SeminarioCD3_intro_pandas_p3

August 27, 2025

[1]:
```
import pandas as pd
```

[2]:
```
salarios=pd.read_csv("/Users/marcobarragan/Documents/
↪Seminario-de-Ciencia-de-datos/salary.csv")
```

[ ]:
```
```

[3]:
```
salarios.head()
```

[3]:

	age	workclass	fnlwgt	education	education-num	marital-status	occupation	relationship	race	sex	capital-gain	capital-loss	hours-per-week	native-country	salary
0	39	State-gov	77516	Bachelors	13	Never-married	Adm-clerical	Not-in-family	White	Male	2174	0	40	United-States	<=50K
1	50	Self-emp-not-inc	83311	Bachelors	13	Married-civ-spouse	Exec-managerial	Husband	White	Male	0	0	13	United-States	<=50K
2	38	Private	215646	HS-grad	9	Divorced	Handlers-cleaners	Not-in-family	White	Male	0	0	40	United-States	<=50K
3	53	Private	234721	11th	7	Married-civ-spouse	Handlers-cleaners	Husband	Black	Male	0	0	40	United-States	<=50K
4	28	Private	338409	Bachelors	13	Married-civ-spouse	Prof-specialty	Wife	Black	Female	0	0	40	Cuba	<=50K

[85]:
```
salarios.tail()
```

[85]:

	age	workclass	fnlwgt	education	education-num
32556	27	Private	257302	Assoc-acdm	12
32557	40	Private	154374	HS-grad	9
32558	58	Private	151910	HS-grad	9
32559	22	Private	201490	HS-grad	9
32560	52	Self-emp-inc	287927	HS-grad	9

```
           marital-status          occupation relationship    race      sex  \
32556   Married-civ-spouse        Tech-support         Wife   White   Female
32557   Married-civ-spouse   Machine-op-inspct      Husband   White     Male
32558              Widowed        Adm-clerical    Unmarried   White   Female
32559        Never-married        Adm-clerical    Own-child   White     Male
32560   Married-civ-spouse     Exec-managerial         Wife   White   Female

       capital-gain  capital-loss  hours-per-week  native-country  salary
32556             0             0              38   United-States   <=50K
32557             0             0              40   United-States    >50K
32558             0             0              40   United-States   <=50K
32559             0             0              20   United-States   <=50K
32560         15024             0              40   United-States    >50K
```

[86]:
```
salarios.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 32561 entries, 0 to 32560
Data columns (total 15 columns):
 #   Column          Non-Null Count  Dtype
---  ------          --------------  -----
 0   age             32561 non-null  int64
 1   workclass       32561 non-null  object
 2   fnlwgt          32561 non-null  int64
 3   education       32561 non-null  object
 4   education-num   32561 non-null  int64
 5   marital-status  32561 non-null  object
 6   occupation      32561 non-null  object
 7   relationship    32561 non-null  object
 8   race            32561 non-null  object
 9   sex             32561 non-null  object
 10  capital-gain    32561 non-null  int64
 11  capital-loss    32561 non-null  int64
 12  hours-per-week  32561 non-null  int64
 13  native-country  32561 non-null  object
 14  salary          32561 non-null  object
dtypes: int64(6), object(9)
memory usage: 3.7+ MB
```

[87]:
```
var_cat=['salary', 'workclass', 'education','marital-status', 'occupation',␣
 ↪'relationship', 'race', 'sex', 'native-country'] #lista de variables que␣
 ↪deberían tener categorías
for variable in var_cat: #para cada elemento de la lista var_cat
    salarios[variable] = salarios[variable].astype('category') #convertir la␣
 ↪variable a categorías
```

[88]:
```
salarios.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 32561 entries, 0 to 32560
Data columns (total 15 columns):
 #   Column          Non-Null Count  Dtype
---  ------          --------------  -----
 0   age             32561 non-null  int64
 1   workclass       32561 non-null  category
 2   fnlwgt          32561 non-null  int64
 3   education       32561 non-null  category
 4   education-num   32561 non-null  int64
 5   marital-status  32561 non-null  category
 6   occupation      32561 non-null  category
 7   relationship    32561 non-null  category
 8   race            32561 non-null  category
 9   sex             32561 non-null  category
 10  capital-gain    32561 non-null  int64
 11  capital-loss    32561 non-null  int64
 12  hours-per-week  32561 non-null  int64
 13  native-country  32561 non-null  category
 14  salary          32561 non-null  category
dtypes: category(9), int64(6)
memory usage: 1.8 MB
```

