Data Visualization

Revision Class 01 - Basic Plots and Random Variables

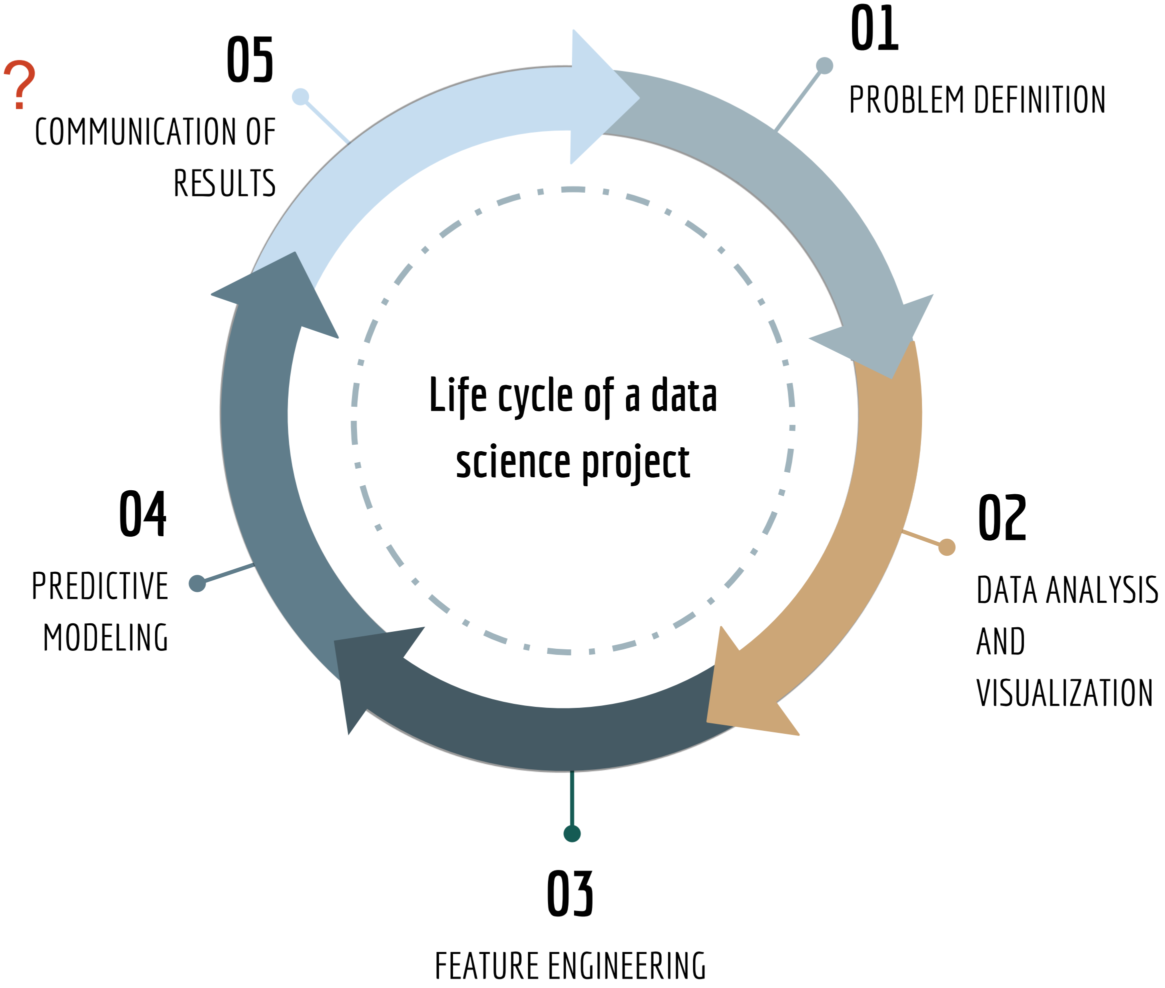
DigitalLab@LaPlataforme_

What is Data Science?

Data science is a discipline that aims to **develop a product based on data**.

Uses approaches from the **data analysis** and **machine learning**.

Visualization plays an important role on steps: **02**, **04** and **05.**



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- Recognize machine learning model **relevant features**.
- **Communicate results** to team members.

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The random variables can be of different types:

- Numerical
  - Continuous
  - Discrete (Infinite or finite set of numerable values)
- Categorical
- Ordinal

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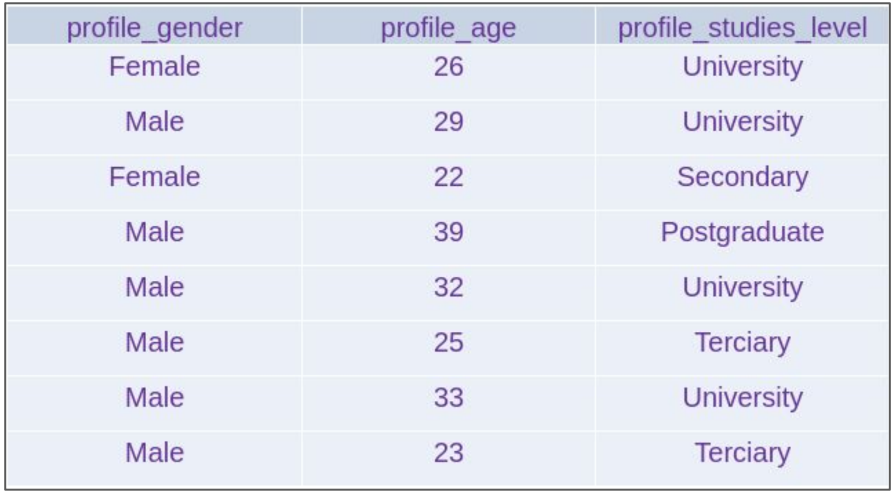

