MATH 363 Discrete Mathematics
Assignment 6

Due by February 23rd **in class**

There are 5 topics we will examine in the Midterm:

1. Logic
2. Proofs
3. Sets and Functions
4. Algorithms and growth of functions
5. Number Theory

The exam will be comprised of three sets of questions which are *Hard, Meddium, Easy* respectively.

- **Easy questions:** (Are worth **1pt.**)
  Requires only to **verify/remember basic definitions** or concepts. Answers to easy questions requires no justification.
- **Meddium questions:** (Are worth **2pt.**)
  Ask to **use concepts** learned in class in a **simple, straightforward manner**. Some work and/or justification is required. (e.g. Perform operations, apply the pigeonhole principle to a problem, etc.)
- **Hard questions**: (Are worth **3pt.**)
  Ask for answer that requires a **longer justification and a bit of reflexion**. It can be a problem composed of several simple questions. (e.g. $\sum_{i\in I}(\sum_{j\in J} a_j)$) or a proof that requires a deep understanding of the concepts.

The exam will be designed so that students take, in average, **30 minutes** to solve **all easy and meddium questions** and thus, they have about **20 minutes** to **work on harder/longer problems**.

1 Instructions for this assignment

Extra +5pt to submissions typed in latex or similar.

1.1 By Tuesday February 23rd

1. Design an exam that satisfies the following requirements:
   i) (**5pt**) There are at between 20 and 35 questions in total.
   ii) (**5pt**) There are between 3 and 5 hard questions.
   iii) (**5pt**) Hard questions are worth between 20% and 30% of the exam.
   iv) (**5pt**) Easy questions are worth at most 40% of the exam.
   v) (**5pt**) The questions regarding any given topic are worth at least 15% of the exam.

Discuss in groups what are the questions/problems which are more important to examine.
But **each student must have their own set of questions**.

2. Bring two copies of the exam to class. Submit one of them including the following table:

Questions	# Questions	% of points
Hard Meddium Easy		
Total		
Logic Proofs Set/Functions Growth of Functions Number Theory		

1.2 On the class of February 23rd

3. (**15 pt.**) Make pairs of students. Apply the exam to your partner and take on his/her exam. (I will organize this.)

4. At the end of the class grade the exams and discuss with your partner which questions were more difficult, ambiguous, etc.

- I will stay until 4pm on Tuesday to answer questions. And there will be office hours on Wednesday from 2:30-4:00 pm.