[89]:
```
salarios.describe(include='category')
```

[89]:

	workclass	education	marital-status	occupation	relationship	race	sex	native-country	salary
count	32561	32561	32561	32561	32561	32561	32561	32561	32561
unique	9	16	7	15	6	5	2	42	2
top	Private	HS-grad	Married-civ-spouse	Prof-specialty	Husband	White	Male	United-States	<=50K
freq	22696	10501	14976	4140	13193	27816	21790	29170	24720

Workclass - esta variable nos indica el tipo de empresa, hay 9 tipos diferentes y la frecuencia más alta es el tipo privado con un total de 22696 registros

[90]:
```
salarios['relationship']
```

[90]:
```
0         Not-in-family
1               Husband
2         Not-in-family
3               Husband
4                  Wife
              …
```

```
32556              Wife
32557           Husband
32558         Unmarried
32559         Own-child
32560              Wife
Name: relationship, Length: 32561, dtype: category
Categories (6, object): [' Husband', ' Not-in-family', ' Other-relative', ' Own-
child', ' Unmarried', ' Wife']
```

[91]:
```
salarios.describe()
```

[91]:
```
                age        fnlwgt  education-num  capital-gain  capital-loss  \
count  32561.000000  3.256100e+04   32561.000000  32561.000000  32561.000000
mean      38.581647  1.897784e+05      10.080679   1077.648844     87.303830
std       13.640433  1.055500e+05       2.572720   7385.292085    402.960219
min       17.000000  1.228500e+04       1.000000      0.000000      0.000000
25%       28.000000  1.178270e+05       9.000000      0.000000      0.000000
50%       37.000000  1.783560e+05      10.000000      0.000000      0.000000
75%       48.000000  2.370510e+05      12.000000      0.000000      0.000000
max       90.000000  1.484705e+06      16.000000  99999.000000   4356.000000

       hours-per-week
count    32561.000000
mean        40.437456
std         12.347429
min          1.000000
25%         40.000000
50%         40.000000
75%         45.000000
max         99.000000
```

[92]:
```
salarios["hours-per-day"]=salarios["hours-per-week"]/5
```

[93]:
```
salarios["hours-per-day"].head(10)
```

[93]:
```
0     8.0
1     2.6
2     8.0
3     8.0
4     8.0
5     8.0
6     3.2
7     9.0
8    10.0
9     8.0
Name: hours-per-day, dtype: float64
```

[94]:
```
salarios.head()
```

[94]:

	age	workclass	fnlwgt	education	education-num	\
0	39	State-gov	77516	Bachelors	13	
1	50	Self-emp-not-inc	83311	Bachelors	13	
2	38	Private	215646	HS-grad	9	
3	53	Private	234721	11th	7	
4	28	Private	338409	Bachelors	13	

	marital-status	occupation	relationship	race	sex	\
0	Never-married	Adm-clerical	Not-in-family	White	Male	
1	Married-civ-spouse	Exec-managerial	Husband	White	Male	
2	Divorced	Handlers-cleaners	Not-in-family	White	Male	
3	Married-civ-spouse	Handlers-cleaners	Husband	Black	Male	
4	Married-civ-spouse	Prof-specialty	Wife	Black	Female	

	capital-gain	capital-loss	hours-per-week	native-country	salary	\
0	2174	0	40	United-States	<=50K	
1	0	0	13	United-States	<=50K	
2	0	0	40	United-States	<=50K	
3	0	0	40	United-States	<=50K	
4	0	0	40	Cuba	<=50K	

	hours-per-day
0	8.0
1	2.6
2	8.0
3	8.0
4	8.0

[95]:
```
salarios["hours-per-week"].mean()
```

[95]:
```
np.float64(40.437455852092995)
```

[96]:
```
print("El número máximo de horas por semana es de: ",salarios['hours-per-week'].
  ↪max())
print("Mínimo de hrs por semana:",salarios['hours-per-week'].min())
print("Varianza de hrs por semana:",salarios['hours-per-week'].var())
print("Desviación estándar de hrs por semana: ",salarios['hours-per-week'].
  ↪std())
#print("Suma de hrs por semana: ",salarios['hours-per-week'].sum())
print("Promedio de hrs por semana: ",salarios['hours-per-week'].mean())
```

```
El número máximo de horas por semana es de:  99
Mínimo de hrs por semana: 1
Varianza de hrs por semana: 152.45899505045418
Desviación estándar de hrs por semana:  12.347428681731843
Promedio de hrs por semana:  40.437455852092995
```

