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Homework -3

Sub: Probability and Statistic

1.1 Here

Find the value of A: continuous joint PDF to find the value of A consider:-

………………………………1

dx and dy separately

…………………………………………………….........2

Let u = -3x

* du = - 3dx
* dx = -

Here x = 0 x =

Therefor u = 0 u =

Substituting dx. - 3x

=

=

=

=

=

Therefore

The same way to get …………………….3

Substituting 3 2 to 1

* A.

A = 12

1.2 compute the probability p(0x< 1, 0y< 2)

Here x = 0 to 0.9

y = 0 to 1.9

And A = 12

= ……………………………….2(i)

Compute separately

Let u = - 3x

Here x = 0 to x = 0.9

u = 0 to u = -2.7  
So

=

=

=

= 0.3109

= ………………………………………..2(ii)

And = ………………………………….......2(iii)

Substitute the value from 2(ii) and 2(iii) in 2(i)

Then p(0x< 1, 0y< 2) = .

= 0.932328 ans

1.3 Marginal PDF

=

=

=

=

And

=

=

= ans

1.4 find E(x), E(y) E(xy)

Here E(x) =

=

=

=

= 2.9985 \* ……………………3(i)

= 2.9985\*0.08348

Where = x, dg =

dy = dx , g =

so

= 0.2503

E(y) =

=

=

=

= 3.7312 \* ……………………………3(ii)

= 3.7312\*0.062331

= 0.2322

E(xy) = – E(x)E(y)

= – E(x)E(y)

= 12 – E(x)E(y)

= [12\*(0.08348)\*(0.062231)] – (0.2503)(0.2322) [from 3(ii) and 3(i) ]

= 0.0042

**1.5 x and y independent or not ?**

i.e correction

|  |  |  |
| --- | --- | --- |
|  | Value | comment |
|  | Close to 1 | Somehow related |
|  | Close to -1 | Strongly related |
|  | Close to 0 | indepandent |

=

=

= 2.9985 \* 0.0375

= 0.1124

Var (x) = 0.1124 -

= 0.0498

6x =

=

=

= 3.3712

= 3.3712 \* 0.03066

= 0.114398592 – 0.05391684

= 0.0605

Var (y) = 0.0605

6y =

Now

= 0.0765

is close to zero so x and y are independent.