SWE 3313 TERM PROJECT DESCRIPTION
Spring 2020

You are to design a desktop application of the **Baker's Dozen Solitaire card game**. To become familiar with this game, go to http://WorldofSolitaire.com .

Project Description

This game uses a standard deck of 52 playing cards, with jokers removed, comprised of: two colors – Red and Black; 4 suits- Clubs, Spades, Hearts, and Diamonds; Clubs and Spades are Black and Hearts and Diamonds are Red; and each suit has 13 cards in it – Ace (for One), 2 – 10, Jack (eleven), Queen (twelve) and King (thirteen).

The game has a game board that contains *Tableau* and *Foundations* areas. The entire deck of 52 cards must be created (hopefully by reusing it from an existing library), shuffled (randomized), and dealt into the *Tableau.* The *Tableau* contains thirteen table piles, organized into two horizontal rows, with 7 piles in the first row and 6 piles in the second row. Each of the 13 piles contains 4 face-up cards. Four of the piles each have a King as the bottom card. Other than these 4 cards, the rest of the deck is in random order. The board also has a vertical column for the *Foundations*, which initially has 4 empty slots, which will each contain one of the 4 suits.

To set up the game, you must create the deck, shuffle it, and deal it into the *Tableau*. You will need to locate the 4 Kings and place them in the bottom of any 4 of the 13 empty piles. Then you deal one card into the remaining 9 empty piles – these are all face-up. Next you deal the second set of 13 cards on top of and slightly overlapping the bottom card, and repeat this two more times – each pile should have 4 cards in it when finished dealing.

The goal of the game is to move all of the 52 cards from the *Tableau* into the *Foundations*.

The *Foundations* are built up by suit and rank, from Ace to King. So the first cards that go into the *Foundations* will be Aces; one Ace per *Foundation* pile. Cards of the same suit may be played on each Ace in ascending order, from low (2) to high (King). You may also move the top card in any of the *Foundations* piles back to the *Tableau.*

The *Tableau* is built down by rank. If a card is uncovered, (i.e., the top card), the next-lowest card of any *Tableau* pile may be moved to the top of a tableau pile, regardless of suit or color. For example, *the 9 of hearts can be played on either the 10 of diamonds, 10 of clubs or 10 of spades.* You may only move the top card in any of the 13 piles. You may NOT move a card into an empty *Tableau* pile. Once again, each of the 4 Kings is placed at the bottom of 4 of the 13 *Tableau* piles during dealing.

You are to analyze, design, implement, and test the whole system that will set up this game. Your game must be graphical, your game must allow a card to be moved into another pile, your game must be smart enough to know the rules of the game (i.e., a pile must know if the card that is trying to move to it is **allowed** to move there or not, and accept the new card accordingly). So if you try to move the 3 of Diamonds onto the 2 of Clubs in the Clubs *Foundation* pile, that pile will not allow the move – it will return the card to where it was coming from.

There are additional features of the game that you may want to include in your design, such as Undo Move, a Timer, Deal New Cards to start the game over, a Move Counter, Restart Current Game, and others. As your client, I would enjoy these features, but ONLY after a working game has been built. These are "nice features" but not required features, so do not include them in your project from the beginning. You may however, think about

HOW they might be designed in, and build your system with these extensions in mind. After you have the basic game playing, you may add these "nice features" for extra credit.

Deliverables

The following represents the physical documentation you must submit to support your system. All deliverables are due on the specified date at 4:30PM – the beginning of class. Do NOT miss class or come in late because of poor planning. Late work will negatively affect your grade.

I. Project Plan: The project plan must consist of the following components:
    1. Plan Part 1: Scope, and Team Organization (including resumes of the team members) – 9 points
    2. Plan Part 2: Schedule (including work breakdown structure, a list of milestones, and a Gantt chart), and Test plan – 9 points

II. Requirements Documents: The requirements documents will consist of the following:
    1. Use Cases: Diagram(s) and Flow-of-Events for each Use Case – 9 points
    2. Requirements Specification Document: Organized list of written requirements, and Test Specification (based on Use Cases) – 12 points
    3. Paper prototype (a drawing of your screens showing the flow from one screen to the next -based on Use Cases) – 3 points
    4. Prototype Demonstration – Each team will have 7 minutes to demo their "somewhat working" prototype; this is for validating the requirements – 3 points

III. System Design Documents: The system design documents will consist of the following:
    1. High-level design (UML class diagram of your system with

attributes, methods, and relationships – no data types) – 20 points

    2. Conceptual system design (including screen shots with either Use Case steps covered or Requirements covered on each screen) – 8 points

    3. Technical design (low level design - detailed class diagram(s) with all methods, attributes, relationships, and multiplicity defined) – 8 points

IV. Project Presentation: The system must also be ***working and demonstrated*** to the class. Final deliverables include:

    1.   Project Demo (Each team will have 15 minutes to demonstrate their project). We will draw numbers for presentation dates – 9 points

    2. Test Specification Document (identifies the results of your system tests, and the final percentage of passed test cases) – 5 points

    3. Additional Documentation: Throughout the entire project, each of you must keep track of the time you spend on the project - (Individual Time Sheet), and each Team must take Minutes of each meeting (those held within class as well as any meetings held OUTSIDE OF CLASS), including attendance. The Project Lead must submit these documents (Individual Time Sheets with Totals, and Meeting Minutes), on the day your team presents – 5 points

    4. Extra credits might be given to the teams who have the whole prototype implemented.