[97]:
```
salarios["sex"].unique()
```

[97]:
```
[' Male', ' Female']
Categories (2, object): [' Female', ' Male']
```

[98]:
```
salarios["occupation"].unique()
```

[98]:
```
[' Adm-clerical', ' Exec-managerial', ' Handlers-cleaners', ' Prof-specialty', '
Other-service', …, ' Tech-support', ' ?', ' Protective-serv', ' Armed-Forces',
' Priv-house-serv']
Length: 15
Categories (15, object): [' ?', ' Adm-clerical', ' Armed-Forces', ' Craft-
repair', …, ' Protective-serv', ' Sales', ' Tech-support', ' Transport-
moving']
```

[ ]:
```

```

[99]:
```
lista_ocupaciones=salarios["occupation"].unique()
for valor in lista_ocupaciones:
    print(valor)
```

```
Adm-clerical
Exec-managerial
Handlers-cleaners
Prof-specialty
Other-service
Sales
Craft-repair
Transport-moving
Farming-fishing
Machine-op-inspct
Tech-support
?
Protective-serv
Armed-Forces
Priv-house-serv
```

[100]:
```
len(lista_ocupaciones)
```

[100]:
```
15
```

[101]:
```
lista_ocupaciones_corregidas=["Adm-clerical", "Exec-managerial",␣
 ↪"Handlers-cleaners", "Prof-specialty",
                               "Other-service", "Sales", "Craft-repair",␣
 ↪"Transport-moving", "Farming-fishing",
                               "Machine-op-inspct", "Tech-support",␣
 ↪"Desconocido", "Protective-serv",
                               "Armed-Forces","Priv-house-serv"]
```

[102]:
```
for i in range(0,15):
    salarios=salarios.replace({lista_ocupaciones[i]:
 ↪lista_ocupaciones_corregidas[i]})
```

```
/var/folders/qt/7mkpfxw95y54xs4g2ztqnb_c0000gn/T/ipykernel_62565/2699953996.py:2
: FutureWarning: The behavior of Series.replace (and DataFrame.replace) with
CategoricalDtype is deprecated. In a future version, replace will only be used
for cases that preserve the categories. To change the categories, use
ser.cat.rename_categories instead.
  salarios=salarios.replace({lista_ocupaciones[i]:lista_ocupaciones_corregidas[i
]})
```

[103]:
```
lista_ocupaciones=salarios["occupation"].unique()
for valor in lista_ocupaciones:
    print(valor)
```

```
Adm-clerical
Exec-managerial
Handlers-cleaners
Prof-specialty
Other-service
Sales
Craft-repair
Transport-moving
Farming-fishing
Machine-op-inspct
Tech-support
Desconocido
Protective-serv
Armed-Forces
Priv-house-serv
```

[104]:
```
salarios['relationship'] = salarios['relationship'].str.strip()
```

[105]:
```
frase="   hola a   todos"
frase.strip()
```

[105]:
```
'hola a   todos'
```

[106]:
```
lista_relationships=salarios["relationship"].unique()
for valor in lista_relationships:
    print(valor)
```

```
Not-in-family
Husband
Wife
Own-child
Unmarried
Other-relative
```

[107]:
```
#Ordenar de acuerdo con la variable hours-per-week de manera ascendente
salarios.sort_values("hours-per-week", ascending=True)
```