profile_gender	profile_age	profile_studies_level
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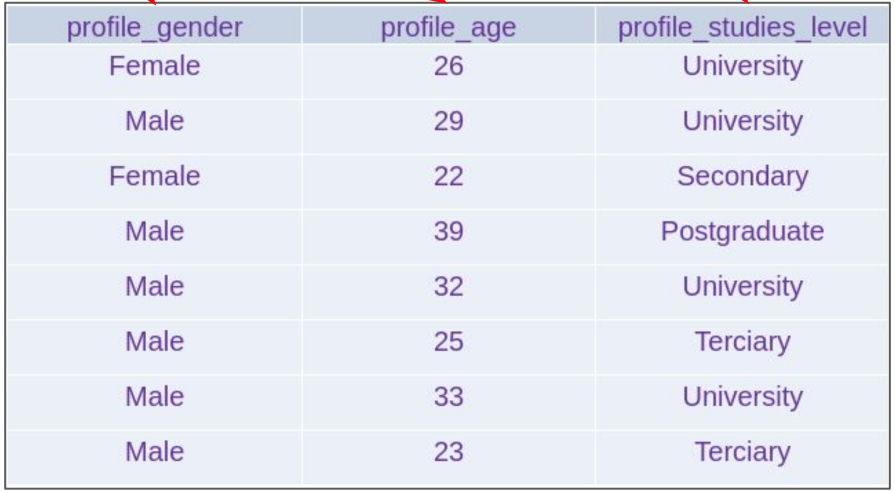

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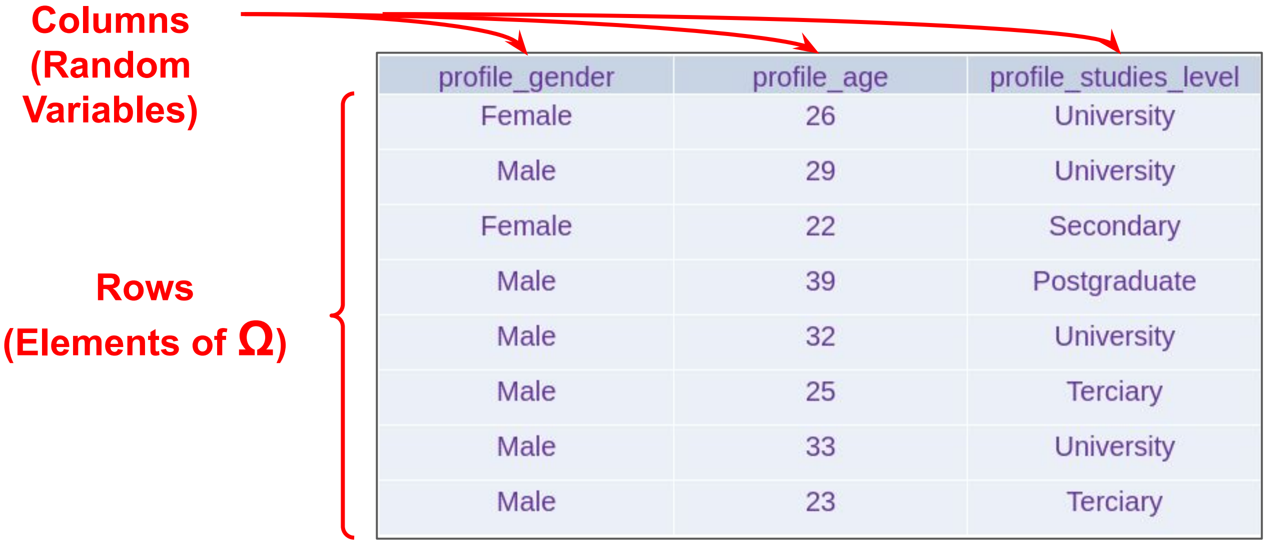

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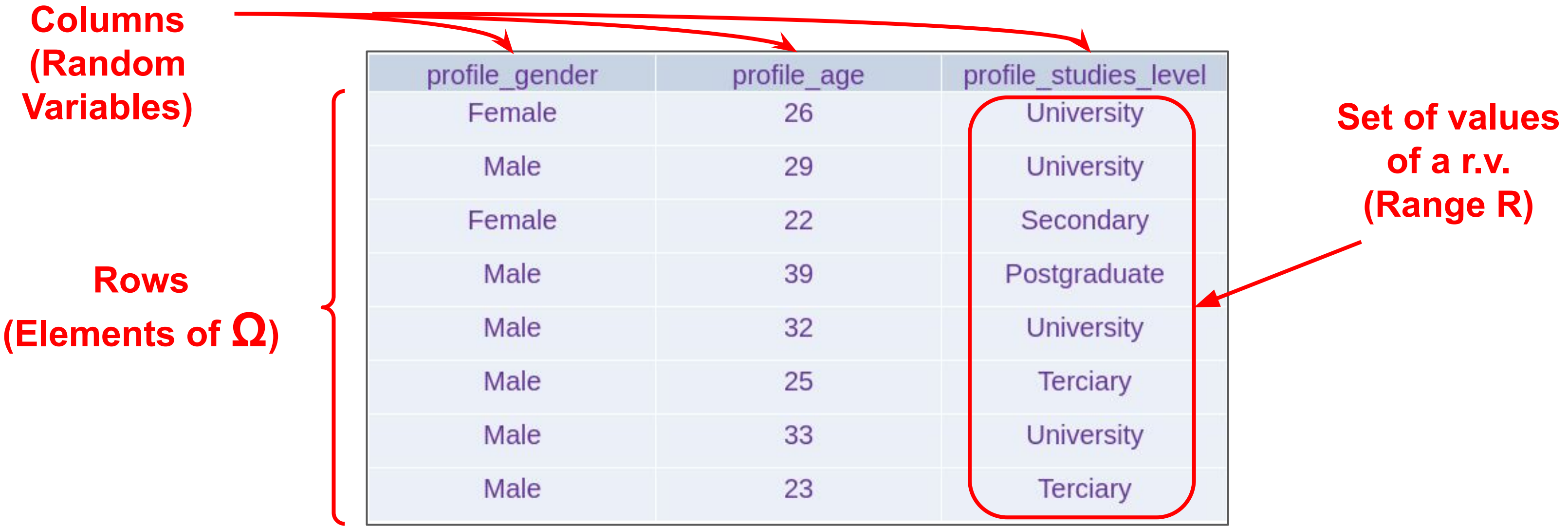

