MA162: Finite mathematics

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April 20, 2010

Schedule:

- HW D2 is due Monday, Apr 26th, 2010.
- HW D3 is due Friday, Apr 30th, 2010.
- Final Exam is Thursday, May 6th, 6:00pm-8:00pm
- There is an alternate signup sheet due Thursday, April 22nd

Today we will cover 7.3: Rules of probability

7.2 Quiz Review

- Prob of rolling less than 5 and more than or equal to 2?
  Sample space $= \{1, 2, 3, 4, 5, 6\}$ all samples equally likely

  Event $= \{2, 3, 4\}$
  Probability $= \frac{3}{6} = 50\%$

- Probability of more heads than tails on three flips?
  Sample space $=\{$ HHH, HHT, HTH, HTT, THH, THT, TTH, TTT $\}$
  all equally likely

  Event $= \{$ HHH, HHT, HTH, THH $\}$
  Probability $= \frac{4}{8} = 50\%$

7.2 Quiz Review

- All or no heads, versus 1 or 2 heads.
  Sample space = { 0 heads, 1 heads, 2 heads, 3 heads }
  with probabilities $\frac{1}{8}$, $\frac{3}{8}$, $\frac{3}{8}$, and $\frac{1}{8}$.

  Event = { 0 heads, 3 heads }
  Probability $= \frac{1}{8} + \frac{1}{8} = 25\%$

  Event = { 1 heads, 2 heads }
  Probability $= \frac{3}{8} + \frac{3}{8} = 75\%$

7.3: Uniform versus non-uniform

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- In uniform spaces, all we need to do is count, so we can use chapter 6.
- In non-uniform spaces, we need to be certain of the rules.

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- With these three rules, you can now calculate all probabilities.
- Basically you are just counting except each outcome has a **weight**

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- You could count the number of ways, I get 91 out of 216 ways.
- You can use the first shortcut: probability of it NOT happening is $(\frac{5}{6})^3$, so probability that it happens is $1 - (1 - \frac{1}{6})^3 = \frac{91}{216}$.

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$0 \leq t < 1$	$1 \leq t < 3$	$3 \leq t < 5$	$5 \leq t < 7$	$7 \leq t < 10$	$10 \leq t$
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  What percentage of people plan to keep their car less than five years?

- Three or more years?

- An odd number of years?