Bayesian Statistics & Bayes' Theorem

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$p(B|A)$ = Likelihood
$p(A|B)$ = Posterior Probability
$p(A)$ = Prior Probability
$p(B)$ = Bayesian Evidence
(Marginalized Likelihood)

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A rare condition, affects 1 in 100,000 people of your demographic group. There is a test for the condition that is 98% accurate. This means that 98% of test takers who have the condition test positive (the other 2% get false negative results), and 98% of those who do not have the condition test negative (the other 2% get false positive results). You decide to take the test and receive a positive result. What is the probability you have the condition?

$$p(+) = p(+|c)\,p(c) + p(+|h)\,p(h)$$

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$$p(+) = (0.98)\left(\frac{1}{100000}\right) + (0.02)\left(\frac{99999}{100000}\right) \approx \boxed{0.02}$$

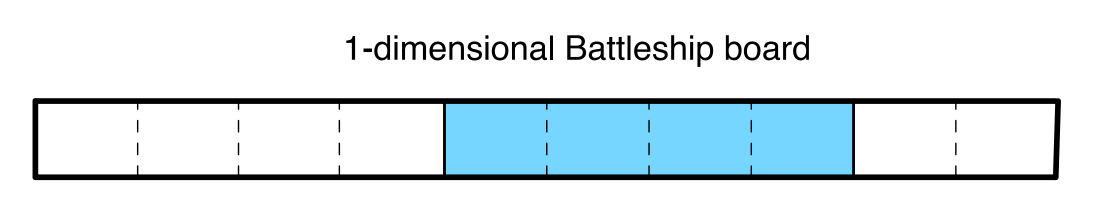
$$p(c|+) = \frac{p(c)\,p(+|c)}{p(+)} \approx \boxed{0.0005}$$

Battleship !

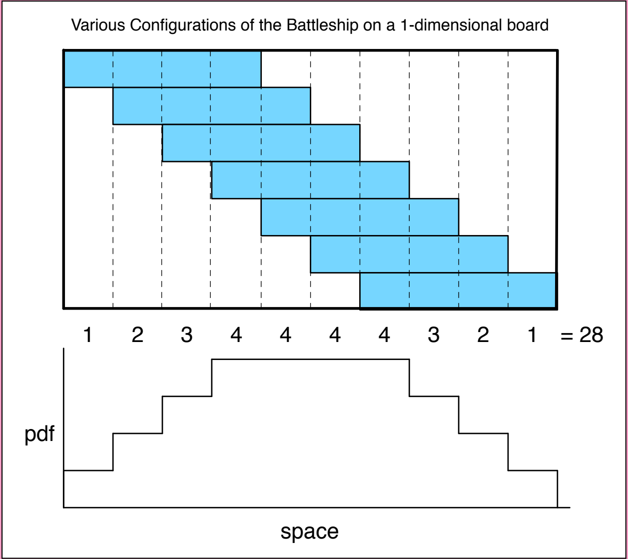

MB
Milton Bradley
BATTLESHIP
Combine Strategy And Luck
In This Exciting Naval Action Game
Ages
8 to Adult
2 Players
SET UP
YOUR FLEET
CALL OUT THE SHOTS
MARK THE HITS
SINK YOUR
OPPONENT'S
FLEET

- You set up your ships, without seeing the other player’s.
- Guess where the other player’s ships are by calling out coordinates.
- Mark hits with red markers. Sink all the other player’s ships!

