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## EECS 461 Probability and Statistics

Fall Semester 2022

Quiz #1 26 August 2022

Monitor three consecutive packets going through an Internet router. Based on the packet header, each packet can be classified as either video ( $v$ ) if it was sent from a Youtube server or as ordinary data ( $d$ ). Your observation is a sequence of three letters (each letter is either  $v$  or  $d$ ). For example, two video packets followed by one data packet corresponds to  $vvd$ .

1. Write the elements of the following sets:

$A_1 = \{\text{second packet is video}\}$

$B_1 = \{\text{second packet is data}\}$

$A_1 = \{vvv, \checkmark dvv, \checkmark vvd, \checkmark dvd\}$

$B_1 = \{\checkmark vdv, \checkmark ddd, \checkmark vdd, \checkmark ddv\}$

vvv  
dvv  
vdy  
vvd  
ddd  
vdd  
dvd  
ddv

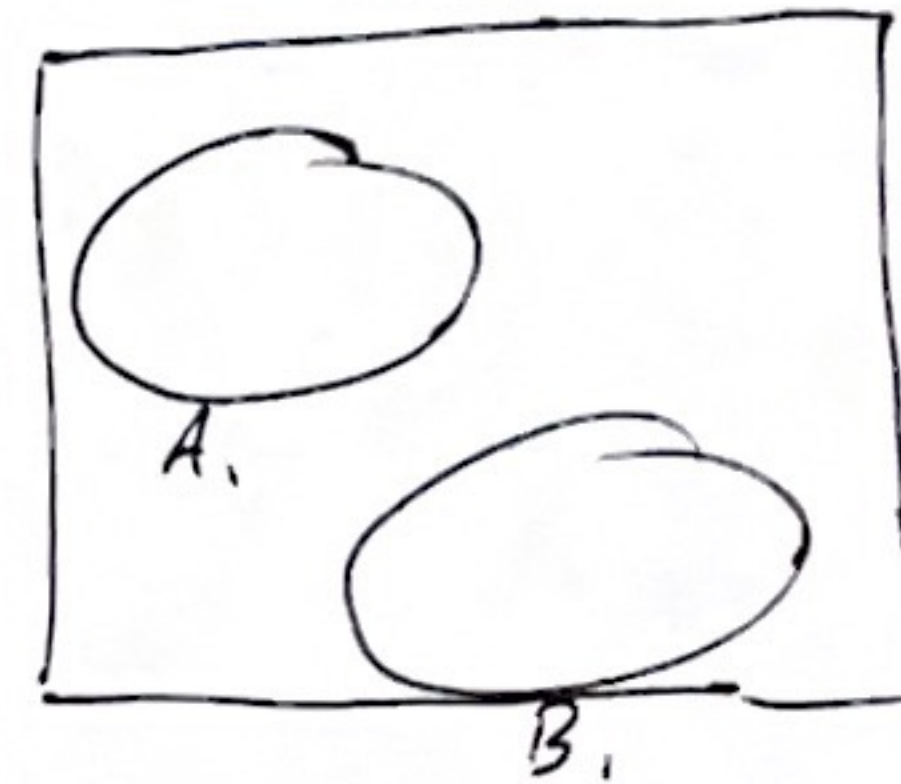


FIG 1.

2. Are  $A_1$  and  $B_1$  mutually exclusive? Give a short explanation for your answer.

/DISJOINTED

YES, BY DEFINITION THERE ARE NO ELEMENTS OF  $A_1$  THAT ARE ALSO CONTAINED IN  $B_1$ . ~~and vice versa~~

~~LESS~~

$x \in A$  BUT NOT  $x \in B$

3. Are  $A_1$  and  $B_1$  collectively exhaustive? Give a short explanation for your answer.

NO, EACH ELEMENT OF  $A$  DOES NOT CORRESPOND TO EACH ELEMENT OF  $B$ .