

AEB 6571 - Econometric Methods I

Assignment 4

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1. Using the function

$$f(x, y) = -\frac{6}{5}x^2 + \frac{12}{5}xy - \frac{6}{5}y^2 + \frac{6}{5} \quad (1)$$

where $x, y \in [0, 1]$.

- a. Compute the variances of x and y and the covariance between x and y .
 - b. Are these variables independent?
2. Compute the sample variance matrix for the data in Table 1. Are these variables independent?
 3. Given the distribution function

$$f[x] = \frac{4}{5} + \frac{6}{5}x - \frac{6}{5}x^2 \quad (2)$$

derive the moment generating function. Compute the first moment using the moment generating function.

Table 1: Sample Data

Observation	x_1	x_2
1	3.8308889	-2.6935560
2	1.5360406	-0.9453901
3	2.0720865	-4.1728102
4	-1.6876972	1.1404326
5	4.4572551	5.1307901
6	3.7500745	-8.5985386
7	-2.6197932	1.6261850
8	0.8570946	7.6128011
9	1.3943251	-4.2215630
10	1.8269648	-14.4343855