Software Engineering Technical Challenge

Phase 10

Instructions

Please complete the challenge described below. In creating your solution, you may use the programming language and framework of your choice. Upload your working solution to a public repository, such as GitHub, and send me a link to it. You will later be asked to demo your solution to us via Zoom.

Challenge

Phase 10 is a card game where players try to create particular sets or runs of numbers with their hand of 10 cards. Cards are numbered 1-12 (ignore card colors, skips and wilds). There are eight of every card for a total of 96 cards.

Create a program that, when given a hand of 10 numbers representing cards from the deck, prints all phases the hand meets. A phase is met if the hand contains at least the phase requirements. The phases are:

- Phase 1: 2 sets of 3
- Phase 2: 1 set of 3 + 1 run of 4
- Phase 3: 1 set of 4 + 1 run of 4
- Phase 4: 1 run of 7
- Phase 5: 1 run of 8
- Phase 6: 1 run of 9
- Phase 7: 2 sets of 4
- ~~Phase 8: 7 cards of one color~~ (Ignore this phase)
- Phase 9: 1 set of 5 + 1 set of 2
- Phase 10: 1 set of 5 + 1 set of 3

Definitions:

- **Set**: multiple cards of the same value
- **Run**: multiple cards in consecutive ascending order

For example, if the hand contains the cards 1, 2, 3, 4, 5, 6, 7, 8, 8, and 8, the program should indicate that phases 2, 4, and 5 are met.

- Phase 2 is met because there is a set of three 8's and there is at least one run of four in the remaining cards: 1-4, 2-5, 3-6, or 4-7.
- Phase 4 is met because there is at least one run of seven: 1-7, or 2-8.
- Phase 5 is met because there is a run of 8: 1-8.

Note that the same card cannot be reused within different sets or runs in the same phase. For example, in phase 2, the same "8" card cannot be used for the set of 3 and again for the run of 4.