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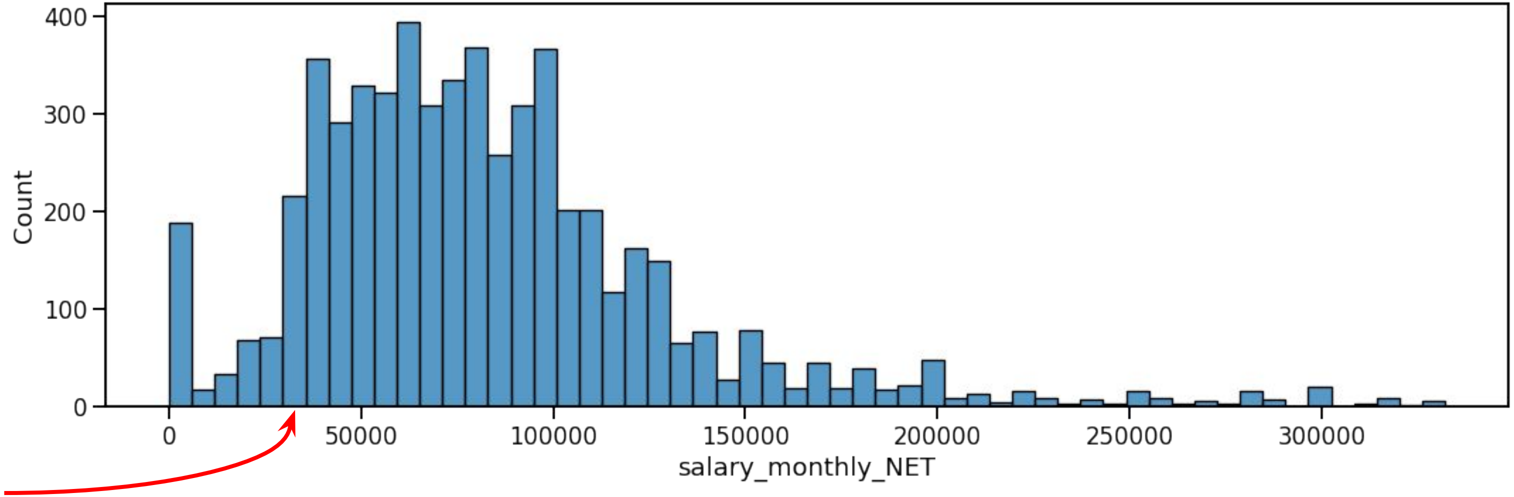

Intervals

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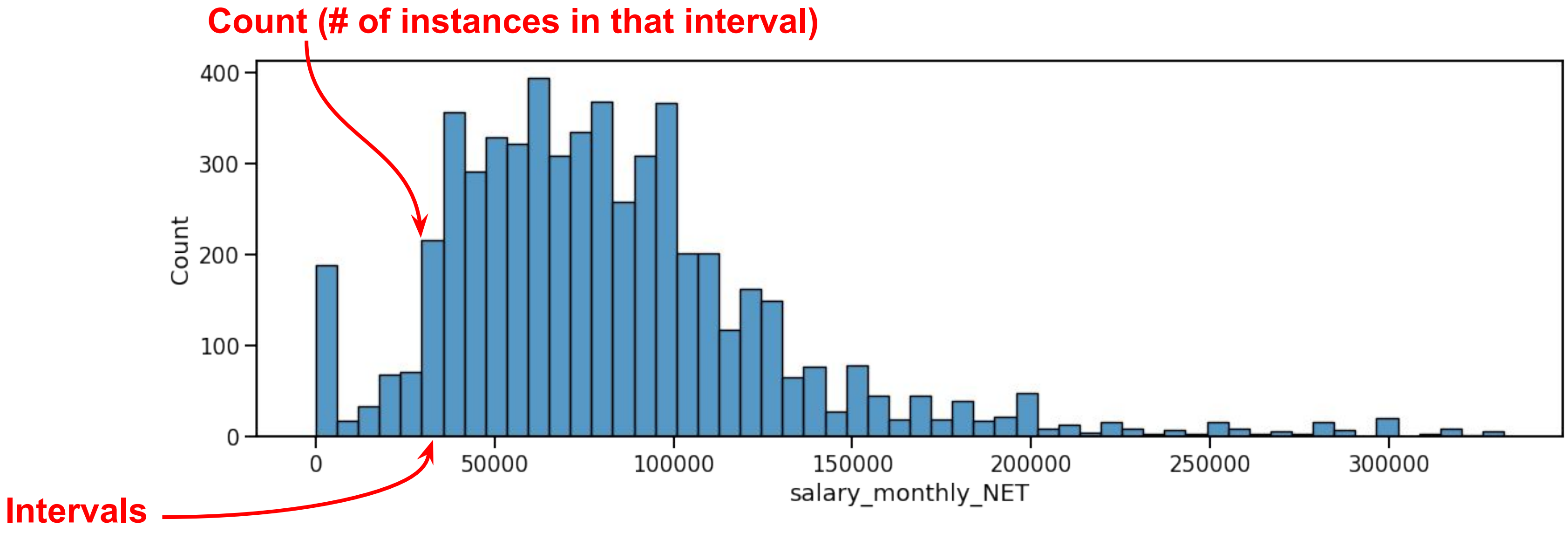

