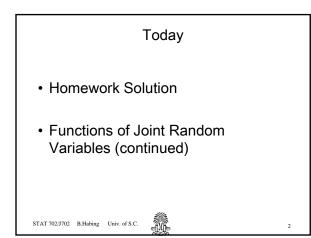
STAT 702/J702 October 19th, 2004 *-Lecture 17-*

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Homework 11) Consider the joint pdf f(x,y)=1+a(1-2x)(1-2y) defined for 0 < x,y < 1, -1 < a < 1.
Find what conditions must be met for X and Y to be independent.

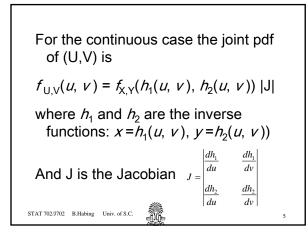
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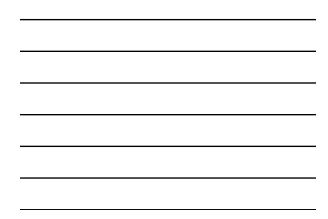
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3.6.2 - Functions of Joint Random
Variables(X, Y) have joint pdf
$$f_{XY}(x, y)$$
.We want the distribution of
 $U=g_1(X, Y), V=g_2(X, Y)$.E.g. : $U=X+Y, V=Y^2$ or $U=X+Y, V=X-2Y$, etc.STAT 702/702 BHabing Univ. of S.C.







Example 1) X and Y have joint p.d.f. $f_{XY}(x,y) = 2$ $0 \le x \le y \le 1$ U=X/Y and V=Y

Find the joint and marginal p.d.f's of X and Y.

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Example 2) X and Y are bivariate normal with means 0, variances 1, and correlation = 0.

Let
$$r = \sqrt{x^2 + y^2}$$
 and $\theta = \tan^{-1}\left(\frac{y}{x}\right)$

Find the joint and marginal distributions.

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3.6.1 - Special Case 1 – Convolution

In general say Z=X+Y

We can find a general formula for $F_Z(z)=P(Z < z)$ simply by finding the appropriate area under f(x,y).

Taking the derivative then gives us the pdf.

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Example) X and Y are exponential RVs with parameter λ .

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