Quartiles, Deciles and Percentiles

Data Science and A.I. Lecture Series

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From the following data compute the values of quartiles.

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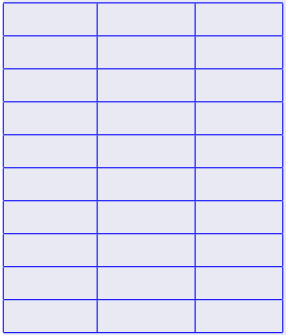
C.I.	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
f_i	5	6	15	10	5	4	2	1



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C.I.		
5-10		
10-15		
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f_i	5	6	15	10	5	4	2	1

C.I.	f_i	
5-10	5	
10-15	6	
15-20	15	
20-25	10	
25-30	5	
30-35	4	
35-40	2	
40-45	1	

From the following data compute the values of quartiles.

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C.I.	f_i	
5-10	5	
10-15	6	
15-20	15	
20-25	10	
25-30	5	
30-35	4	
35-40	2	
40-45	1	
	N=48	

From the following data compute the values of quartiles.

C.I.	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
f_i	5	6	15	10	5	4	2	1

C.I.	f_i	C. F.
5-10	5	
10-15	6	
15-20	15	
20-25	10	
25-30	5	
30-35	4	
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5-10	5	5
10-15	6	
15-20	15	
20-25	10	
25-30	5	
30-35	4	
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f_i	5	6	15	10	5	4	2	1

C.I.	f_i	C. F.
5-10	5	5
10-15	6	11
15-20	15	
20-25	10	
25-30	5	
30-35	4	
35-40	2	
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C.I.	f_i	C. F.
5-10	5	5
10-15	6	11
15-20	15	26
20-25	10	
25-30	5	
30-35	4	
35-40	2	
40-45	1	
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C.I.	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
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C.I.	f_i	C. F.
5-10	5	5
10-15	6	11
15-20	15	26
20-25	10	36
25-30	5	
30-35	4	
35-40	2	
40-45	1	
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From the following data compute the values of quartiles.

C.I.	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
f_i	5	6	15	10	5	4	2	1

C.I.	f_i	C. F.
5-10	5	5
10-15	6	11
15-20	15	26
20-25	10	36
25-30	5	41
30-35	4	
35-40	2	
40-45	1	
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f_i	5	6	15	10	5	4	2	1

C.I.	f_i	C. F.
5-10	5	5
10-15	6	11
15-20	15	26
20-25	10	36
25-30	5	41
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C.I.	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
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C.I.	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
f_i	5	6	15	10	5	4	2	1

Computing Q_1 :

C.I.	f_i	C. F.
5-10	5	5
10-15	6	11
15-20	15	26
20-25	10	36
25-30	5	41
30-35	4	45
35-40	2	47
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C.I.	f_i	C. F.
5-10	5	5
10-15	6	11
15-20	15	26
20-25	10	36
25-30	5	41
30-35	4	45
35-40	2	47
40-45	1	48
	N=48	

Computing Q_1 :
We have, $\frac{N}{4} = \frac{48}{4} = 12$

From the following data compute the values of quartiles.

C.I.	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
f_i	5	6	15	10	5	4	2	1

C.I.	f_i	C. F.
5-10	5	5
10-15	6	11
15-20	15	26
20-25	10	36
25-30	5	41
30-35	4	45
35-40	2	47
40-45	1	48
	N=48	

Computing Q_1 :
We have, $\frac{N}{4} = \frac{48}{4} = 12$
Cumulative frequency just greater than 12 is 26, and the corresponding lower quartile Q_1 class is 15-20, such that
l=15,f=15,h=5,F=11

From the following data compute the values of quartiles.

C.I.	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
f_i	5	6	15	10	5	4	2	1

C.I.	f_i	C. F.
5-10	5	5
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15-20	15	26
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25-30	5	41
30-35	4	45
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We have, $\frac{N}{4} = \frac{48}{4} = 12$
Cumulative frequency just greater than 12 is 26, and the corresponding lower quartile Q_1 class is 15-20, such that
l=15,f=15,h=5,F=11
Lower Quartile
$Q_1 = l + \frac{\frac{N}{4}-F}{f} x h$

From the following data compute the values of quartiles.

