

MATH 120: Quantitative Reasoning

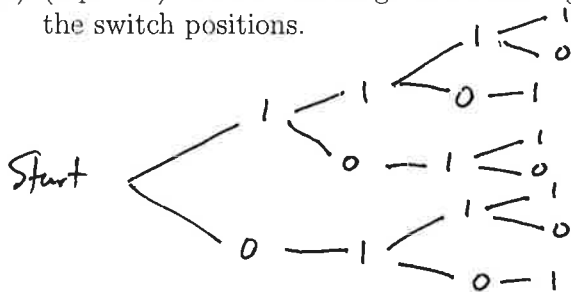
Quiz 1
Fall 2011

Name: KEY

Clearly indicate your final answer(s) and follow all instructions. Explain your reasoning where appropriate. Partial credit may be awarded for answers containing only minor mistakes.

1. A certain type of computer has a series of on-off switches built into its video card. For different orientations of these switches optional settings are made available to the user. **How many different settings are possible if no two adjacent switches can be in the off position?** *four switches*

(a) (3 points) Draw a tree diagram describing the video card's settings. Let 1 = on, 0 = off, denote the switch positions.



you cannot have two 0's in a row

(b) (3 points) How many settings are there? List them all.

1111	1011	0110
1110	1010	0101
1101	0111	

} 8 total

2. (2 points) In a race with 8 runners, in how many ways could the runners finish first, second, and third?

$$P(8,3) = 336 \quad \underline{8} \cdot \underline{7} \cdot \underline{6} = 336$$

order matters, no repeats

3. (2 points) Your ACU user name consists of three lower case letters, followed by two numbers 0-9, followed by another lower case letter. For example, abc99a, is possible. If numbers and letters are allowed to repeat, how many different user names are possible?

$$\underbrace{26 \ 26 \ 26}_{\text{letters (26)}} \quad \underbrace{10 \ 10}_{\text{numbers (0-9)}} \quad \underbrace{26}_{\text{letter}} = 26^4 \cdot 10^2 = 45,697,600$$