[107]:

```
       age          workclass  fnlwgt      education  education-num  \
19750   23            Private   72887        HS-grad              9
25078   74            Private  260669           10th              6
11451   27            Private  147951        HS-grad              9
8447    67        Desconocido  244122      Assoc-voc             11
32525   81        Desconocido  120478      Assoc-voc             11
…      …                  …       …              …              …
25806   49        Desconocido   31478        7th-8th              4
30610   51   Self-emp-not-inc   24790   Some-college             10
10143   35        Desconocido  164866           10th              6
4308    35   Self-emp-not-inc  166416        HS-grad              9
1887    55   Self-emp-not-inc  184425   Some-college             10

           marital-status         occupation    relationship  \
19750       Never-married       Craft-repair       Own-child
25078            Divorced      Other-service   Not-in-family
11451       Never-married  Machine-op-inspct  Other-relative
8447              Widowed        Desconocido   Not-in-family
32525            Divorced        Desconocido       Unmarried
…                     …                  …              …
25806   Married-civ-spouse        Desconocido         Husband
30610   Married-civ-spouse    Exec-managerial         Husband
10143            Divorced        Desconocido   Not-in-family
4308    Married-civ-spouse    Farming-fishing         Husband
1887    Married-civ-spouse    Farming-fishing         Husband

                    race      sex  capital-gain  capital-loss  \
19750   Asian-Pac-Islander     Male             0             0
25078                White   Female             0             0
11451                White     Male             0             0
8447                 White   Female             0             0
32525                White   Female             0             0
…                        …      …             …             …
25806                White     Male             0             0
30610                White     Male             0             0
10143                White     Male             0             0
4308                 White     Male             0             0
1887                 White     Male             0             0

       hours-per-week  native-country  salary  hours-per-day
19750               1         Vietnam   <=50K            0.2
25078               1   United-States   <=50K            0.2
11451               1   United-States   <=50K            0.2
8447                1   United-States   <=50K            0.2
```

```
32525               1     Desconocido   <=50K            0.2
…                 …             …     …              …
25806              99   United-States   <=50K          19.8
30610              99   United-States    >50K          19.8
10143              99   United-States   <=50K          19.8
4308               99   United-States   <=50K          19.8
1887               99   United-States    >50K          19.8

[32561 rows x 16 columns]
```

[108]:
```
salarios.head()
```

[108]:
```
   age          workclass  fnlwgt   education  education-num  \
0   39          State-gov   77516   Bachelors             13
1   50   Self-emp-not-inc   83311   Bachelors             13
2   38            Private  215646     HS-grad              9
3   53            Private  234721        11th              7
4   28            Private  338409   Bachelors             13

        marital-status         occupation   relationship    race      sex  \
0        Never-married       Adm-clerical  Not-in-family   White     Male
1   Married-civ-spouse    Exec-managerial        Husband   White     Male
2             Divorced  Handlers-cleaners  Not-in-family   White     Male
3   Married-civ-spouse  Handlers-cleaners        Husband   Black     Male
4   Married-civ-spouse     Prof-specialty           Wife   Black   Female

   capital-gain  capital-loss  hours-per-week  native-country  salary  \
0          2174             0              40   United-States   <=50K
1             0             0              13   United-States   <=50K
2             0             0              40   United-States   <=50K
3             0             0              40   United-States   <=50K
4             0             0              40            Cuba   <=50K

   hours-per-day
0            8.0
1            2.6
2            8.0
3            8.0
4            8.0
```

[109]:
```
salarios.sort_values("native-country", ascending=True)
```

[109]:
```
       age          workclass  fnlwgt      education  education-num  \
21541   27            Private  169958        5th-6th              3
18277   90            Private  311184      Bachelors             13
27305   34   Self-emp-not-inc  114185      Bachelors             13
5854    40            Private   37618   Some-college             10
```

```
27299   37   Self-emp-not-inc  327164   Some-college             10
…    …                  …     …            …            …
23814   41   Self-emp-not-inc  145441      Assoc-voc             11
7287    35            Private  164526        HS-grad              9
31519   29            Private  273051      Bachelors             13
4447    25            Private  191230   Some-college             10
18247   41            Private  324629      Bachelors             13

            marital-status        occupation   relationship    race      sex  \
21541        Never-married      Craft-repair      Own-child   White     Male
18277   Married-civ-spouse             Sales        Husband   White     Male
27305            Divorced  Transport-moving  Not-in-family   White     Male
5854    Married-civ-spouse      Craft-repair        Husband   White     Male
27299   Married-civ-spouse      Craft-repair        Husband   White     Male
…                      …               …             …     …      …
23814   Married-civ-spouse      Craft-repair        Husband   White     Male
7287    Married-civ-spouse     Other-service        Husband   White     Male
31519   Married-civ-spouse   Exec-managerial        Husband   White     Male
4447         Never-married   Exec-managerial      Own-child   White   Female
18247   Married-civ-spouse   Exec-managerial        Husband   White     Male

       capital-gain  capital-loss  hours-per-week native-country  salary  \
21541             0             0              40    Desconocido   <=50K
18277             0             0              20    Desconocido   <=50K
27305             0             0              50    Desconocido   <=50K
5854              0             0              40    Desconocido   <=50K
27299             0             0              70    Desconocido   <=50K
…               …             …               …              …      …
23814             0             0              40     Yugoslavia   <=50K
7287              0             0              40     Yugoslavia    >50K
31519             0             0              52     Yugoslavia    >50K
4447              0             0              40     Yugoslavia   <=50K
18247             0             0              40     Yugoslavia   <=50K

       hours-per-day
21541            8.0
18277            4.0
27305           10.0
5854             8.0
27299           14.0
…                …
23814            8.0
7287             8.0
31519           10.4
4447             8.0
18247            8.0
```

```
[32561 rows x 16 columns]
```