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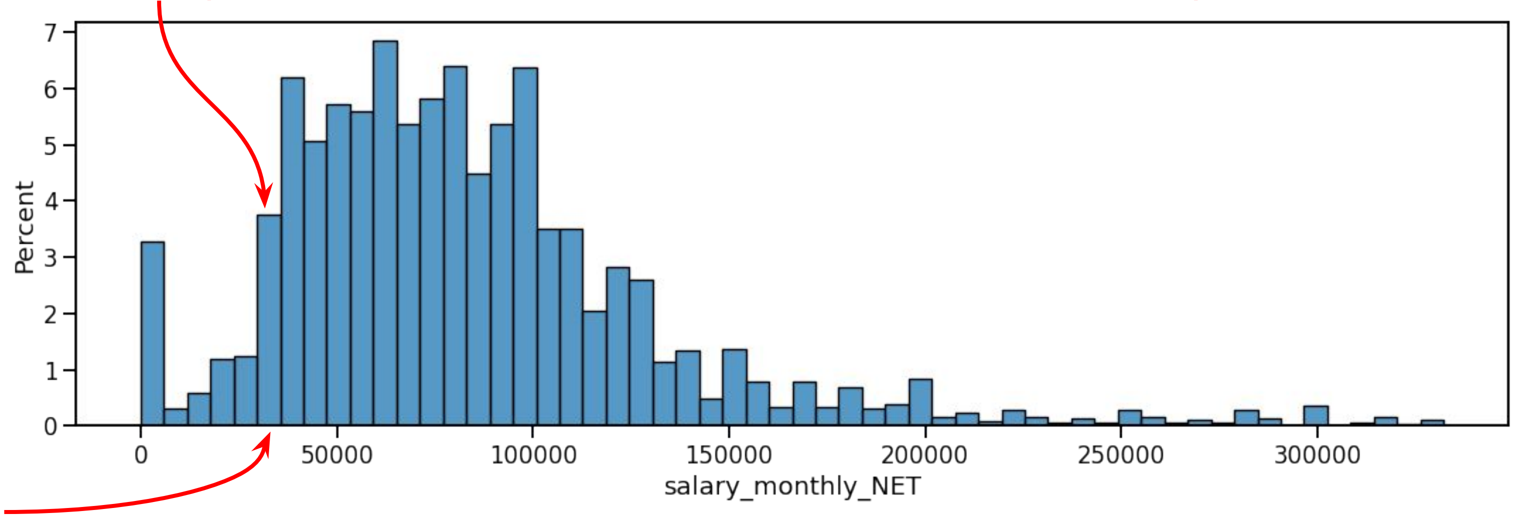
Percent (# of instances in that interval / total # of instances * 100)



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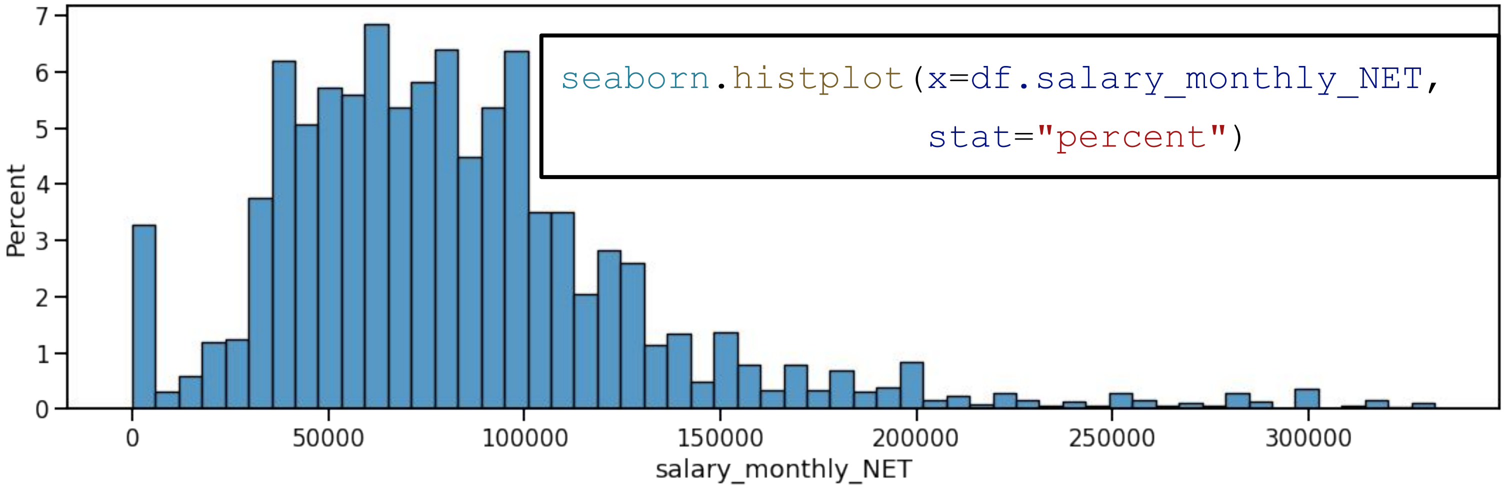

```
seaborn.histplot(x=df.salary_monthly_NET,
                 stat="percent")
```