C.I.	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
f_i	5	6	15	10	5	4	2	1

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5-10	5	5
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We have, $\frac{N}{4} = \frac{48}{4} = 12$
Cumulative frequency just greater than 12 is 26, and the corresponding lower quartile Q_1 class is 15-20, such that
l=15,f=15,h=5,F=11
Lower Quartile
$Q_1 = l + \frac{\frac{N}{4} - F}{f} x h$
$Q_1 = 15 + \frac{12-11}{15} x 5$

From the following data compute the values of quartiles.

C.I.	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
f_i	5	6	15	10	5	4	2	1

C.I.	f_i	C. F.
5-10	5	5
10-15	6	11
15-20	15	26
20-25	10	36
25-30	5	41
30-35	4	45
35-40	2	47
40-45	1	48
	N=48	

Computing Q_1 :
We have, $\frac{N}{4} = \frac{48}{4} = 12$
Cumulative frequency just greater than 12 is 26, and the corresponding lower quartile Q_1 class is 15-20, such that
l=15,f=15,h=5,F=11
Lower Quartile

$$Q_1 = l + \frac{\frac{N}{4} - F}{f} x h$$

$$Q_1 = 15 + \frac{12-11}{15} x 5$$

$$Q_1 = 15.33$$

From the following data compute the values of quartiles.

C.I.	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
f_i	5	6	15	10	5	4	2	1

C.I.	f_i	C. F.
5-10	5	5
10-15	6	11
15-20	15	26
20-25	10	36
25-30	5	41
30-35	4	45
35-40	2	47
40-45	1	48
	N=48	

Computing Q_1 :
We have, $\frac{N}{4} = \frac{48}{4} = 12$
Cumulative frequency just greater than 12 is 26, and the corresponding lower quartile Q_1 class is 15-20, such that
l=15,f=15,h=5,F=11
Lower Quartile
$Q_1 = l + \frac{\frac{N}{4} - F}{f} x h$
$Q_1 = 15 + \frac{12-11}{15} x 5$
$Q_1 = 15.33$

Computing Q_2(Median):

From the following data compute the values of quartiles.

C.I.	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
f_i	5	6	15	10	5	4	2	1

C.I.	f_i	C. F.
5-10	5	5
10-15	6	11
15-20	15	26
20-25	10	36
25-30	5	41
30-35	4	45
35-40	2	47
40-45	1	48
	N=48	

Computing Q_1 :
We have, $\frac{N}{4} = \frac{48}{4} = 12$
Cumulative frequency just greater than 12 is 26, and the corresponding lower quartile Q_1 class is 15-20, such that
l=15,f=15,h=5,F=11
Lower Quartile
$Q_1 = l + \frac{\frac{N}{4} - F}{f} x h$
$Q_1 = 15 + \frac{12-11}{15} x 5$
$Q_1 = 15.33$

Computing Q_2(Median):
We have, $\frac{N}{2} = \frac{48}{2} = 24$

From the following data compute the values of quartiles.

C.I.	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
f_i	5	6	15	10	5	4	2	1

C.I.	f_i	C. F.
5-10	5	5
10-15	6	11
15-20	15	26
20-25	10	36
25-30	5	41
30-35	4	45
35-40	2	47
40-45	1	48
	N=48	

Computing Q_1 :
We have, $\frac{N}{4} = \frac{48}{4} = 12$
Cumulative frequency just greater than 12 is 26, and the corresponding lower quartile Q_1 class is 15-20, such that
l=15,f=15,h=5,F=11
Lower Quartile

$$Q_1 = l + \frac{\frac{N}{4} - F}{f} x h$$

$$Q_1 = 15 + \frac{12-11}{15} x 5$$

$$Q_1 = 15.33$$

Computing Q_2(Median):
We have, $\frac{N}{2} = \frac{48}{2} = 24$
Cumulative frequency just greater than 24 is 26, and the corresponding middle quartile class is 15-20, such that
l=15,f=15,h=5,F=11.

From the following data compute the values of quartiles.

