rare_event_rule

February 28, 2024

1 Rare Event Rule & Statistical Significance

{Rare Event Rule} :class: dropdown If under an assumption the probability of an observed is *very small* (a "rare" event), then we conclude that the assumption is probably not true.

Example

Assume A coin is fair, i.e., $P(H) = P(T) = \frac{1}{2}$

Observation Flip the coin N times.

1.0.1 testalert

text in alert

1.1 something elsse

[17]:
```
import ipywidgets as widgets
from ipywidgets import HBox, VBox
import numpy as np
import matplotlib.pyplot as plt
from IPython.display import display

from ipywidgets import IntSlider, Label
%matplotlib inline
```

[19]:
```
@widgets.interact
def f(n=1):
    p = (.5)**n
```

```
interactive(children=(IntSlider(value=1, description='n', max=3, min=-1),␣
↪Output()), _dom_classes=('widget-int…
```

```
Label(value='\\(e=mc^2\\)')
```

[26]:
```
IntSlider(description=r'\(\int_0^t f\)')
```

```
IntSlider(value=0, description='\\(\\int_0^t f\\)')
```

[11]:
```
r=widgets.FloatSlider(min=1, max=4, step=0.02, value=3.08,␣
 ↪continuous_update=True, description='$r$'),
steps=widgets.IntSlider(min=2, max=500, step=1, value=20,␣
 ↪continuous_update=True, description='$n_{max}$'),
x0=widgets.FloatSlider(min=0.1, max=1.0, step=0.1, value=0.1,␣
 ↪continuous_update=True, description='$x_0$'),

x0
```

[11]:
```
(FloatSlider(value=0.1, description='$x_0$', max=1.0, min=0.1),)
```