	A
=	
1	x
2	n
3	conf level
4	
5	
6	
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8	
9	
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11	

A1 x

x=12 n =56 p =12/56 $=\frac{3}{14}\approx 0.214286$ q =1−0.214286 = 0.785714

confidence level =95. %=0.95 alpha =0.05 $\frac{alpha}{2}=0.025$

$$CV = z_{0.5\alpha} = \text{invnorm}(0.025,0,1) = \pm 1.95996$$

Margin of Error

$$E = CV\cdot\sqrt{\frac{p\cdot q}{n}}$$

$$=1.95996\sqrt{[(0.214286)(0.785714)/56]}$$

$$\approx 0.107469$$

confidence level $=95.\ \%=0.95$ alpha $=0.05$ $\frac{alpha}{2}=0.025$

$p=0.214286$ $\mathbf{E}\approx 0.107469$

confidence interval for p

We are 95. % confident that"p" lies in the following interval

interval notation

$(p-E,\ p+E)\ =(0.214286-0.107469,0.214286+0.107469)$

$=(0.106817,0.321755)$

conjunction notation

$p-E<p<p+E$ $0.214286-0.107469<\mathbf{p}<0.214286+0.107469$

$0.106817<\mathbf{p}<0.321755$

tolerance notation 0.214286 ± 0.107469

	A
=	
1	x
2	n
3	conf level
4	
5	
6	
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8	
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11	