C.I.	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
f_i	5	6	15	10	5	4	2	1

C.I.	f_i	C. F.
5-10	5	5
10-15	6	11
15-20	15	26
20-25	10	36
25-30	5	41
30-35	4	45
35-40	2	47
40-45	1	48
	N=48	

Computing Q_1 :
We have, $\frac{N}{4} = \frac{48}{4} = 12$
Cumulative frequency just greater than 12 is 26, and the corresponding lower quartile Q_1 class is 15-20, such that
l=15,f=15,h=5,F=11
Lower Quartile
$Q_1 = l + \frac{\frac{N}{4} - F}{f} xh$
$Q_1 = 15 + \frac{12-11}{15} x5$
$Q_1 = 15.33$

Computing Q_2(Median):
We have, $\frac{N}{2} = \frac{48}{2} = 24$
Cumulative frequency just greater than 24 is 26, and the corresponding middle quartile class is 15-20, such that
l=15,f=15,h=5,F=11.
Middle Quartile
$Q_2 = l + \frac{\frac{N}{2} - F}{f} xh$

From the following data compute the values of quartiles.

C.I.	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
f_i	5	6	15	10	5	4	2	1

C.I.	f_i	C. F.
5-10	5	5
10-15	6	11
15-20	15	26
20-25	10	36
25-30	5	41
30-35	4	45
35-40	2	47
40-45	1	48
	N=48	

Computing Q_1 :
We have, $\frac{N}{4} = \frac{48}{4} = 12$
Cumulative frequency just greater than 12 is 26, and the corresponding lower quartile Q_1 class is 15-20, such that
l=15,f=15,h=5,F=11
Lower Quartile

$$Q_1 = l + \frac{\frac{N}{4} - F}{f} xh$$

$$Q_1 = 15 + \frac{12-11}{15} x5$$

$$Q_1 = 15.33$$

Computing Q_2(Median):
We have, $\frac{N}{2} = \frac{48}{2} = 24$
Cumulative frequency just greater than 24 is 26, and the corresponding middle quartile class is 15-20, such that
l=15,f=15,h=5,F=11.
Middle Quartile

$$Q_2 = l + \frac{\frac{N}{2} - F}{f} xh$$

$$Q_2 = 15 + \frac{24-11}{10} x5$$

From the following data compute the values of quartiles.

C.I.	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
f_i	5	6	15	10	5	4	2	1

C.I.	f_i	C. F.
5-10	5	5
10-15	6	11
15-20	15	26
20-25	10	36
25-30	5	41
30-35	4	45
35-40	2	47
40-45	1	48
	N=48	

Computing Q_1 :
We have, $\frac{N}{4} = \frac{48}{4} = 12$
Cumulative frequency just greater than 12 is 26, and the corresponding lower quartile Q_1 class is 15-20, such that
l=15,f=15,h=5,F=11
Lower Quartile

$$Q_1 = l + \frac{\frac{N}{4} - F}{f} xh$$
$$Q_1 = 15 + \frac{12-11}{15} x5$$
$$Q_1 = 15.33$$

Computing Q_2(Median):
We have, $\frac{N}{2} = \frac{48}{2} = 24$
Cumulative frequency just greater than 24 is 26, and the corresponding middle quartile class is 15-20, such that
l=15,f=15,h=5,F=11.
Middle Quartile

$$Q_2 = l + \frac{\frac{N}{2} - F}{f} xh$$
$$Q_2 = 15 + \frac{24-11}{10} x5$$
$$Q_2 = 21.50$$

From the following data compute the values of quartiles.

C.I.	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
f_i	5	6	15	10	5	4	2	1

C.I.	f_i	C. F.
5-10	5	5
10-15	6	11
15-20	15	26
20-25	10	36
25-30	5	41
30-35	4	45
35-40	2	47
40-45	1	48
	N=48	

Computing Q_1 :
We have, $\frac{N}{4} = \frac{48}{4} = 12$
Cumulative frequency just greater than 12 is 26, and the corresponding lower quartile Q_1 class is 15-20, such that
l=15,f=15,h=5,F=11
Lower Quartile

$$Q_1 = l + \frac{\frac{N}{4} - F}{f} x h$$
$$Q_1 = 15 + \frac{12-11}{15} x 5$$
$$Q_1 = 15.33$$

