Week 6 Recitation

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- (1 min max) Go over quiz from last week
- (2 min max) Go over homework from last week.
- Questions about lecture / homework so far?
- Questions from refresher sheet...
  1. Number 7: "Prove that $n(2n+1)(2n-1)$ is always divisible by 3."
- Find the power Set of $\{1, 2, \{3, 4, 5\}\}$:

  First, consider how many elements the power set has. If the set has n elements, there will be 2^n elements. Because we have 3 elements, there will be $2^3 = 8$ elements.

  Now, we can list all 8 elements:

  $$\{\emptyset, \{1\}, \{2\}, \{\{3, 4, 5\}\},$$
  $$\{1, 2\}, \{1, \{3, 4, 5\}\}, \{2, \{3, 4, 5\}\},$$
  $$\{1, 2, \{3, 4, 5\}\}\}$$

  Note: We use {} and not ().
- Find the Cartesian Product for $A \times B \times C$ for $A = \{1, 2, 3\}$, $B = \{c\}$, $C = \{\{1, 2, 3\}, \{a, b, c\}\}$:

  {(1,c,{1,2,3}), (1,c,{a,b,c}),(2,c,{1,2,3}), (2,c,{a,b,c}),(3,c,{1,2,3}), (3,c,{a,b,c})}
- (Rosen 2.2:17b) Show that if A, B, and C are sets, then $\overline{A \cap B \cap C} = \bar{A} \cup \bar{B} \cup \bar{C}$

  Because the problem does not say what method we must use to prove this, we can take advantage of membership tables:

A	B	C	$A \cap B \cap C$	$\overline{A \cap B \cap C}$	$\bar{A}$	$\bar{B}$	$\bar{C}$	$(\bar{A} \cup \bar{B} \cup \bar{C})$
0	0	0	0	1	1	1	1	1
0	0	1	0	1	1	1	0	1
0	1	0	0	1	1	0	1	1
0	1	1	0	1	1	0	0	1
1	0	0	0	1	0	1	1	1
1	0	1	0	1	0	1	0	1
1	1	0	0	1	0	0	1	1
1	1	1	1	0	0	0	0	0

- (Last 10 minutes) Quiz