Homework 1: Non-Coding

1) The first lecture noted how the game "Spot It!" relies on numerous symbols, shown on each card, which have to be rapidly and mutually distinguishable, and, ideally, equally distinguishable across all pairs of symbols. Name another physical or electronic game (and link to some graphical description of it), which also hinges on having a finite set (more than 2) of rapidly and mutually distinguishable symbols or visual properties. How would a failure of being able to rapidly discern all the symbols, or having large variation in the pair-wise distinguishability of all the symbols (i.e. two symbols look more similar than do two other symbols) affect the game play, such as the fairness for one player, or the consistency of the game over time? Be concise; 90 words or less. The "Set" card game is a great example, but we'll discuss it in class, so you have to pick something besides Set to describe.

   Uno is a game that hinges on the finite set of numerals (which can be thought of as “shapes”) and colors for mutual distinguishable symbols or visual properties. The two main components of the game play is either matching symbols (Reverse, +2, +4, Wild, and cards including numerals) or colors (typically yellow, red, blue, and green) when adding cards to the stack. The premise of the game is to decrease the number of cards held by any given player to one (where a player will have to yell “Uno”) and, subsequently, no cards. Without color and symbol matching abilities, the games is halted and the flow is disrupted. In worst cases, a player who is unable to see a color or symbol match between the top card on the stack and a card in their hand may result in missed opportunities to decrease the number of cards in their hand or (if there is a +2 or +4 on top) a player that has a +2 or +4 *could* stack these “take 2” or “take 4” cards but, if they miss their opportunity, the would have to add cards to their hand, causing them to stray further from the goal.

2) Concerning [Stevens-Scales-1946]: State how Stevens would identify the scale (nominal aka categorical, ordinal, interval, and ratio) for each of the following variables, or say "phase" if it is a phase variable. Some may have more than one correct answer. A terse justification (20 words or less) is allowed, but not needed.
   a. Degrees Kelvin
      i. Ratio
   b. Pokémon types
      i. Nominal
   c. Gregorian calendar dates
      i. Interval

d. Cryptographic (e.g. md5) hashes
    i. Nominal
e. Rankings of CS departments in various colleges
    i. Ordinal
f. A scale for which measurement 0 signifies the absence of some actual physical quantity or phenomenon
    i. Ratio
g. 1-to-5 star restaurant ratings
    i. Ordinal
h. Mohs' scale of mineral hardness
    i. Ordinal
i. A variable V>0 for which using log(V) instead of V makes no practical difference (but using –V would not work)
    i. Interval
j. Time of day, in the context of studying how the quantity of internet traffic changes over the course of an average day in a particular neighborhood
    i. Phase
k. A particular moment in time (i.e. which year, month, day, time-of-day), as measured by number of seconds since January 1 1970
    i. Ratio