Exercise 3C.1

A small sample of undergraduate students was randomly selected from a chemistry course. Their GPAs were recorded and are shown below. Use these data to calculate the requested summary measures.

GPAs: 3.08, 2.5, 3.33, 3.75, 3.1, 2.64

(a) Standard deviation

ANSWER: 0.456

Mean: $\bar{x} = 3.07$ *(calculated in Practice Exercise 3B.2)*

x_i	$x_i - \bar{x}$	$(x_i - \bar{x})^2$
3.08	*0.01*	*0.0001*
2.5	*-0.57*	*0.3249*
3.33	*0.26*	*0.0676*
3.75	*0.68*	*0.4624*
3.1	*0.03*	*0.0009*
2.64	*-0.43*	*0.1849*
	Sum:	*1.0408*
	Divide by 5 to get s^2*:*	*0.208*
	$s = \sqrt{s^2}$*:*	*0.456*

(b) Coefficient of variation

ANSWER: 0.149

Mean: $\bar{x} = 3.07$ *(calculated in Practice Exercise 3B.2)*
Standard deviation: $s = 0.456$ *(part (a) above)*

$$cv = \frac{s}{\bar{x}} = \frac{0.456}{3.07} = 0.149$$

(c) 75th percentile

ANSWER: 3.33

Sort data values: 2.5, 2.64, 3.08, 3.1, 3.33, 3.75
$nk/100 = 6 \times 75/100 = 4.5 =$ *not an integer, so round up to next integer* $\rightarrow$ *5*
5th observation (in order) $=$ *3.33*