

Estimating the Median for Grouped Data

Group	Freq	Running Total
$0 \leq h < 10$	10	10
$10 \leq h < 30$	15	25
$30 \leq h < 40$	24	49
$40 \leq h < 60$	36	85
$60 \leq h < 100$	35	120
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	120	

Median = 60^{th} or 60.5^{th} data item

Taking Median to be 60^{th} item then it would be the 11^{th} item in interval $40 \leq h < 60$

We want to be $\frac{11}{36}$ of the way through interval $40 \leq h < 60$

$$\text{Median} = 40 + \frac{11}{36} \times 20$$

$$\begin{aligned} & (\text{start of interval} + \frac{11}{36} \text{ of the interval width}) \\ & = 46.1 \end{aligned}$$

Exercise Estimate the median

Group	Freq	c.f.
$0 < h \leq 20$	24	24
$20 < h \leq 50$	35	59
$50 < h \leq 100$	51	110

$100 < h \leq 120$	64	174	Median Group
$120 < h \leq 150$	32	206	
$150 < h \leq 180$	23	229	
	<u>229</u>		

Median is item $\frac{229+1}{2} = 115^{\text{th}}$

$$\text{Est for Median} = 100 + \frac{5}{64} \times 20 = 101.6$$
