

## Karnaugh Map

*All lab work must be initiated during the lab hour and be completed during the lab hour. Only when additional time is required, the student may turn the lab in the following day for 2 points off.*

2. A majority circuit is a combinational circuit whose output is equal to 1 if the input variables have more 1's than 0's. The output is 0 otherwise. Design a 3-input majority circuit.

X	Y	Z	output
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	1

$x'yz$

$xy'z$

$xyz'$

$xyz$

$$\text{output} = x'yz + xy'z + xyz' + xyz$$

$xy/z$	00	01	11	10
0	$x'y'z'$	$x'y'z$	$x'y'z$	$x'y'z'$
1	$xy'z'$	$xy'z$	$xyz$	$xyz'$

$$\text{out} = xz + xy + yz$$