precisión	**1440/(734+1440) = 0.66**	El porcentaje de casos positivos detectados fue 66%
Sensibilidad (*Recall*)	**1440/(874+1440) = 0.62**	En este caso la sensibilidad apenas es capaz de detectar correctamente, con un porcentaje del 62%
Tasa de positivos falsos	**734/(6627+734) =0.09**	La probabilidad de que se produzca una falsa alarma: que se dé un resultado positivo cuando el valor verdadero sea negativo es del 9%
Tasa de negativos falsos	**874/(1440+874) = 0.37**	La probabilidad de que la prueba pase por alto un verdadero positivo es del 37%
Especificidad	**1440/(734+1440) = 0.66**	La probabilidad de los casos negativos que el algoritmo ha clasificado correctamente es del 66%

5. Anexe el modelo y las reglas generadas.

Modelo



Consultas



Row ID	S Rule	D Record ...
Row1	$education-num$ <= 7.5 AND $education-num$ <= 12.5 AND $marital-status$ = "Married-civ-spouse" AND $capital-gain$ <= 5119.0 AND $education-num$ <= 14.5 AND $capital-loss$ <= 1881.5 AND $capital-gain$ <= 7073.5 => "<=50K"	1,016
Row2	age <= 23.5 AND $education-num$ > 7.5 AND $education-num$ <= 12.5 AND $marital-status$ = "Married-civ-spouse" AND $capital-gain$ <= 5119.0 AND $education-num$ <= 14.5 AND $capital-loss$ <= 1881.5 AND $capital-gain$ <=...	144
Row3	age <= 29.5 AND age > 23.5 AND $education-num$ > 7.5 AND $education-num$ <= 12.5 AND $marital-status$ = "Married-civ-spouse" AND $capital-gain$ <= 5119.0 AND $education-num$ <= 14.5 AND $capital-loss$ <= 1881.5 AN...	738
Row4	$hours-per-week$ <= 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ > 7.5 AND $education-num$ <= 12.5 AND $marital-status$ = "Married-civ-spouse" AND $capital-gain$ <= 5119.0 AND $education-num$ <= 14.5 AN...	471
Row5	age <= 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ > 7.5 AND $education-num$ <= 12.5 AND $marital-status$ = "Married-civ-spouse" AND $capital-g...	615
Row6	$fnlwgt$ <= 154616.0 AND $occupation$ = "Exec-managerial" AND $education-num$ <= 9.5 AND age > 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ >...	104
Row7	$fnlwgt$ > 154616.0 AND $occupation$ = "Exec-managerial" AND $education-num$ <= 9.5 AND age > 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ > ...	104
Row8	$occupation$ = "Handlers-cleaners" AND $education-num$ <= 9.5 AND age > 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ > 7.5 AND $education-num$...	73
Row9	$occupation$ = "Prof-specialty" AND $education-num$ <= 9.5 AND age > 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ > 7.5 AND $education-num$ <=...	42
Row10	$occupation$ = "Adm-clerical" AND $education-num$ <= 9.5 AND age > 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ > 7.5 AND $education-num$ <= 1...	154
Row11	$occupation$ = "Sales" AND $education-num$ <= 9.5 AND age > 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ > 7.5 AND $education-num$ <= 12.5 AN...	193
Row12	$occupation$ = "Craft-repair" AND $education-num$ <= 9.5 AND age > 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ > 7.5 AND $education-num$ <= 1...	501
Row13	$occupation$ = "Transport-moving" AND $education-num$ <= 9.5 AND age > 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ > 7.5 AND $education-num$...	239
Row14	$occupation$ = "Machine-op-inspct" AND $education-num$ <= 9.5 AND age > 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ > 7.5 AND $education-num$...	215
Row15	$occupation$ = "Other-service" AND $education-num$ <= 9.5 AND age > 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ > 7.5 AND $education-num$ <=...	114
Row16	$occupation$ = "Farming-fishing" AND $education-num$ <= 9.5 AND age > 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ > 7.5 AND $education-num$ <...	116
Row17	$occupation$ = "Tech-support" AND $education-num$ <= 9.5 AND age > 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ > 7.5 AND $education-num$ <= ...	30
Row18	$occupation$ = "?" AND $education-num$ <= 9.5 AND age > 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ > 7.5 AND $education-num$ <= 12.5 AND $...	75
Row19	$occupation$ = "Protective-serv" AND $education-num$ <= 9.5 AND age > 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ > 7.5 AND $education-num$ <...	44