1-Dimensional game of Battleship



- A 1-dimensional board is simple enough to do all of the counting.
- There are only 7 configurations (×2 if you allow flipping the battleship)



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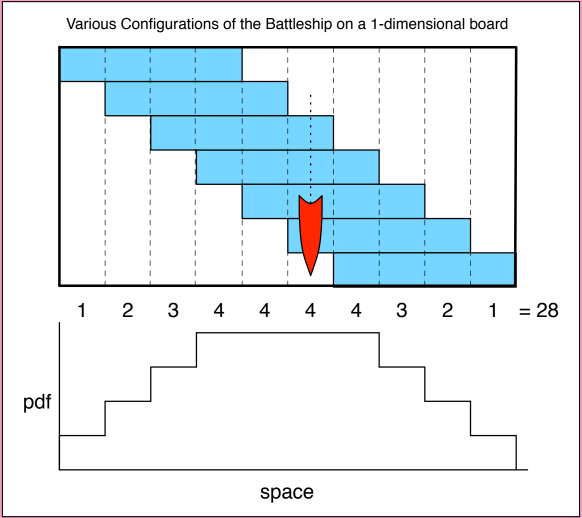

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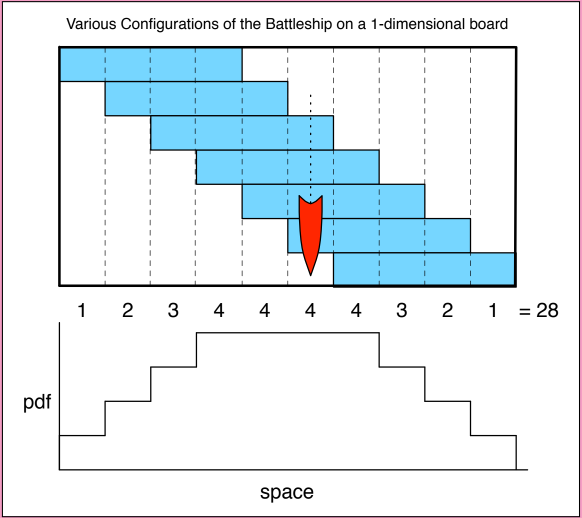

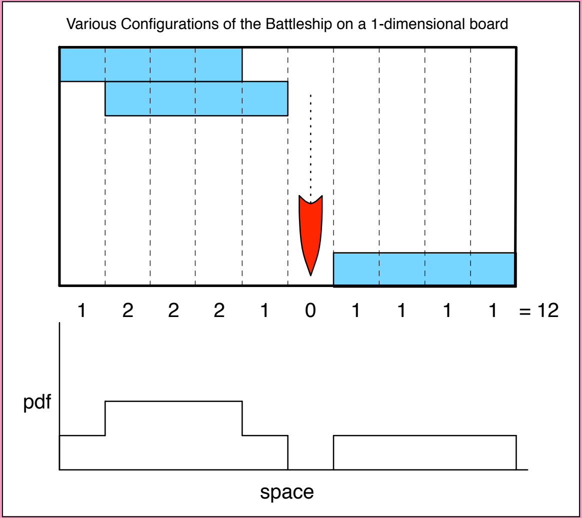

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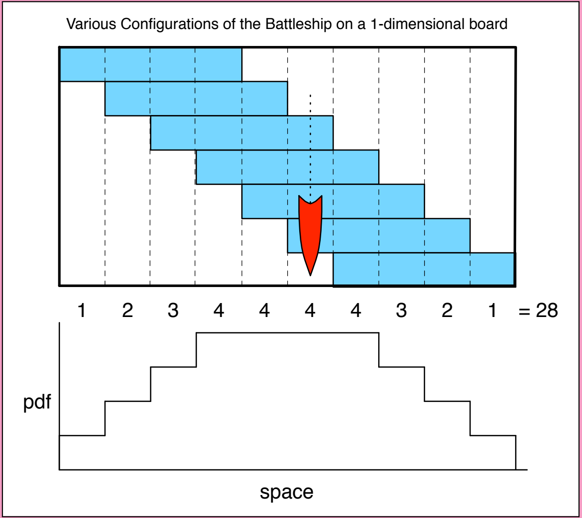

