

Joint Discrete Distributions

Use the complete labeled joint PMF table. Show normalization, requested sums, and marginal products before deciding independence.

1.

3x3 table. Rows $X=68,69,70$; columns $Y=166,167,168$; weights / 36: 1,2,3 / 2,4,6 / 3,6,9. Find the full conditional PMF of Y given $X=70$.

Assumptions: The displayed support is complete; omitted pairs have probability 0.
Independence requires equality in every cell.

2.

2x3 table. Rows $X=82,83$; columns $Y=194,195,196$; weights / 18: 1,2,3 / 2,4,6. Find $F(82,195)$.

Assumptions: The displayed support is complete; omitted pairs have probability 0.
Independence requires equality in every cell.

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3.

2x3 table. Rows $X=7,8$; columns $Y=44,45,46$; weights / 45: 6,11,5 / 10,4,9. Find $E(X)$, $E(Y)$, $E(XY)$.

Assumptions: The displayed support is complete; omitted pairs have probability 0.
Independence requires equality in every cell.

4.

2x2 table. Rows $X=12,13$; columns $Y=54,55$; weights / 9: 1,2 / 2,4. Find $P(X=13 \text{ or } Y=54)$.

Assumptions: The displayed support is complete; omitted pairs have probability 0.
Independence requires equality in every cell.

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5.

2x3 table. Rows $X=4,5$; columns $Y=38,39,40$; weights / 18: 1,2,3 / 2,4,6. Are X and Y independent? Check every cell.

Assumptions: The displayed support is complete; omitted pairs have probability 0.
Independence requires equality in every cell.

6.

2x3 table. Rows $X=-65,-64$; columns $Y=-100,-99,-98$; weights / 26: 0,4,9 / 3,8,2. Find both full marginal PMFs.

Assumptions: The displayed support is complete; omitted pairs have probability 0.
Independence requires equality in every cell.

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7. 3x3 table. Rows $X=-52,-51,-50$; columns $Y=-74,-73,-72$; weights / 36: 1,2,3 / 2,4,6 / 3,6,9. Find c and identify zero-probability cells.

Assumptions: The displayed support is complete; omitted pairs have probability 0.
Independence requires equality in every cell.

8. 2x3 table. Rows $X=43,44$; columns $Y=116,117,118$; weights / 33: 4,9,3 / 8,2,7. Find both full marginal PMFs.

Assumptions: The displayed support is complete; omitted pairs have probability 0.
Independence requires equality in every cell.