$Goal: Inferential\ statistics$

$we\ will\ find\ the\ sample\ mean\ and\ estimate\ population\ mean$

$our\ main\ goal\ to\ capture\ the\ poulation\ mean$

$assume\ that\ an\ example:$

$Naresh\ IT\ DS\ students\ pacakge\ on\ of\ average = 10LPA$

$he\ will\ take\ the\ student\ data = sample$

$calculate\ sample\ mean = 8lpa$

Point estimate:

$the\ value\ we\ are\ calcualting\ from\ a\ sample\ is\ called\ as\ Point\ estimate$

$point\ means\ a\ single\ value$

$but\ this\ point\ estimates\ might\ be\ equal\ or\ might\ not\ be\ equal\ to\ population\ value$

Interval estimate

- $our\ main\ goal\ capture\ the\ population\ mean\ based\ on\ sample\ mean$
- $this\ sample\ mean\ called\ as\ Point\ estimate\ \ (PE)$
- $PE\ is\ not\ capture\ the\ population\ mean$
- $so\ construct\ the\ Interval\ arount\ the\ Point\ estimate\ is\ called\ as\ Interval\ estimate$

$$\boldsymbol{IE = PE \pm\ z^*\ SE}$$

Confidance Intervals

One we are construct a Interval , It gives how much we are confidnace to capture the popuation