A1 x

x=12 n =20 p =12/20 $=\frac{3}{5}\approx 0.6$ q =1−0.6 = 0.4

confidence level =95. %=0.95 alpha =0.05 $\frac{alpha}{2}=0.025$

CV = $z_{0.5\alpha}$ =invnorm(0.025,0,1) =±1.95996

Margin of Error

$$E=CV\cdot\sqrt{\frac{p\cdot q}{n}}$$

$$=1.95996\sqrt{[(0.6)(0.4)/20]}$$

$$\approx 0.214703$$

confidence level $=95.\ \%=0.95$ alpha $=0.05$ $\frac{alpha}{2}=0.025$

$p=0.6$ $\mathbf{E}\approx 0.214703$

confidence interval for p

We are 95. % confident that"p" lies in the following interval

interval notation

$(p-E,\ p+E)\ =(0.6-0.214703,0.6+0.214703)$

$=(0.385297,0.814703)$

conjunction notation

$p-E<p<p+E$ $0.6-0.214703<\mathbf{p}<0.6+0.214703$

$0.385297<\mathbf{p}<0.814703$

tolerance notation 0.6 ± 0.214703

	A
=	
1	x
2	n
3	conf level
4	
5	
6	
7	
8	
9	
10	
11	

A1 x

x=15 n =90 p =15 /90 $=\frac{1}{6}\approx 0.166667$ q =1−0.166667 = 0.833333

confidence level =90. %=0.9 alpha =0.1 $\frac{alpha}{2}=0.05$

CV = $z_{0.5\alpha}$ =invnorm(0.05,0,1) =±1.64485

Margin of Error

$$E=CV\cdot\sqrt{\frac{p\cdot q}{n}}$$

$$=1.64485\sqrt{[(0.166667)(0.833333)/90]}$$

$$\approx 0.064616$$

confidence level $=90.\ \%=0.9$ alpha $=0.1$ $\frac{alpha}{2}=0.05$

$p=0.166667$ $\mathbf{E}\approx 0.064616$

confidence interval for p

We are 90. % confident that"p" lies in the following interval

interval notation

$(p-E,\ p+E)\ =(0.166667-0.064616,0.166667+0.064616)$

$=(0.102051,0.231283)$

conjunction notation

$p-E<p<p+E$ $0.166667-0.064616<\mathbf{p}<0.166667+0.064616$

$0.102051<\mathbf{p}<0.231283$

tolerance notation 0.166667 ± 0.064616

	A
=	
1	x
2	n
3	conf level
4	
5	
6	
7	
8	
9	
10	
11	

A1 x

x=18 n =45 p =18/45 $=\frac{2}{5}\approx 0.4$ q =1−0.4 = 0.6

confidence level =99. %=0.99 alpha =0.01 $\frac{alpha}{2}=0.005$

CV = $z_{0.5\alpha}$ =invnorm(0.005,0,1) =±2.57583

Margin of Error

$$E=CV\cdot\sqrt{\frac{p\cdot q}{n}}$$

$$=2.57583\sqrt{[(0.4)(0.6)/45]}$$

$$\approx 0.188112$$

confidence level $=99.\ \%=0.99$ alpha $=0.01$ $\frac{alpha}{2}=0.005$

$p=0.4$ $\mathbf{E}\approx 0.188112$

confidence interval for p

We are 99. % confident that"p" lies in the following interval

interval notation

$(p-E,\ p+E)=(0.4-0.188112,0.4+0.188112)$

$=(0.211888,0.588112)$

conjunction notation

$p-E<p<p+E$ $0.4-0.188112<\mathbf{p}<0.4+0.188112$

$0.211888<\mathbf{p}<0.588112$

tolerance notation 0.4 ± 0.188112

	A
=	
1	x
2	n
3	conf level
4	
5	
6	
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8	
9	
10	
11	

A1 x

x=25 n =500 p =25 /500 $=\frac{1}{20}\approx 0.05$ q =1−0.05 = 0.95

confidence level =75. %=0.75 alpha =0.25 $\frac{alpha}{2}=0.125$

CV = $z_{0.5\alpha}$ =invnorm(0.125 ,0,1) =±1.15035

Margin of Error

$$E=CV\cdot\sqrt{\frac{p\cdot q}{n}}$$

$$=1.15035\sqrt{[(0.05)(0.95)/500]}$$

$$\approx 0.011212$$

confidence level $=75.\ \%=0.75$ alpha $=0.25$ $\frac{alpha}{2}=0.125$

$p=0.05$ $\mathbf{E}\approx 0.011212$

confidence interval for p

We are 75. % confident that"p" lies in the following interval

interval notation

$(p-E,\ p+E)\ =(0.05-0.011212,0.05+0.011212)$

$=(0.038788,0.061212)$

conjunction notation

$p-E<p<p+E$ $0.05-0.011212<\mathbf{p}<0.05+0.011212$

$0.038788<\mathbf{p}<0.061212$

tolerance notation 0.05 ± 0.011212

	A
=	
1	x
2	n
3	conf level
4	
5	
6	
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8	
9	
10	
11	

A1 x

x=12 n =200 p =12/200 $=\frac{3}{50}\approx 0.06$ q =1−0.06 = 0.94

confidence level =64. %=0.64 alpha =0.36 $\frac{alpha}{2}=0.18$

$CV = z_{0.5\alpha} = \text{invnorm}(0.18,0,1) = \pm 0.915365$

Margin of Error

$$E = CV \cdot \sqrt{\frac{p \cdot q}{n}}$$

$$= 0.915365\sqrt{[(0.06)(0.94)/200]}$$

$$\approx 0.015372$$

confidence level $=64.\ \%=0.64$ alpha $=0.36$ $\frac{alpha}{2}=0.18$

$p=0.06$ $\mathbf{E}\approx 0.015372$

confidence interval for p

We are 64. % confident that"p" lies in the following interval

interval notation

$(p-E,\ p+E)\ =(0.06-0.015372,0.06+0.015372)$

$=(0.044628,0.075372)$

conjunction notation

$p-E<p<p+E$ $0.06-0.015372<\mathbf{p}<0.06+0.015372$

$0.044628<\mathbf{p}<0.075372$

tolerance notation 0.06 ± 0.015372

	A
=	
1	x
2	n
3	conf level
4	
5	
6	
7	
8	
9	
10	
11	

A1 x

x=48 n =500 p =48 /500 $=\frac{12}{125}\approx 0.096$ q =1−0.096 = 0.904

confidence level =85. %=0.85 alpha =0.15 $\frac{alpha}{2}=0.075$

CV = $z_{0.5\alpha}$ =invnorm(0.075 ,0,1) =±1.43953

Margin of Error

$$E=CV\cdot\sqrt{\frac{p\cdot q}{n}}$$

$$=1.43953\sqrt{[(0.096)(0.904)/500]}$$

$$\approx 0.018965$$

confidence level $=85.\ \%=0.85$ alpha $=0.15$ $\frac{alpha}{2}=0.075$

$p=0.096$ $\mathbf{E}\approx 0.018965$

confidence interval for p

We are 85. % confident that"p" lies in the following interval

interval notation

$(p-E,\ p+E)\ =(0.096-0.018965,0.096+0.018965)$

$=(0.077035,0.114965)$

conjunction notation

$p-E<p<p+E$ $0.096-0.018965<\mathbf{p}<0.096+0.018965$

$0.077035<\mathbf{p}<0.114965$

tolerance notation 0.096 ± 0.018965