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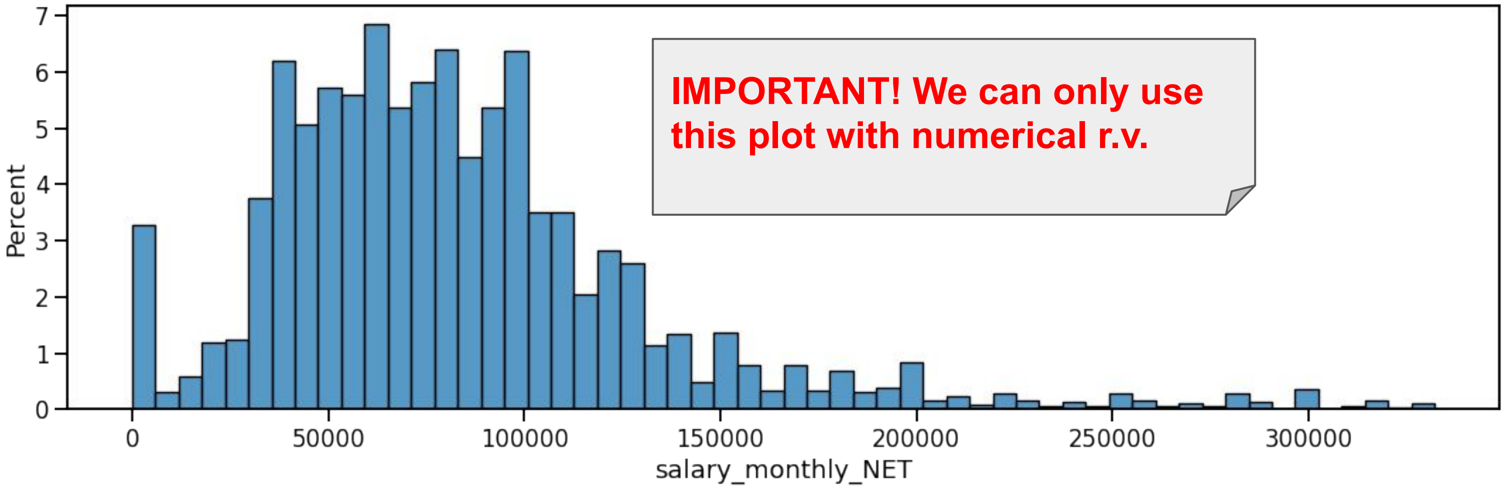
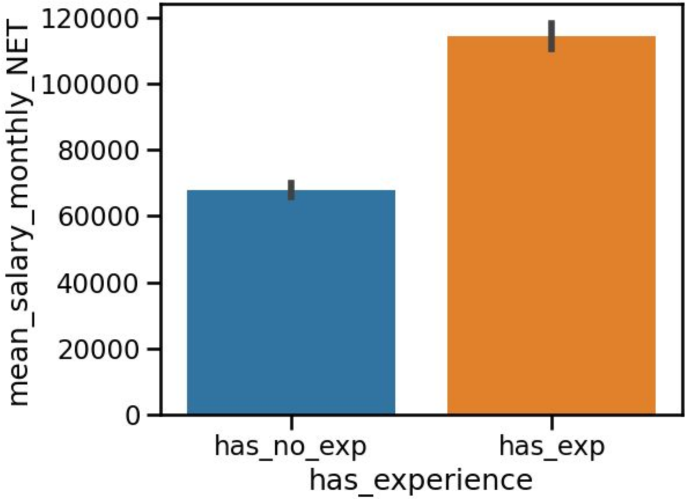


IMPORTANT! We can only use this plot with numerical r.v.

Basic Plots: Barplot

It represents an **estimate of central tendency for a numeric variable** with the height of each rectangle and provides some indication of the **uncertainty around that estimate** using error bars.



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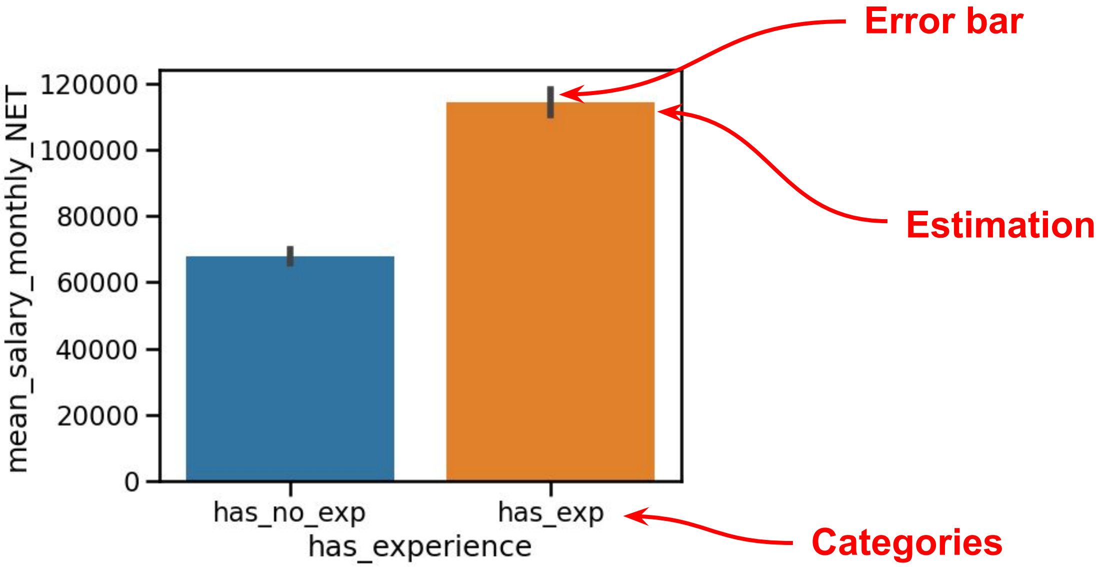