Computing Q_2(Median):
We have, $\frac{N}{2} = \frac{48}{2} = 24$
Cumulative frequency just greater than 24 is 26, and the corresponding middle quartile class is 15-20, such that
l=15,f=15,h=5,F=11.
Middle Quartile

$$Q_2 = l + \frac{\frac{N}{2} - F}{f} x h$$
$$Q_2 = 15 + \frac{24-11}{10} x 5$$
$$Q_2 = 21.50$$

Computing Q_3:

From the following data compute the values of quartiles.

C.I.	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
f_i	5	6	15	10	5	4	2	1

C.I.	f_i	C. F.
5-10	5	5
10-15	6	11
15-20	15	26
20-25	10	36
25-30	5	41
30-35	4	45
35-40	2	47
40-45	1	48
	N=48	

Computing Q_1 :
We have, $\frac{N}{4} = \frac{48}{4} = 12$
Cumulative frequency just greater than 12 is 26, and the corresponding lower quartile Q_1 class is 15-20, such that
l=15,f=15,h=5,F=11
Lower Quartile

$$Q_1 = l + \frac{\frac{N}{4} - F}{f} xh$$
$$Q_1 = 15 + \frac{12-11}{15} x5$$
$$Q_1 = 15.33$$

Computing Q_2(Median):
We have, $\frac{N}{2} = \frac{48}{2} = 24$
Cumulative frequency just greater than 24 is 26, and the corresponding middle quartile class is 15-20, such that
l=15,f=15,h=5,F=11.
Middle Quartile

$$Q_2 = l + \frac{\frac{N}{2} - F}{f} xh$$
$$Q_2 = 15 + \frac{24-11}{10} x5$$
$$Q_2 = 21.50$$

Computing Q_3:
We have,
$\frac{3N}{4} = \frac{3x48}{4} = 36$

From the following data compute the values of quartiles.

C.I.	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
f_i	5	6	15	10	5	4	2	1

C.I.	f_i	C. F.
5-10	5	5
10-15	6	11
15-20	15	26
20-25	10	36
25-30	5	41
30-35	4	45
35-40	2	47
40-45	1	48
	N=48	

Computing Q_1 :
We have, $\frac{N}{4} = \frac{48}{4} = 12$
Cumulative frequency just greater than 12 is 26, and the corresponding lower quartile Q_1 class is 15-20, such that l=15,f=15,h=5,F=11
Lower Quartile
$Q_1 = l + \frac{\frac{N}{4}-F}{f} xh$
$Q_1 = 15 + \frac{12-11}{15} x5$
$Q_1 = 15.33$

Computing Q_2(Median):
We have, $\frac{N}{2} = \frac{48}{2} = 24$
Cumulative frequency just greater than 24 is 26, and the corresponding middle quartile class is 15-20, such that l=15,f=15,h=5,F=11.
Middle Quartile
$Q_2 = l + \frac{\frac{N}{2}-F}{f} xh$
$Q_2 = 15 + \frac{24-11}{10} x5$
$Q_2 = 21.50$

Computing Q_3:
We have,
$\frac{3N}{4} = \frac{3x48}{4} = 36$
Cumulative frequency just greater than 36 is 41, and the corresponding upper quartile $Q3$ class is 25-30, such that l=25,f=5,h=5,F=36.

From the following data compute the values of quartiles.

C.I.	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
f_i	5	6	15	10	5	4	2	1

C.I.	f_i	C. F.
5-10	5	5
10-15	6	11
15-20	15	26
20-25	10	36
25-30	5	41
30-35	4	45
35-40	2	47
40-45	1	48
	N=48	

Computing Q_1 :
We have, $\frac{N}{4} = \frac{48}{4} = 12$
Cumulative frequency just greater than 12 is 26, and the corresponding lower quartile Q_1 class is 15-20, such that
l=15,f=15,h=5,F=11
Lower Quartile
$Q_1 = l + \frac{\frac{N}{4}-F}{f} xh$
$Q_1 = 15 + \frac{12-11}{15} x5$
$Q_1 = 15.33$

