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CS 160
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Assignment #2 Problem Solving

Due: Friday, 10/17/14, 11:59pm

1. (40 pts) Let's use a game to teach us the three steps. Go to <http://robozzle.com>. You have to play the tutorial to learn the game, i.e. understand the problem.

- After the tutorial, go to the EasytoHard tab to see a list of games to play.
- **Play 4 games of your choice:**

- Write down the puzzle you are solving.

1. Zipline
2. Two stripes
3. Mountains
4. Blue X

- Write down the steps needed to solve each of these puzzles.

1. up, turn right (on blue), turn right (on green), F1.
2. up, turn right (on green), turn left (on red), F1.
3. F1: up, turn right (on red), F2. F2: up, turn left (on red), F1.
4. up, turn left, turn right (on blue), F1.

- Run the games to make sure your solution works.

- Are there many solutions to any of the puzzles you chose?

1. No, I don't think so.
2. No, I can't think of any.
3. No, I don't think so.
4. Yes, I found many solutions.

(40 pts) Complete the 3 of the 4 problem-solving steps to solve the following problem. Find the largest number out of 5 random cards pulled from a deck of cards. You probably want to sit down with a few friends for this and have them talk their process out loud as they solve the problem.

2. Follow the form outlined as follows:

- **Step 1: Problem Analysis.**

- a. Comments about the problem to aid in understanding it.
 1. Choose 5 cards in a deck of cards.
 2. Compare the numbers and which one is bigger.
- b. Description of the knowledgebase (this list would include what you would be expected to know to follow the solution).
 1. Know which number is bigger.
 2. Ace is the highest card, which is bigger than "K", and "K" is bigger than "Q". "J" is smaller than "Q", but bigger than "10".
 3. If there are same number card, spade would be biggest, and then go by hearts, clubs and diamonds.

- **Step 2: Program Design.** List the specific steps that would enable another person to find the largest among the 5 numbers presented. Remember, you have to be very explicit here to make sure one can actually accomplish the task using your directions.

1. Find a deck of cards.
2. Walk to in front of the cards.
3. Put the cards on the table.
4. Pick a card with your right hand.
5. Pick the 2nd card with your left hand and compare to the card with your right hand.
 - a. If the card on your left hand is bigger than the card on your right hand.
 - i. Replace the card on your right hand with the card on your left hand.
 - b. If the card on your left hand is smaller than the card on your right hand.
 - i. Throw the card on your left hand away.
6. Keep picking cards with your left hand, and repeat step 5 (a and b). The biggest card is in your right hand in the end.

- **Step 4: Program Testing.**

Create a Test Plan with several test cases including the average and extreme cases.

1. Found 3 people and let them test the program

- a. If the outcome is correct, find another 3 people and test it again.
 - b. If the outcome is wrong, re-design the program.
3. (20pts) How does your solution change if the size of the list is *50, 500, or n* , instead of 5?

I think my solution won't change if the size of the list is 50, 500, or n , instead of 5.