

Product Association Recommenders



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People Who Like/Bought/....

The screenshot displays the Amazon product page for a Cree 100W Equivalent Soft White A21 LED Light Bulb. The page includes the following details:

- Product Title:** Cree 100W Equivalent Soft White A21 LED Light Bulb
- Price:** \$19.97 (33.99/bulb) with Prime shipping.
- Customer Reviews:** 4.5 stars from 433 reviews.
- Shipping:** One-Day Shipping available for \$2.99.
- User Account:** Joseph A. Konstan is logged in.
- Product Features:**
 - General purpose LED bulb for every space in your home.
 - 100W equivalent uses only 18 Watts (82% less energy than a traditional incandescent bulb).
 - 25,000 hours of beautiful, warm, energy-efficient light.
 - Dimmable with most standard dimmers.
 - Light instantly and provides an all-around, omnidirectional light distribution.

www.amazon.com/Cree-100W-Equivalent-White-Light/dp/B001ZKSL6/ref=pd_rm_gw_p_img_10?ie=UTF8&refRID=1NE31V97GNZYKRA4E3

Frequently Bought Together

Total price: \$60.83

Add All Items to Cart

Add All Items to List

✓ This item: Cree 100W Equivalent Soft White A21 LED Light Bulb \$19.97 (\$3.99 / Bulb)

✓ Cree 75W Equivalent Soft White (2700K) A19 LED Light Bulb \$15.97 (\$15.97 / Bulb)

✓ Cree 30/60/100W Equivalent Soft White (2700K) A21 3-Way LED Light Bulb \$24.89

Customers Who Bought This Item Also Bought

Page 1 of 11

Cree 75W Equivalent Soft White (2700K) A19 LED Light Bulb
★★★★★ (195)
\$15.97 *Prime*

Cree 30/60/100W Equivalent Soft White (2700K) A21 3-Way LED Light Bulb
★★★★★ (223)
\$24.89 *Prime*

Cree BA19-080270MB-12DE26-3, 120 60W Equivalent 2700K A19 LED Light Bulb with 4Pac...
★★★★★ (100)
\$5.99 *Prime*

Cree BA19-080270MB-12DE26-2U100 60W Equivalent 2700K A19 LED Light Bulb with 4Pac...
★★★★★ (398)
\$5.99 *Prime*

Cree BA19-080270MB-12DE26-3, 1 60W Equivalent 2700K A19 LED Light Bulb with 4Pac...
★★★★★ (29)
\$7.65 *Prime*

Cree BA19-080270MB-12DE26-2U120 60W Equivalent 2700K A19 LED Light Bulb (4-Pack) Set...
★★★★★ (781)
\$37.22

Cree 60W Equivalent Soft White (2700K) A19 LED Light Bulb (4-Pack)
★★★★★ (781)
\$19.35 *Prime*

Cree 75W Equivalent Soft White (2700K) A19 LED Light Bulb (5-pack)
★★★★★ (195)
\$34.99 *Prime*

Sponsored Products Related To This Item (What's this?)

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2-1 OLD Intro to N...
IRL Leadership...
Comprehensive Stat...
YanLuph...
Telep...
Signature 3 (1).PG

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www.amazon.com/Cree-100W-Equivalent-White-Light/dp/B001ZKSL6/ref=pd_rm_gw_p_img_10?ie=UTF8&refRID=1NE31V97GNZYKRA4E3

Cree 100W Equivalent Soft White A21 LED Light Bulb
\$19.97 (\$3.99 / Bulb) *Prime* In Stock. Ships from and sold by Amazon.com. Gift-wrap available.

Compare to Similar Items

	This item: Cree 100W Equivalent Soft White A21 LED Light Bulb	Philips 455709 100W Equivalent A19 LED Soft White Light Bulb, 3-Pack - Frustration Free Pack	Philips 455717 100W Equivalent A19 LED Daylight Light Bulb, 4-Pack	Philips 451905 100 Watt Equivalent A21 LED Light Bulb Soft White, Dimmable
Customer Rating	★★★★★ (433)	★★★★★ (185)	★★★★★ (587)	★★★★★ (168)
Price	\$19.97	\$26.99	\$35.00	\$11.38
Shipping	<i>Prime</i>	<i>Prime</i>	<i>Prime</i>	<i>Prime</i>
Sold By	Amazon.com	Amazon.com	Amazon.com	Z-Financial LLC
Item Package Weight	0.55 pounds	0.75 pounds	0.8 pounds	0.75 pounds
Item Shape	A21	A19	A19	A19
Special Features	A21 bulb shape with medium base	Information not provided	4 pack	Energy Savings
Wattage	10	14.5 Watts	14 Watts	19
	Add to Cart	Add to Cart	Add to Cart	Add to Cart

Please help us improve this feature. Tell us what you think of this feature.

Product Description

Item: 3-pack | Style: 100W Equivalent Soft White (2700K)

The Cree 100W equivalent LED bulb looks and lights like just like a light bulb. It works just like you would expect too - it lights instantly, is dimmable and emits a warm, omnidirectional light - using just a fraction of the energy of a traditional incandescent while lasting about 25 times longer. The perfect replacement for incandescent at a price you can afford, Cree LED bulbs pay for themselves quickly and continue to pay for you years.

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Ephemeral, Contextual Personalization

- Personalized to “what you are doing”
 - Your current navigation is a reflection of your current interest
 - Does not reflect any long-term knowledge of your preferences



How to Compute?

- Version I: Manual Cross-Sell Tables
 - Generated by marketers to reflect perceived cross-sales or up-sales
- Version II: Data Mining Associations
 - What are we looking for?
 - Mostly likely to be bought in this context?
 - Most “extra-likely” to be bought in this context?



Start Simple

- Start simple: percentage of X-buyers who also bought Y; divide the counts ...

$$\frac{X \wedge Y}{X}$$

- Intuitively right, but is it useful? What if X is anchovy paste and Y is bananas??
- Challenge – doesn't compensate for overall popularity of Y

Introduction to Recommender Systems



Bayes' Law

$$P(A|B) = \frac{P(B|A)P(A)}{P(B)}$$

Now, we look at how much more likely Y is than it was before:

$$\frac{P(Y|X)}{P(Y)}$$



Other solutions ...

- Association rule mining brings us the lift metric:

$$\frac{P(X \text{ AND } Y)}{P(X) * P(Y)}$$

- This looks at non-directional association
- More generally association rules look at baskets of products, not just individuals

Introduction to Recommender Systems



Association Rules in Practice

- The Beer and Diapers Story
- Not Just Products ... Link Associations
- Sports Cars and Leather Driving Gloves
- Are All Recommendations Worth Making
 - Business Rules



Some take-away lessons

- Product association recommenders use present context to provide more relevant recommendations
 - Current products; path; links
- Can compute product associations from prior transaction history
 - Balance between high-probability and increased probability
- Such recommendations can be targeted for additional or replacement purchases



Product Association Recommenders



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