Error bar

Estimation

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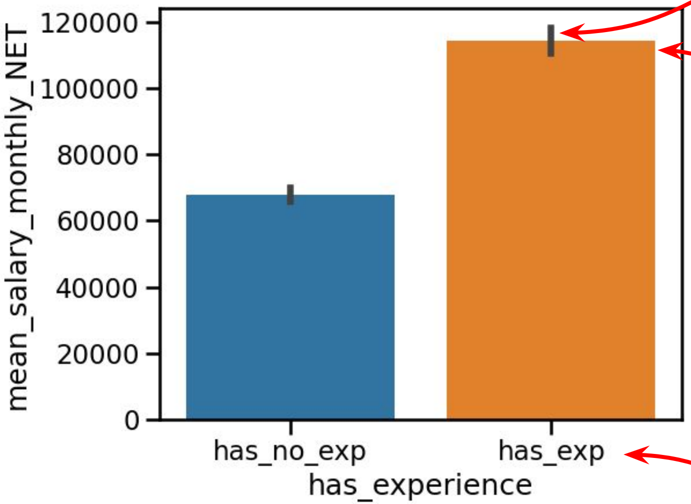
```



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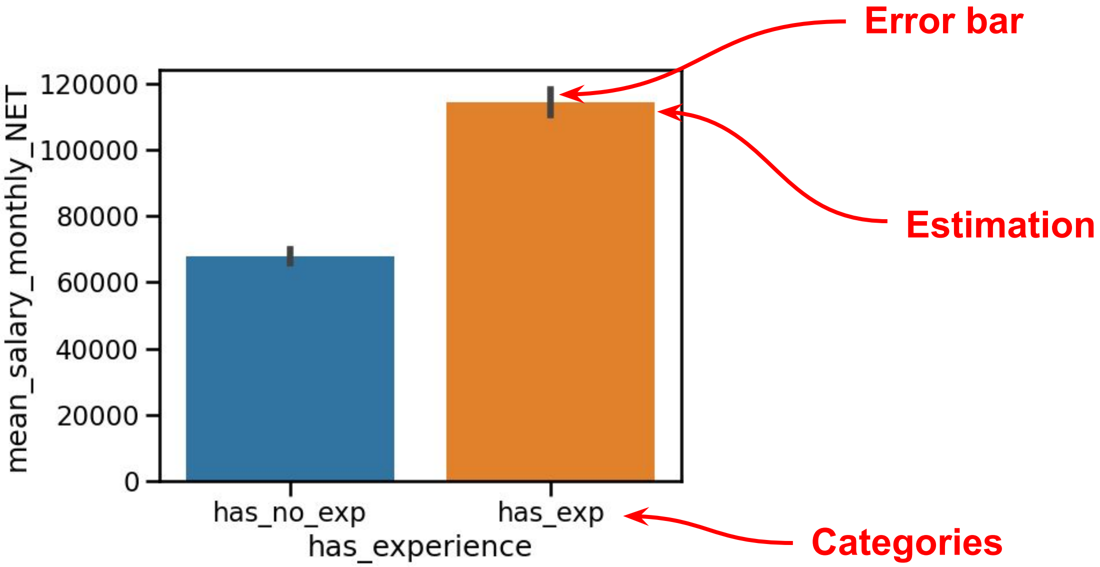

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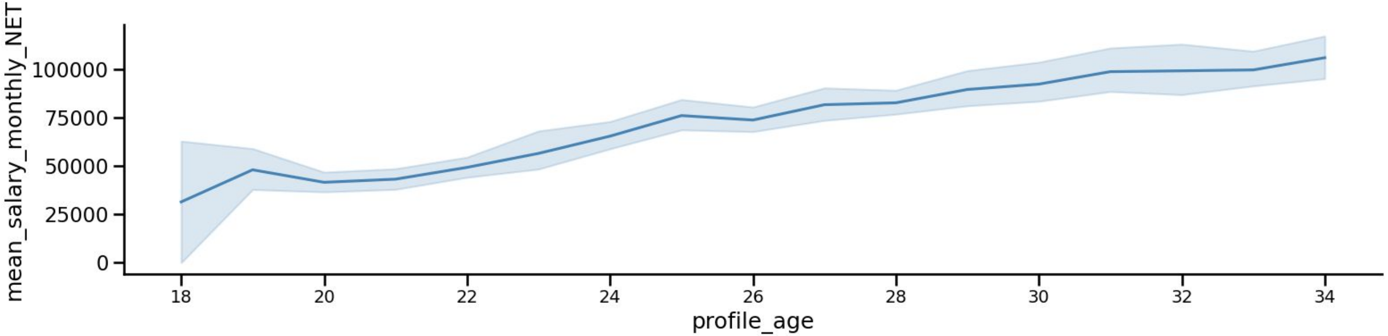
The plot **aggregates over multiple y values at each value of x** and shows an estimate of the central tendency and a confidence interval for that estimate.



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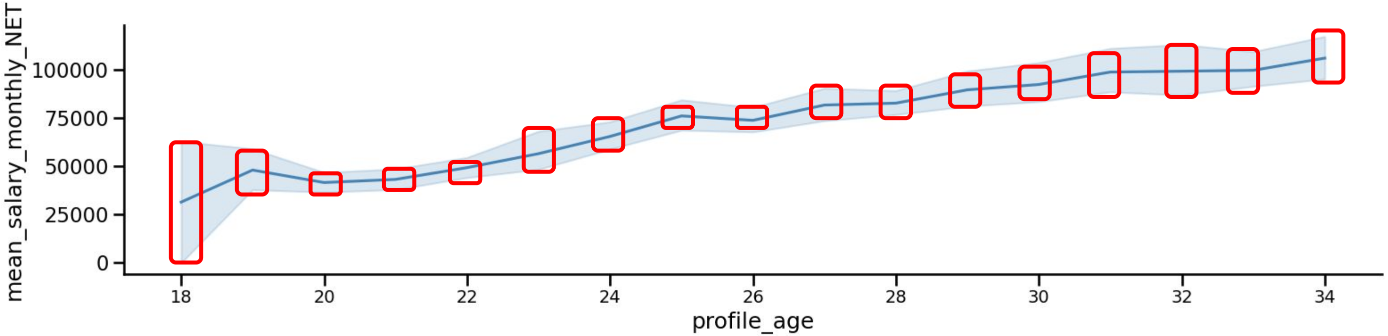

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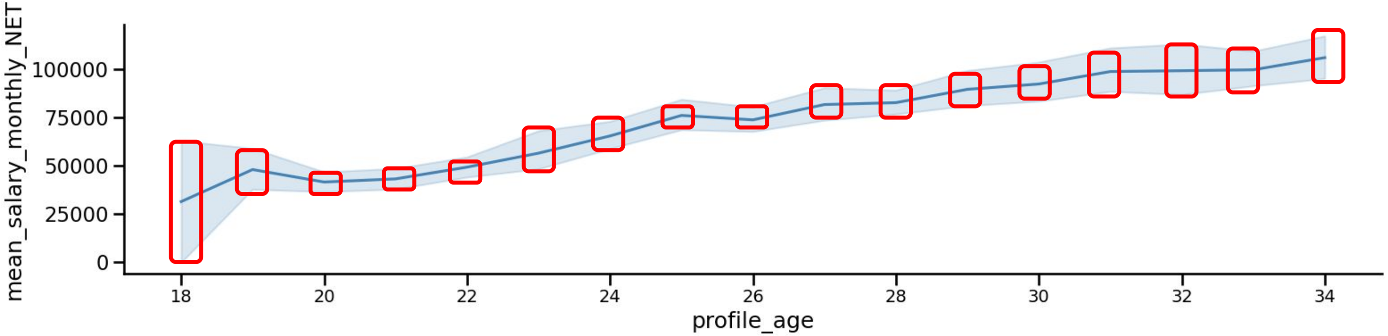

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seaborn.lineplot(data=df, x="profile_age", y="salary_monthly_NET")