Computing Q_2(Median):
We have, $\frac{N}{2} = \frac{48}{2} = 24$
Cumulative frequency just greater than 24 is 26, and the corresponding middle quartile class is 15-20, such that
l=15,f=15,h=5,F=11.
Middle Quartile
$Q_2 = l + \frac{\frac{N}{2}-F}{f} xh$
$Q_2 = 15 + \frac{24-11}{10} x5$
$Q_2 = 21.50$

Computing Q_3:
We have,
$\frac{3N}{4} = \frac{3x48}{4} = 36$
Cumulative frequency just greater than 36 is 41, and the corresponding upper quartile $Q3$ class is 25-30, such that
l=25,f=5,h=5,F=36.
Upper Quartile
$Q_3 = l + \frac{\frac{3N}{4}-F}{f} xh$

From the following data compute the values of quartiles.

C.I.	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
f_i	5	6	15	10	5	4	2	1

C.I.	f_i	C. F.
5-10	5	5
10-15	6	11
15-20	15	26
20-25	10	36
25-30	5	41
30-35	4	45
35-40	2	47
40-45	1	48
	N=48	

Computing Q_1 :
We have, $\frac{N}{4} = \frac{48}{4} = 12$
Cumulative frequency just greater than 12 is 26, and the corresponding lower quartile Q_1 class is 15-20, such that
l=15,f=15,h=5,F=11
Lower Quartile
$Q_1 = l + \frac{\frac{N}{4} - F}{f} xh$
$Q_1 = 15 + \frac{12-11}{15} x5$
$Q_1 = 15.33$

Computing Q_2(Median):
We have, $\frac{N}{2} = \frac{48}{2} = 24$
Cumulative frequency just greater than 24 is 26, and the corresponding middle quartile class is 15-20, such that
l=15,f=15,h=5,F=11.
Middle Quartile
$Q_2 = l + \frac{\frac{N}{2} - F}{f} xh$
$Q_2 = 15 + \frac{24-11}{10} x5$
$Q_2 = 21.50$

Computing Q_3:
We have,
$\frac{3N}{4} = \frac{3x48}{4} = 36$
Cumulative frequency just greater than 36 is 41, and the corresponding upper quartile $Q3$ class is 25-30, such that
l=25,f=5,h=5,F=36.
Upper Quartile
$Q_3 = l + \frac{\frac{3N}{4} - F}{f} xh$
$Q_3 = 25 + \frac{36-36}{5} x5$

From the following data compute the values of quartiles.

C.I.	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
f_i	5	6	15	10	5	4	2	1

C.I.	f_i	C. F.
5-10	5	5
10-15	6	11
15-20	15	26
20-25	10	36
25-30	5	41
30-35	4	45
35-40	2	47
40-45	1	48
	N=48	

Computing Q_1 :
We have, $\frac{N}{4} = \frac{48}{4} = 12$
Cumulative frequency just greater than 12 is 26, and the corresponding lower quartile Q_1 class is 15-20, such that
l=15,f=15,h=5,F=11
Lower Quartile
$Q_1 = l + \frac{\frac{N}{4} - F}{f} xh$
$Q_1 = 15 + \frac{12-11}{15} x5$
$Q_1 = 15.33$

Computing Q_2(Median):
We have, $\frac{N}{2} = \frac{48}{2} = 24$
Cumulative frequency just greater than 24 is 26, and the corresponding middle quartile class is 15-20, such that
l=15,f=15,h=5,F=11.
Middle Quartile
$Q_2 = l + \frac{\frac{N}{2} - F}{f} xh$
$Q_2 = 15 + \frac{24-11}{10} x5$
$Q_2 = 21.50$

Computing Q_3:
We have,
$\frac{3N}{4} = \frac{3x48}{4} = 36$
Cumulative frequency just greater than 36 is 41, and the corresponding upper quartile $Q3$ class is 25-30, such that
l=25,f=5,h=5,F=36.
Upper Quartile
$Q_3 = l + \frac{\frac{3N}{4} - F}{f} xh$
$Q_3 = 25 + \frac{36-36}{5} x5$
$Q_3 = 25$