$$90\%\ CI = \boldsymbol{PE \pm\ 1.645\ SE}$$

$$95\%\ CI = \boldsymbol{PE \pm\ 1.96\ SE}$$

$$99\%\ CI = \boldsymbol{PE \pm\ 2.58\ SE}$$

$\mathbf{90-95-99}$

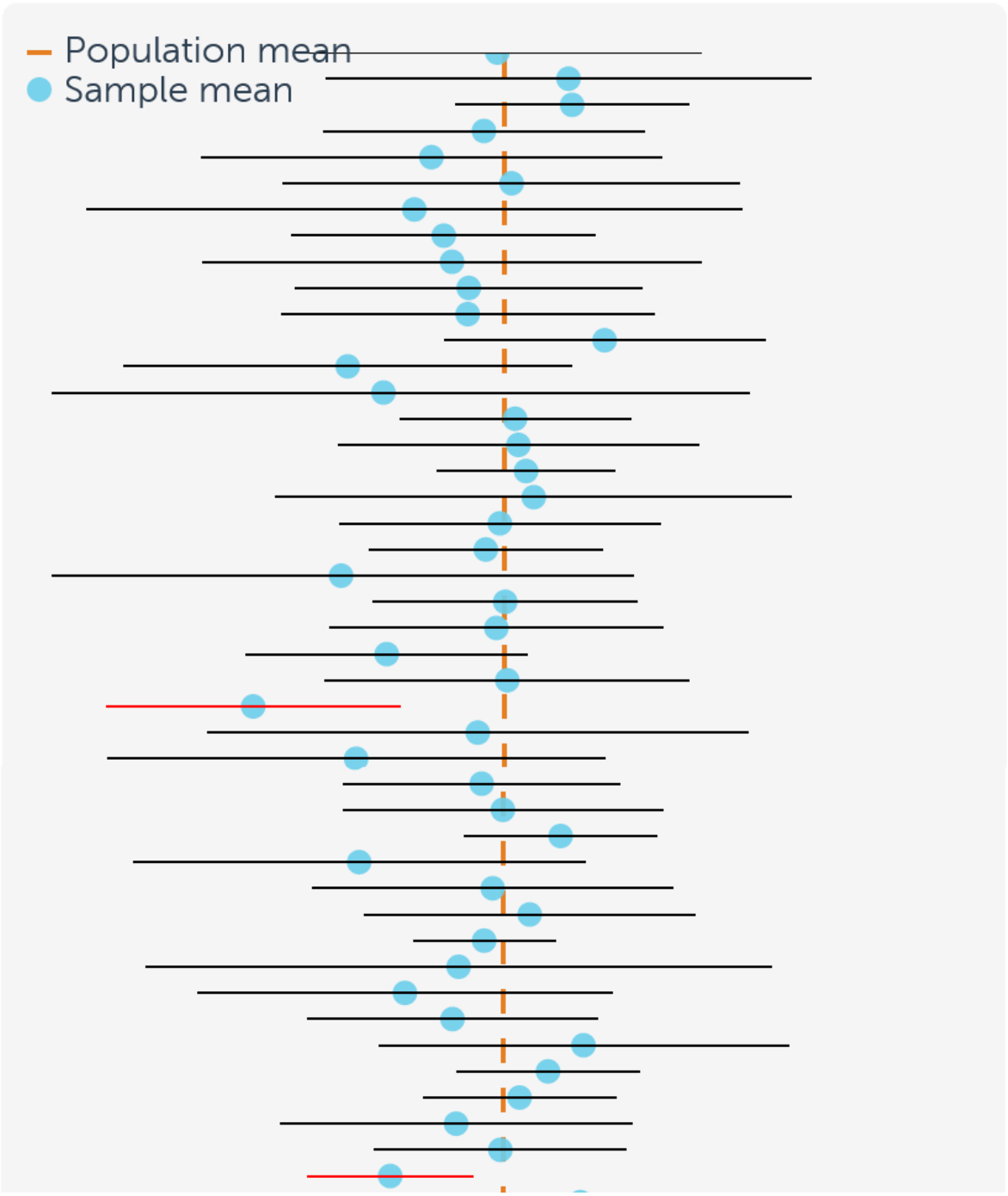
$$z = 1.645 \ ==== 90$$

$$z = 1.96 \ ==== 95$$

$$z = 2.58 \ ==== 99$$

$Emperical\ Rule(68-95-99.7)$	$CI(90-95-99)$
$\mathbf{68 = u \pm \ 1 \ Sd}$	$90 = \bar{x} \pm \ \mathbf{1.645 \ SE}$
$\mathbf{95 = u \pm \ 2 \ Sd}$	$95 = \bar{x} \pm \ \mathbf{1.96 \ SE}$
$\mathbf{99 = u \pm \ 3 \ Se}$	$99 = \bar{x} \pm \ \mathbf{2.58 \ SE}$

95% confidence intervals



How to calculate CI

using the z table

z table looks like a dataframe

- ***index***
- ***column***
- ***data values***

$Case-1: 90\%\ CI$

90% ***area under the curve***

in $z-$ ***table the data values are not capture area***

90% ***means*** $= 100 - 90 = 10\%$

10% ***means*** 0.10 ***area not capturing***

look for a value $= 0.10$ ***in z table***

index $= 1.6$

column $= 0.04$ ***and*** 0.05 , ***between*** 0.10 ***avaiable***

0.04 ***between*** $0.05 = 0.045$

final asnwer $= 1.6 + 0.045 = 1.645$

$Case-2: 95\%\ CI$

95% ***area under the curve***

in $z-$ ***table the data values are not capture area***

95% ***means*** $= 100 - 95 = 5\%$

5% ***means*** 0.05 ***area not capturing***

look for a value $= 0.05$ ***in z table***

index $= 1.9$

column $= 0.06$, ***between*** 0.05 ***avaiable***

final asnwer $= 1.9 + 0.06 = 1.96$

$Case-3: 99\%\ CI$

99% ***area under the curve***

in $z-$ ***table the data values are not capture area***

99% ***means*** $= 100 - 99 = 1\%$

1% ***means*** 0.010 ***area not capturing***

$$look\ for\ a\ value = 0.010\ in\ z\ table$$

$$index = 2.5$$

$$column = 0.07\ and\ 0.08, between\ 0.010\ avaiable$$

Type equation here.

$$final\ asnwer = 2.5 + 0.08 = 2.58$$