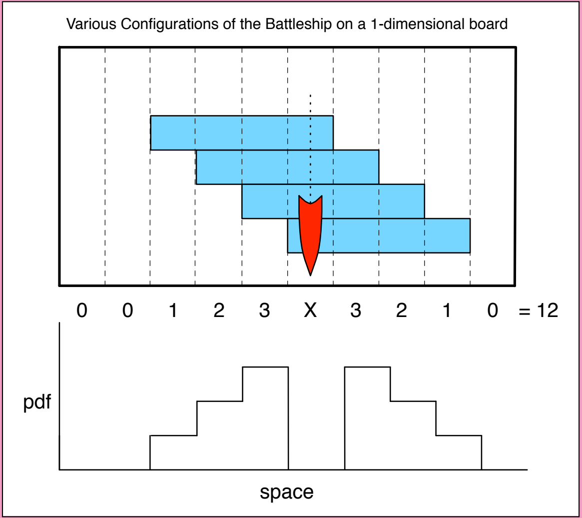

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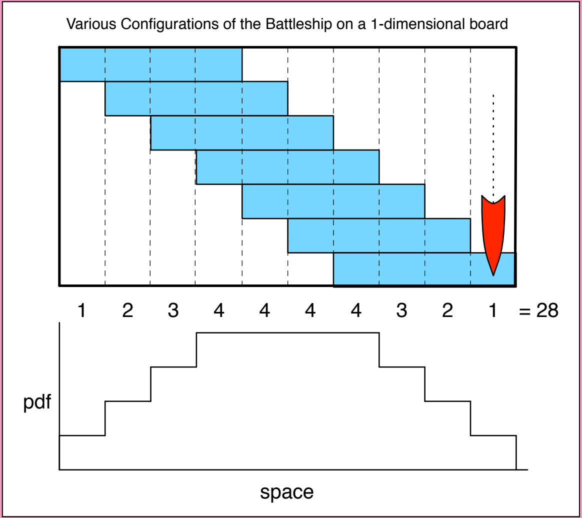

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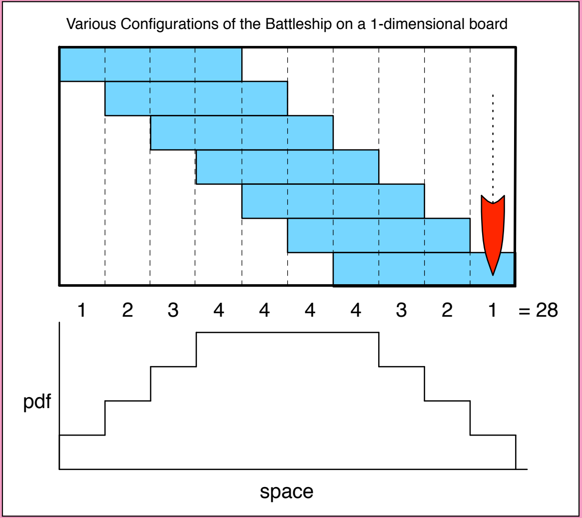

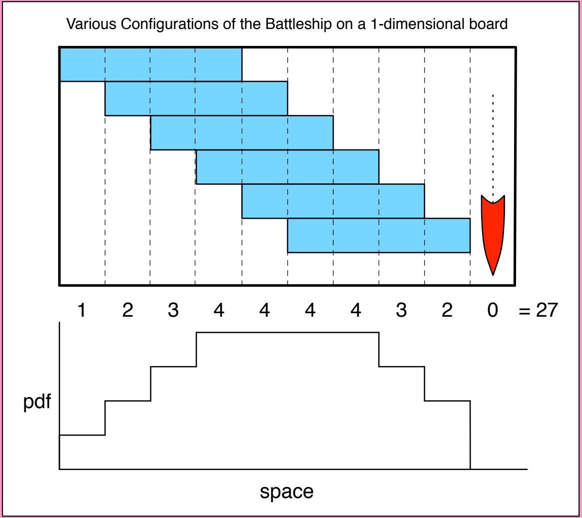

1-Dimensional game of Battleship Battleship Odds Website