

1. For this problem you will be using the Vernam crypto system.

A	-	00000	H	-	00111	O	-	01110	V	-	10101
B	-	00001	I	-	01000	P	-	01111	W	-	10110
C	-	00010	J	-	01001	Q	-	10000	X	-	10111
D	-	00011	K	-	01010	R	-	10001	Y	-	11000
E	-	00100	L	-	01011	S	-	10010	Z	-	11001
F	-	00101	M	-	01100	T	-	10011			
G	-	00110	N	-	01101	U	-	10100			

Using the above code turn the message “hair” into a binary message. Next make a Vernam key by flipping a coin (enough times to make a big enough key). Then encipher the message using the key.

2. Suppose two dice are rolled successively. Let  $X$  be the sum of the two dice,  $Y$  be the difference (first roll minus the second),  $Z$  the number of odd rolls and  $W$  the number of prime rolls. Find:
- the ranges of four random variables
  - $P(X \geq 5)$
  - $P(X \geq Z)$
  - $P(X = 2|Z = 0)$
  - $P(X = 12|W = 1)$
  - $E(Z)$
  - $E(Z + W)$
  - Are  $Z$  and  $W$  independent? Prove or disprove.
3. Find the schedule of classes for the spring semester on your [my.sandiego.edu](http://my.sandiego.edu) site. Find three classes that you are thinking about and write down the classes and the times.