Transaction ID Items Bought

0 1 Bread, Butter

1 2 Bread, Butter, Milk

2 3 Bread, Milk

3 4 Butter, Milk

4 5 Bread, Butter

5 6 Bread, Butter, Milk

6 7 Milk

7 8 Bread, Butter, Milk

8 9 Bread, Butter

9 10 Bread, Milk

### Combination 1: Bread → Butter

A = Antecedent = Bread

B = Consequent = Butter

Support(A) = 0.8 = X

Support(B) = 0.7 = Y

Support(A ∩ B) = 0.6 = Z

Confidence = Z/X = 0.75 = G

Lift = G/Y = 0.75/0.7 = 1.07

Conviction = (1 - Y) / (1 - G) = 0.3 / 0.25 = 1.2

% Bread Occurs in Transaction = 0.8

% Butter Occurs in Transaction = 0.7

% Both occur = 0.6

### Combination 2: Bread → Milk

A = Antecedent = Bread

B = Consequent = Milk

Support(A) = 0.8 = X

Support(B) = 0.6 = Y

Support(A ∩ B) = 0.5 = Z

Confidence = Z/X = 0.625 = G

Lift = G/Y = 0.625/0.6 = 1.04

Conviction = (1 - Y) / (1 - G) = 0.4 / 0.375 = 1.07

% Bread Occurs in Transaction = 0.8

% Milk Occurs in Transaction = 0.6

% Both occur = 0.5

### Combination 3: Butter → Bread

A = Antecedent = Butter

B = Consequent = Bread

Support(A) = 0.7 = X

Support(B) = 0.8 = Y

Support(A ∩ B) = 0.6 = Z

Confidence = Z/X = 0.857 = G

Lift = G/Y = 0.857/0.8 = 1.07

Conviction = (1 - Y) / (1 - G) = 0.2 / 0.143 = 1.40

% Butter Occurs in Transaction = 0.7

% Bread Occurs in Transaction = 0.8

% Both occur = 0.6

### Combination 4: Butter → Milk

A = Antecedent = Butter

B = Consequent = Milk

Support(A) = 0.7 = X

Support(B) = 0.6 = Y

Support(A ∩ B) = 0.4 = Z

Confidence = Z/X = 0.57 = G

Lift = G/Y = 0.57/0.6 = 0.95

Conviction = (1 - Y) / (1 - G) = 0.4 / 0.43 = 0.93

% Butter Occurs in Transaction = 0.7

% Milk Occurs in Transaction = 0.6

% Both occur = 0.4

### Combination 5: Milk → Bread

A = Antecedent = Milk

B = Consequent = Bread

Support(A) = 0.6 = X

Support(B) = 0.8 = Y

Support(A ∩ B) = 0.5 = Z

Confidence = Z/X = 0.833 = G

Lift = G/Y = 0.833/0.8 = 1.04

Conviction = (1 - Y) / (1 - G) = 0.2 / 0.167 = 1.20

% Milk Occurs in Transaction = 0.6

% Bread Occurs in Transaction = 0.8

% Both occur = 0.5

### Combination 6: Milk → Butter

A = Antecedent = Milk

B = Consequent = Butter

Support(A) = 0.6 = X

Support(B) = 0.7 = Y

Support(A ∩ B) = 0.4 = Z

Confidence = Z/X = 0.667 = G

Lift = G/Y = 0.667/0.7 = 0.95

Conviction = (1 - Y) / (1 - G) = 0.3 / 0.333 = 0.90

% Milk Occurs in Transaction = 0.6

% Butter Occurs in Transaction = 0.7

% Both occur = 0.4

Sure, here's the analysis in a copyable format:

### Bread → [Item] Combinations

#### 1. \*\*Sorted by Lift\*\*

Lift measures how much more likely the consequent is to occur given the antecedent compared to if the two were independent.

1. \*\*Bread → Butter\*\*

- Lift: 1.07

- Confidence: 0.75

- Conviction: 1.2

- Support(A ∩ B): 0.6

2. \*\*Bread → Milk\*\*

- Lift: 1.04

- Confidence: 0.625

- Conviction: 1.07

- Support(A ∩ B): 0.5

#### 2. \*\*Sorted by Confidence\*\*

Confidence measures how often the consequent is true when the antecedent is true.

1. \*\*Bread → Butter\*\*

- Confidence: 0.75

- Lift: 1.07

- Conviction: 1.2

- Support(A ∩ B): 0.6

2. \*\*Bread → Milk\*\*

- Confidence: 0.625

- Lift: 1.04

- Conviction: 1.07

- Support(A ∩ B): 0.5

#### 3. \*\*Sorted by Conviction\*\*

Conviction measures the strength of the implication.

1. \*\*Bread → Butter\*\*

- Conviction: 1.2

- Lift: 1.07

- Confidence: 0.75

- Support(A ∩ B): 0.6

2. \*\*Bread → Milk\*\*

- Conviction: 1.07

- Lift: 1.04

- Confidence: 0.625

- Support(A ∩ B): 0.5

#### 4. \*\*Sorted by Support(A ∩ B)\*\*

Support(A ∩ B) measures how frequently both items appear together.

1. \*\*Bread → Butter\*\*

- Support(A ∩ B): 0.6

- Lift: 1.07

- Confidence: 0.75

- Conviction: 1.2

2. \*\*Bread → Milk\*\*

- Support(A ∩ B): 0.5

- Lift: 1.04

- Confidence: 0.625

- Conviction: 1.07