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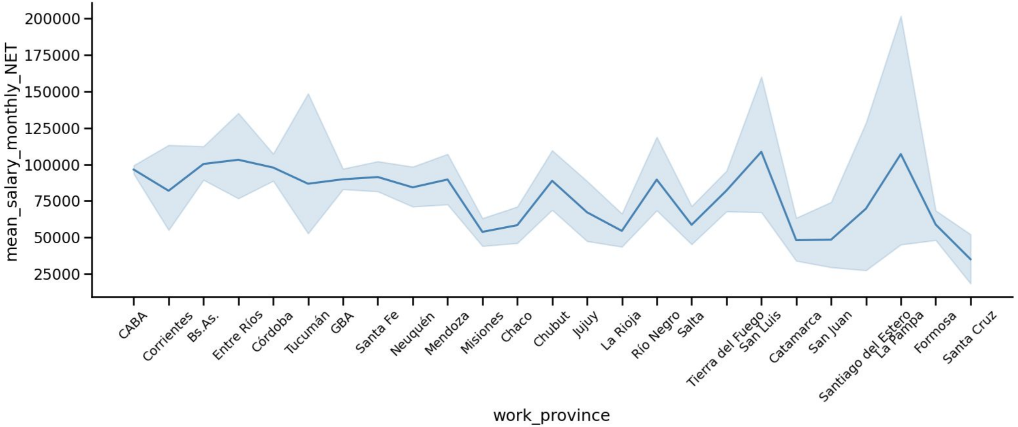
IMPORTANT! Don’t use a categorical r.v. on the x axis.



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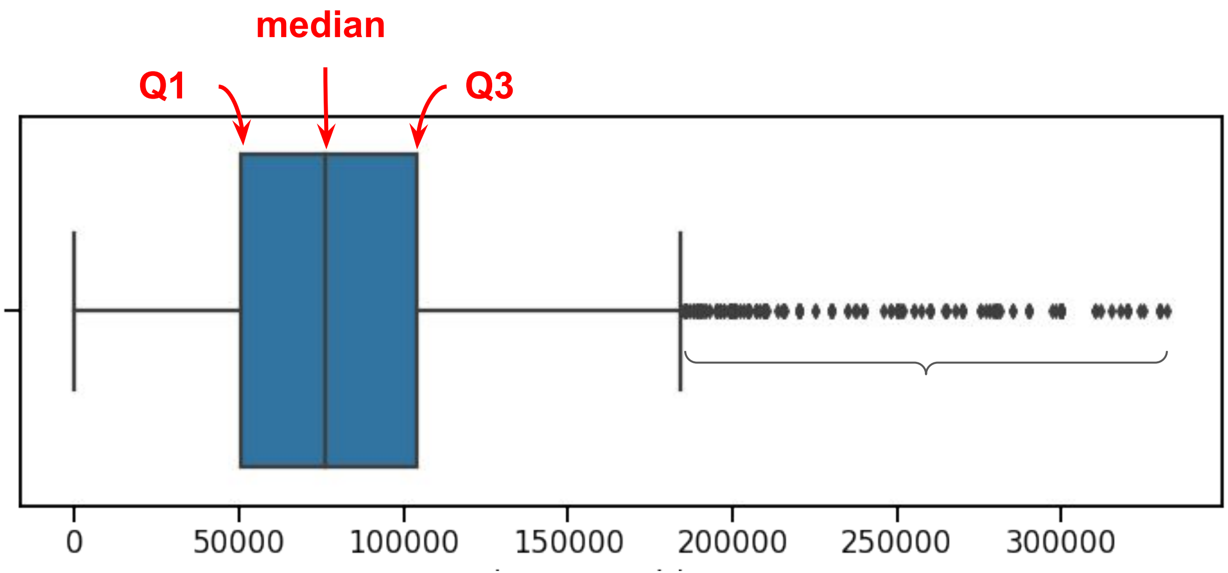
The **box shows the quartiles** of the dataset while the **whiskers extend to show the rest of the distribution**, except for points that are determined to be “outliers” using a method that is a function of the inter-quartile range.



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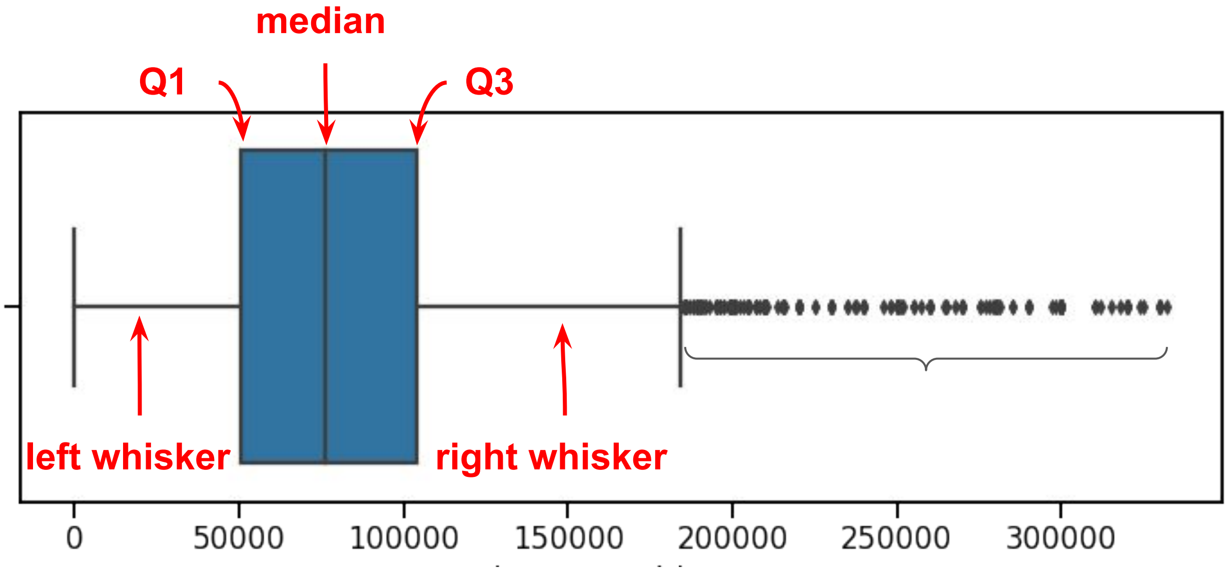

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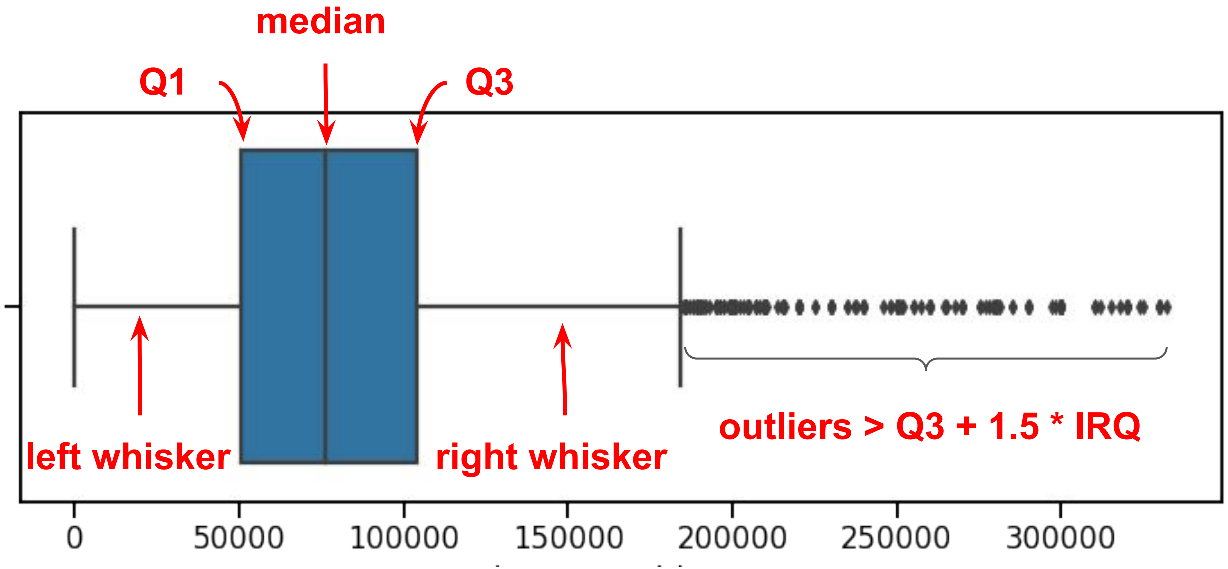

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seaborn.boxplot(x=data)
```

