F14076083 魏湧致

4.24

f(x,y) = , x=0,1,2,3 y=0,1,2 1≤x+y≤4

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| x | 0 | 1 | 2 | 3 |  | y | 0 | 1 | 2 |
| g(x) | 5/70 | 30/70 | 30/70 | 5/70 |  | h(y) | 15/70 | 40/70 | 15/70 |

1. E() = =
2. μx – μy = E(X) – E(Y) = 0\*5/70 + 1\*30/70 + 2\*30/70 + 3\*5/70 –

(0\*15/70 + 1\*40/70 + 2\*15/70) = 1/2

4.44

= E(XY) − μxμy = − 105/70

= 1\*1\*18/70 + 2\*1\*18/70 + 3\*1\*2/70 + 1\*2\*9/70 + 2\*2\*3/70 − 3/2 = 9/7 – 3/2 = −3/14

4.60

E(X) = 2(0.15+0.25+0.15) + 4(0.1+0.25+0.1) = 1.1 + 1.8 = 2.9

E(Y) = 1(0.15+0.1) + 3(0.25+0.25) + 5(0.15+0.1) = 0.25 + 1.5 + 1.25 = 3

1. E(2X-3Y) = 2E(X) – 3E(Y) = 2\*2.9 – 3\*3 = −3.2
2. E(XY) = E(X)E(Y) = 2.9\*3 = 8.7 (independent)

4.78

μ = E(X) = = 30( − + ) = 0.5

E() = = 30( − + ) =

= E() − = 2/7 – 1/4 = 1/28 , σ ≈ 0.19

用Chebyshev’s theorem P(μ−2σ < X < μ+2σ) ≥ 1 – 1/4 = 0.75

P(μ−2σ < X < μ+2σ) = P(0.12 < X < 0.88) =

=30( − + ) ≈ 30(0.227 – 0.3 + 0.1055) – 30(0.000576 – 0.0001 + 0)

=0.96072 ≥ 0.75

4.98

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| x | 0 | 1 | 2 |  | y | 0 | 1 | 2 |
| g(x) | 0.2 | 0.32 | 0.48 |  | h(y) | 0.26 | 0.35 | 0.39 |

|  |  |  |  |
| --- | --- | --- | --- |
| x | 0 | 1 | 2 |
| f(x|2) = |  |  |  |

1. E(X) = 0\*0.2 + 1\*0.32 + 2\*0.48 = 1.28

Var(x) = E() - = 0\*0.2 + 1\*0.32 + 4\*0.48 – 1.28\*1.28 = 0.6016

1. E(X|Y=2) = 0\* + 1\* + 2\* =

Var(X|Y=2) = E(|Y=2) - = 0\* + 1\* + 4\* −

= - = =