Problems

Digital Assignment 1

1. The birth rate and death rate per thousand persons in Switzerland from 1968 to 1980 were as follows:

Birth rate (X)	17.1	16.5	15.8	15.2	14.3	13.6	12.9	12.3	11.7	11.5
Death rate (Y)	9.3	9.3	9.1	8.2	8.9	8.9	8.5	9.7	9.0	8.7

11.3	11.3	11.6
9.1	9.0	9.2

Find the correlation between the birth rate (X) and the death rate(Y).

2. The joint probability mass function of (X, Y) is given by $p(x, y) = k(2x + 3y), x = 0,1,2; y = 1,2,3$. Find all the marginal distributions. Also find the probability distribution of $(X + Y)$.

3. The joint pdf of a two-dimensional random variable (X, Y) is given by $f(x, y) = xy^2 + \frac{x^2}{8}, 0 \le x \le 2, 0 \le y \le 1$.
Compute $P(X > 1), P\left(Y < \frac{1}{2}\right), P(X > 1/\, Y < \frac{1}{2})$.

4. In a university, 30 per cent of the students doing a course in statistics use the book authored by A1, 45 per cent use the one authored by A2, and 25 percent use the one authored by A3. The proportion of students who learnt about each of these books through their teachers are: A1=0.50, A2=0.30, and A3=0.20. One of the students selected at random revealed that he learnt about the book he is using through his teachers. Find the probabilities that the book used is authored A1, A2, A3 respectively.

5. A fair die is thrown twice.
(i) Determine the probabilities of getting the face-point sums (a). atmost 8 (b) at least 10 and (c) exactly 8 or 10.
(ii) Determine the probability of getting 2, 4, 5 or 6 on the first throw and 1, 4 or 6 on the second throw.