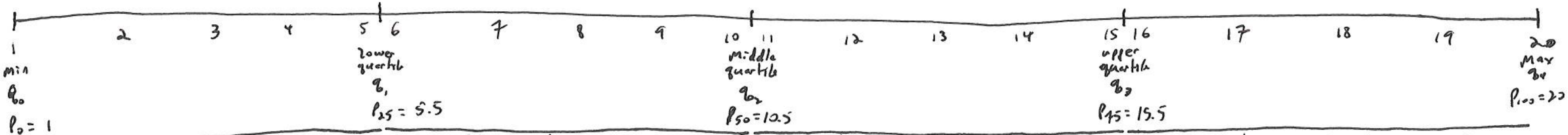

lower quarter sample ($range_{10}$)

$LQR = p_{25} - p_0 = 5.5 - 1 = 4.5$

lower middle quarter sample ($range_{21}$)

$LMQR = p_{50} - p_{25} = 10.5 - 5.5 = 5$

upper middle quarter sample ($range_{32}$)

$UMQR = p_{75} - p_{50} = 15.5 - 10.5 = 5$

upper quarter sample ($range_{43}$)

$UQR = p_{100} - p_{75} = 20 - 15.5 = 4.5$

lower half sample ($range_{20}$)

$LHR = p_{50} - p_0 = 10.5 - 1 = 9.5$

upper half sample ($range_{42}$)

$UHR = p_{100} - p_{50} = 20 - 10.5 = 9.5$

middle half sample ($range_{31}$)

$IQR = MHR = p_{75} - p_{25} = 15.5 - 5.5 = 10$

lower three quarter sample ($range_{30}$)

$L3/4R = p_{75} - p_0 = 15.5 - 1 = 14.5$

upper 3/4 sample ($range_{41}$)

$U3/4R = p_{100} - p_{25} = 20 - 5.5 = 14.5$

total sample ($range_{40}$)

$R = p_{100} - p_0 = 20 - 1 = 19$

data = (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20) n = sample size = 20

"visualizing sample percentiles"

notation

p → percentile

q → quartile

$1 \times 25 = 25$

$q_1 = p_{25}$ → lower quartile → 25th percentile

$2 \times 25 = 50$

$q_2 = p_{50}$ → median → middle or 2nd quartile → 50th percentile

ranges

$range_{10} = LQR = p_{25} - p_0$

$range_{20} = LHR = p_{50} - p_0$

$range_{30} = L3/4R = p_{75} - p_0$

$range_{21} = LMQR = p_{50} - p_{25}$

$range_{31} = MHR = IQR = p_{75} - p_{25}$

$range_{41} = U3/4R = p_{100} - p_{25}$

$range_{32} = UMQR = p_{75} - p_{50}$

$range_{42} = UHR = p_{100} - p_{50}$

$range_{40} = p_{100} - p_0$

$range_{43} = UQR = p_{100} - p_{75}$

$3 \times 25 = 75$

$q_3 = p_{75}$ = upper or third quartile = 75th percentile

$0 \times 25 = 0$

$q_0 = p_0$ = minimum = 0th percentile

$4 \times 25 = 100$

$q_4 = p_{100}$ = maximum = 100th percentile