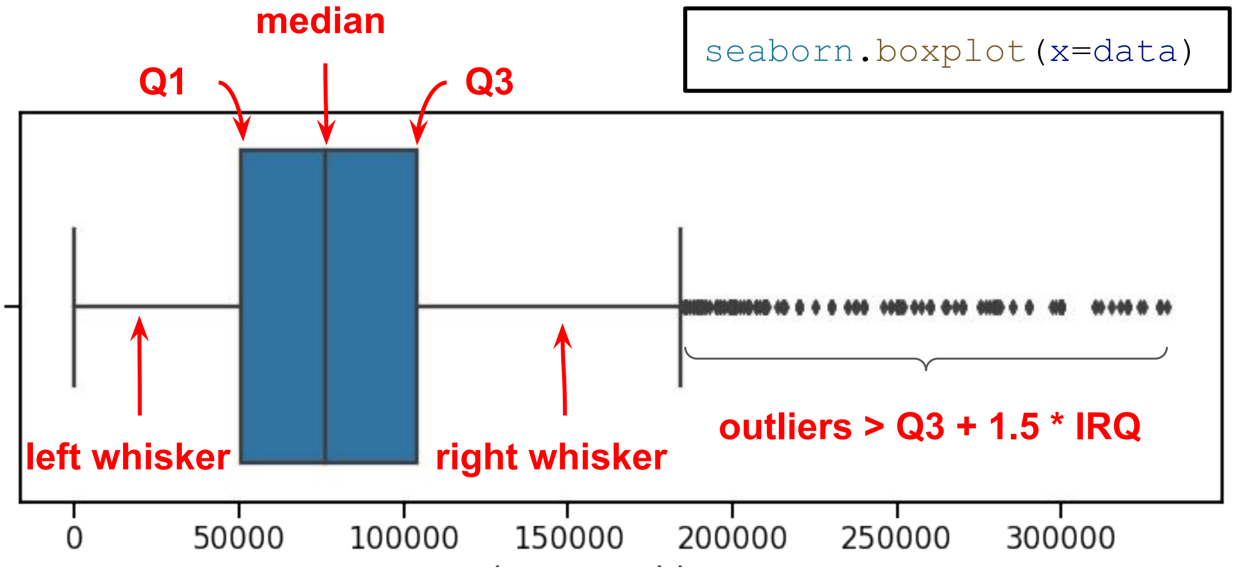

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Events can be thought as **restrictions applied to one or several r.v.** Conditional probability between the two events is defined as:

$\mathbf{P}(A|B) = \mathbf{P}(A \text{ and } B) / P(B)$

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Filterings: Create a Pandas Series of booleans and give it as input to a dataframe of the same shape.

```
df[
    (df["profile_gender"] == "Male") &
    (df["profile_age"] < 30)
]
```

Condition to filter