Name(s)_____ Period _____ Date _____

Activity - Minimum Card Algorithm

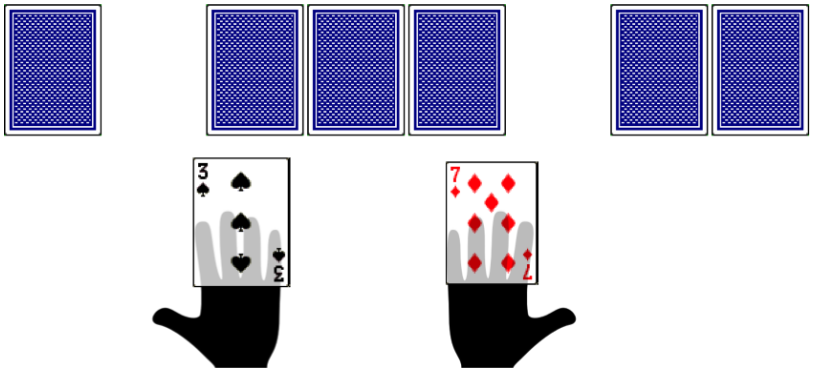
"Human Machine" Algorithms

We often get started thinking about algorithms by trying to rigorously act them out ourselves as a sort of "Human Machine". When acting as a machine, we can keep the limitations of a computer in mind.

In this activity, you'll design an algorithm to find the smallest item in a list. Obviously, if we were really writing instructions for a person, we could simply tell them: "find the smallest item in a list." But that won't work for a computer.

We need to describe the *process* that a person must go through when they are finding the smallest item. What are they *really* doing?

Setup and Rules:



- We'll use playing cards face down on the table to represent a list of items. Start with 8 random cards face down in a row.
- Any card on the table ***must*** be face down.
- When acting as the machine, you can pick up a card with either hand, but *each hand can only hold one card at a time.*
- You can look at and compare the values of any cards you are holding to determine which one is greater than the other.
- You can put a card back down on the table (face down), but once a card is face down on the table, you cannot remember (or memorize) its value or position in the list.

Task:

Write an algorithm to find the card with the lowest value in the row of cards.

- Goal: The algorithm must have a clear end to it. The last instruction should be to say: "I found it!" and hold up the card with the lowest value.
- The algorithm should be written so that it would theoretically work for any number of cards (1 or 1 million).
- Write your algorithm out on paper as a clear list of instructions in "pseudocode." Your instructions can refer to the values on cards, and a person's hands, etc., but you must invent a systematic way for finding the smallest card.

My Algorithm To Find Minimum Card

Write your algorithm below. We suggest writing it out as a numbered list of instructions to make the sequence clear.

1.