[110]:
```
salarios.keys()
```

[110]:
```
Index(['age', 'workclass', 'fnlwgt', 'education', 'education-num',
       'marital-status', 'occupation', 'relationship', 'race', 'sex',
       'capital-gain', 'capital-loss', 'hours-per-week', 'native-country',
       'salary', 'hours-per-day'],
      dtype='object')
```

[111]:
```
salarios[salarios["sex"]==" Male"]["marital-status"]
```

[111]:
```
0              Never-married
1         Married-civ-spouse
2                   Divorced
3         Married-civ-spouse
7         Married-civ-spouse
                 ...
32553          Never-married
32554     Married-civ-spouse
32555          Never-married
32557     Married-civ-spouse
32559          Never-married
Name: marital-status, Length: 21790, dtype: category
Categories (7, object): [' Divorced', ' Married-AF-spouse', ' Married-civ-
spouse', ' Married-spouse-absent', ' Never-married', ' Separated', ' Widowed']
```

[112]:
```
salarios["sex"].unique()
```

[112]:
```
[' Male', ' Female']
Categories (2, object): [' Female', ' Male']
```

[113]:
```
salarios["sex"]=salarios["sex"].replace({" Male": "Male", " Female": "Female"})
```

```
/var/folders/qt/7mkpfxw95y54xs4g2ztqnb_c0000gn/T/ipykernel_62565/2192342957.py:1
: FutureWarning: The behavior of Series.replace (and DataFrame.replace) with
CategoricalDtype is deprecated. In a future version, replace will only be used
for cases that preserve the categories. To change the categories, use
ser.cat.rename_categories instead.
  salarios["sex"]=salarios["sex"].replace({" Male": "Male", " Female":
"Female"})
```

[114]:
```
salarios[salarios["sex"]=="Male"]
```

[114]:
```
    age          workclass  fnlwgt      education  education-num  \
0    39          State-gov   77516      Bachelors             13
1    50   Self-emp-not-inc   83311      Bachelors             13
2    38            Private  215646        HS-grad              9
```

```
3       53            Private  234721           11th              7
7       52   Self-emp-not-inc  209642        HS-grad              9
…    …                  …     …              …              …
32553   32            Private  116138        Masters             14
32554   53            Private  321865        Masters             14
32555   22            Private  310152   Some-college             10
32557   40            Private  154374        HS-grad              9
32559   22            Private  201490        HS-grad              9

           marital-status         occupation   relationship  \
0           Never-married       Adm-clerical  Not-in-family
1      Married-civ-spouse    Exec-managerial        Husband
2                Divorced  Handlers-cleaners  Not-in-family
3      Married-civ-spouse  Handlers-cleaners        Husband
7      Married-civ-spouse    Exec-managerial        Husband
…                     …               …           …
32553       Never-married       Tech-support  Not-in-family
32554  Married-civ-spouse    Exec-managerial        Husband
32555       Never-married    Protective-serv  Not-in-family
32557  Married-civ-spouse  Machine-op-inspct        Husband
32559       Never-married       Adm-clerical      Own-child

                     race   sex  capital-gain  capital-loss  hours-per-week  \
0                   White  Male          2174             0              40
1                   White  Male             0             0              13
2                   White  Male             0             0              40
3                   Black  Male             0             0              40
7                   White  Male             0             0              45
…                     …   …              …             …              …
32553  Asian-Pac-Islander  Male             0             0              11
32554               White  Male             0             0              40
32555               White  Male             0             0              40
32557               White  Male             0             0              40
32559               White  Male             0             0              20

       native-country  salary  hours-per-day
0       United-States   <=50K            8.0
1       United-States   <=50K            2.6
2       United-States   <=50K            8.0
3       United-States   <=50K            8.0
7       United-States    >50K            9.0
…                 …     …              …
32553          Taiwan   <=50K            2.2
32554   United-States    >50K            8.0
32555   United-States   <=50K            8.0
32557   United-States    >50K            8.0
32559   United-States   <=50K            4.0
```

```
[21790 rows x 16 columns]
```

[115]:
```
salarios["salary"].unique()
```

[115]:
```
[' <=50K', ' >50K']
Categories (2, object): [' <=50K', ' >50K']
```

Modificar la variable salary de modo que los valores "<=50K" sean 0s y ">50" sean 1s