Row20	$occupation$ = "Priv-house-serv" AND $education-num$ <= 9.5 AND age > 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ > 7.5 AND $education-num$ <...	4
Row21	$fnlwgt$ <= 72572.0 AND $education-num$ > 9.5 AND age > 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ > 7.5 AND $education-num$ <= 12.5 AND $...	208
Row22	$occupation$ = "Exec-managerial" AND $fnlwgt$ > 72572.0 AND $education-num$ > 9.5 AND age > 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ > 7.5 ...	259
Row23	$occupation$ = "Handlers-cleaners" AND $fnlwgt$ > 72572.0 AND $education-num$ > 9.5 AND age > 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ > 7....	32
Row24	$occupation$ = "Prof-specialty" AND $fnlwgt$ > 72572.0 AND $education-num$ > 9.5 AND age > 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ > 7.5 A...	108
Row25	$occupation$ = "Adm-clerical" AND $fnlwgt$ > 72572.0 AND $education-num$ > 9.5 AND age > 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ > 7.5 AND...	115
Row26	$occupation$ = "Sales" AND $fnlwgt$ > 72572.0 AND $education-num$ > 9.5 AND age > 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ > 7.5 AND $educ...	163
Row27	age <= 43.5 AND $occupation$ = "Craft-repair" AND $fnlwgt$ > 72572.0 AND $education-num$ > 9.5 AND age > 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $educa...	147
Row28	age > 43.5 AND $occupation$ = "Craft-repair" AND $fnlwgt$ > 72572.0 AND $education-num$ > 9.5 AND age > 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $educati...	142
Row29	$occupation$ = "Transport-moving" AND $fnlwgt$ > 72572.0 AND $education-num$ > 9.5 AND age > 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ > 7....	69
Row30	$occupation$ = "Machine-op-inspct" AND $fnlwgt$ > 72572.0 AND $education-num$ > 9.5 AND age > 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ > 7....	65
Row31	$occupation$ = "Other-service" AND $fnlwgt$ > 72572.0 AND $education-num$ > 9.5 AND age > 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ > 7.5 A...	57
Row32	$occupation$ = "Farming-fishing" AND $fnlwgt$ > 72572.0 AND $education-num$ > 9.5 AND age > 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ > 7.5 ...	41
Row33	$occupation$ = "Tech-support" AND $fnlwgt$ > 72572.0 AND $education-num$ > 9.5 AND age > 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ > 7.5 AN...	77
Row34	$occupation$ = "?" AND $fnlwgt$ > 72572.0 AND $education-num$ > 9.5 AND age > 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ > 7.5 AND $educatio...	24
Row35	$occupation$ = "Protective-serv" AND $fnlwgt$ > 72572.0 AND $education-num$ > 9.5 AND age > 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ > 7.5 ...	57
Row36	$occupation$ = "Priv-house-serv" AND $fnlwgt$ > 72572.0 AND $education-num$ > 9.5 AND age > 33.5 AND $capital-gain$ <= 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ > 7.5 ...	1
Row37	$capital-gain$ > 3120.0 AND $hours-per-week$ > 34.5 AND age > 29.5 AND age > 23.5 AND $education-num$ > 7.5 AND $education-num$ <= 12.5 AND $marital-status$ = "Married-civ-spouse" AND $capital-gain$ <= 5119.0 AND $...	147
Row38	$hours-per-week$ <= 21.5 AND $education-num$ > 12.5 AND $marital-status$ = "Married-civ-spouse" AND $capital-gain$ <= 5119.0 AND $education-num$ <= 14.5 AND $capital-loss$ <= 1881.5 AND $capital-gain$ <= 7073.5 => "<=50K"	112
Row39	age <= 27.5 AND $hours-per-week$ > 21.5 AND $education-num$ > 12.5 AND $marital-status$ = "Married-civ-spouse" AND $capital-gain$ <= 5119.0 AND $education-num$ <= 14.5 AND $capital-loss$ <= 1881.5 AND $capital-gain$ <...	107
Row40	$occupation$ = "Exec-managerial" AND age > 27.5 AND $hours-per-week$ > 21.5 AND $education-num$ > 12.5 AND $marital-status$ = "Married-civ-spouse" AND $capital-gain$ <= 5119.0 AND $education-num$ <= 14.5 AND $capital-l...	565
Row41	$occupation$ = "Handlers-cleaners" AND age > 27.5 AND $hours-per-week$ > 21.5 AND $education-num$ > 12.5 AND $marital-status$ = "Married-civ-spouse" AND $capital-gain$ <= 5119.0 AND $education-num$ <= 14.5 AND $capital...	15