

6	9	13	7
12		10	5
3	1	4	14
15	8	11	2

Bogus Induction

Albert R Meyer
February 24, 2012
lec 3F.1


6	9	13	7
12		10	5
3	1	4	14
15	8	11	2

A Bogus Proof

Theorem: All horses are the same color.

Proof: (by induction on n)

Induction hypothesis:
 $P(n) ::=$ any set of n horses are the same color



Albert R Meyer
February 24, 2012
lec 3F.2

6	9	13	7
12		10	5
3	1	4	14
15	8	11	2

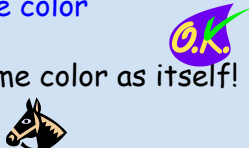
A Bogus Proof

Theorem: All horses are the same color.

Proof: (by induction on n)

Induction hypothesis:
 $P(n) ::=$ any set of n horses are the same color

Base case ($n=1$):
 horse is same color as itself!




Albert R Meyer
February 24, 2012
lec 3F.3

6	9	13	7
12		10	5
3	1	4	14
15	8	11	2

A Bogus Proof

(Inductive case): Assume n horses have the same color.

Prove that any $n+1$ horses have the same color.



Albert R Meyer
February 24, 2012
lec 3F.4


6	9	13	7
12		10	5
3	1	4	14
15	8	11	2

A Bogus Proof

(Inductive case): Assume n horses have the same color.

Prove that any $n+1$ horses have the same color.

2nd set of n horses have the same color



first set of n horses have the same color

Albert R Meyer
February 24, 2012
lec 3F.5


6	9	13	7
12		10	5
3	1	4	14
15	8	11	2

A Bogus Proof

(Inductive case): Assume n horses have the same color.

Prove that any $n+1$ horses have the same color.

2nd set of n horses have the same color



first set of n horses have the same color


Albert R Meyer
February 24, 2012
lec 3F.6

6	9	13	7
12		10	5
3	1	4	14
15	8	11	2

A Bogus Proof

1st and last 🐎 same color as the middle ones QED ?!?

so set of $n+1$ have the same color!



Albert R Meyer February 24, 2012 lec 3F.7

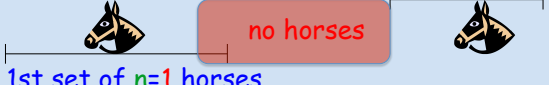
6	9	13	7
12		10	5
3	1	4	14
15	8	11	2

A Bogus Proof

What's wrong?

Proof that $P(n) \rightarrow P(n+1)$ is wrong if $n = 1$, because there are no "middle" horses!

2nd set of $n=1$ horses



1st set of $n=1$ horses


Albert R Meyer February 24, 2012 lec 3F.8

6	9	13	7
12		10	5
3	1	4	14
15	8	11	2

A Bogus Proof

What's wrong?

Proof that $P(n) \rightarrow P(n+1)$ is wrong if $n = 1$, because there are no "middle" horses!



mislead by ellipsis

Albert R Meyer February 24, 2012 lec 3F.9

6	9	13	7
12		10	5
3	1	4	14
15	8	11	2

A Bogus Proof

What's wrong?

Proof that $P(n) \rightarrow P(n+1)$ is wrong if $n = 1$, because there are no "middle" horses!

(But proof works for all $n \neq 1$)

Albert R Meyer February 24, 2012 lec 3F.10