[116]:
```
salarios["salary"]=salarios["salary"].replace({" <=50K": 0, " >50K": 1})
salarios.head()
```

```
/var/folders/qt/7mkpfxw95y54xs4g2ztqnb_c0000gn/T/ipykernel_62565/641816486.py:1:
FutureWarning: Downcasting behavior in `replace` is deprecated and will be
removed in a future version. To retain the old behavior, explicitly call
`result.infer_objects(copy=False)`. To opt-in to the future behavior, set
`pd.set_option('future.no_silent_downcasting', True)`
  salarios["salary"]=salarios["salary"].replace({" <=50K": 0, " >50K": 1})
/var/folders/qt/7mkpfxw95y54xs4g2ztqnb_c0000gn/T/ipykernel_62565/641816486.py:1:
FutureWarning: The behavior of Series.replace (and DataFrame.replace) with
CategoricalDtype is deprecated. In a future version, replace will only be used
for cases that preserve the categories. To change the categories, use
ser.cat.rename_categories instead.
  salarios["salary"]=salarios["salary"].replace({" <=50K": 0, " >50K": 1})
```

[116]:

	age	workclass	fnlwgt	education	education-num	\
0	39	State-gov	77516	Bachelors	13	
1	50	Self-emp-not-inc	83311	Bachelors	13	
2	38	Private	215646	HS-grad	9	
3	53	Private	234721	11th	7	
4	28	Private	338409	Bachelors	13	

	marital-status	occupation	relationship	race	sex	\
0	Never-married	Adm-clerical	Not-in-family	White	Male	
1	Married-civ-spouse	Exec-managerial	Husband	White	Male	
2	Divorced	Handlers-cleaners	Not-in-family	White	Male	
3	Married-civ-spouse	Handlers-cleaners	Husband	Black	Male	
4	Married-civ-spouse	Prof-specialty	Wife	Black	Female	

	capital-gain	capital-loss	hours-per-week	native-country	salary	\
0	2174	0	40	United-States	0	
1	0	0	13	United-States	0	
2	0	0	40	United-States	0	
3	0	0	40	United-States	0	
4	0	0	40	Cuba	0	

	hours-per-day

```
0            8.0
1            2.6
2            8.0
3            8.0
4            8.0
```

1. ¿Cuál es la edad promedio de los empleados?
2. ¿En qué porcentajes se distribuyen las diferentes raza?
3. De las personas que ganan más de 50 mil, ¿cuántas son mujeres?
4. Analizar la relación entre el nivel de estudios y los sueldos

[123]:
```
promedio_edades=salarios["age"].mean()
print("La edad promedio de los empleados es de aproximadamente",␣
 ↪round(promedio_edades), "años")
```

```
La edad promedio de los empleados es de aproximadamente 39 años
```

[124]:
```
salarios["age"].count()
```

[124]:
```
np.int64(32561)
```

[125]:
```
salarios["race"].unique()
```

[125]:
```
[' White', ' Black', ' Asian-Pac-Islander', ' Amer-Indian-Eskimo', ' Other']
Categories (5, object): [' Amer-Indian-Eskimo', ' Asian-Pac-Islander', ' Black',
' Other', ' White']
```

[126]:
```
porcentajes_raza = salarios["race"].value_counts(normalize=True) * 100
print(porcentajes_raza)
```

```
race
White                 85.427352
Black                  9.594300
Asian-Pac-Islander     3.190934
Amer-Indian-Eskimo     0.955130
Other                  0.832284
Name: proportion, dtype: float64
```

[122]:
```
tabla_estudios_ingresos = pd.crosstab(salarios["education"],␣
 ↪salarios["salary"], normalize="index") * 100
print(tabla_estudios_ingresos)
```

```
salary                0          1
education
10th           93.354770   6.645230
11th           94.893617   5.106383
12th           92.378753   7.621247
1st-4th        96.428571   3.571429
5th-6th        95.195195   4.804805
7th-8th        93.808050   6.191950
```

9th	94.747082	5.252918
Assoc-acdm	75.164011	24.835989
Assoc-voc	73.878437	26.121563
Bachelors	58.524743	41.475257
Doctorate	25.907990	74.092010
HS-grad	84.049138	15.950862
Masters	44.341265	55.658735
Preschool	100.000000	0.000000
Prof-school	26.562500	73.437500
Some-college	80.976546	19.023454