Date: **MON 23 MAR**

CISC 193 – C#

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**PROGRAM #2: JUST CONCENTR8**

**=== DUE MON 13 APR === (10 GRADES – NO EXTENSIONS / NO FIXES!)**

**===============**

**0 –** First, read this Task Sheet!

Second, put a check mark by each Task number and letter when you complete it. Third, hand in your hardcopy and Green Grade Sheet in your personalized folder when you complete this PROGRAM..

**1 –** **READ**: **TDHs and TDB**

**2 –** **PROGRAM OBJECTIVES**

* Design a C# program to integrate streamlined, custom methods with parameters
* Implement an effective shuffling algorithm
* Demonstrate the dynamic interplay of a two-player game with efficient re-use of methods
* Create multiple forms with information passed among them

**3 – SPECIFICATIONS**

Extend your PROGRAM #2.CP, a version of the ancient “Concentration Game”. Here, we will have a series of 4 pairs of matching “cards” displayed in an engaging way “face-down”. This time, two players will vie to collect points by finding matching pairs, with the game winner being the one who collects 3 points by finding 3 matching pairs. If each player obtains 2 points, we have a tie. Players will alternate in turning over two cards until the game ends in a tie or with a victor. Then, the players will have the option to play another game (and another and another . . .) OR to quit this foolishness.

Create a project called ***Larry***s**Concentr8**. In your amply sized form (use as much real estate as you can, like 1280 x 1024), provide the following three forms:

1. A **“splash page” form** entitled “Welcome to Larry’s Concentr8!” that displays a captivating and enticing message to encourage the user to play Concentr8. Use engaging graphics/images with a big, bold, beautiful and legibly colored font.
2. A **“welcome” form** to greet the user with effective graphics and text along with

* A prominent display of the **game name** “Larry’s Concentr8”
* The current **date and time**
* An **instruction** button that when clicked displays a message box showing the instructions for using this application
* A **login** textbox for the user to enter a valid account number (= 1111 for Albert Einstein, 2222 for Madame Curie, 3333 for you and 4444 for someone you admire). After entering the account number, check to see if it is valid. If it is, acknowledge it with a friendly message that displays the user’s account number and name. If it is not a valid account number, display a friendly “error” message that the entry is not valid and prompt user to re-enter the information. Play an upbeat, approving sound when the player enters a valid account number and a disapproving sound otherwise.

**STAR: Have the login occur in another form with compelling graphics and text**

**STAR: If the player re-enters invalid information three more times, then display a message that the application will terminate and then activate the “Exit” button**

**STAR: Expand the previous STAR to display a message that warns the player when there is only one more chance to enter the correct account number. Keep track how many times the player’s account number is invalid and display it after the player finally enters a valid number**

**STAR: Add a “password” feature – with “concentr8” and “master” as the two valid passwords. Handle valid and invalid data in reasonable ways. Proceed only if both the account number and the password are valid.**

**STAR: Give the user the option to change the password and use it in the subsequent login.**

**STARS (2): Maintain a “database” on disk of all valid account numbers and associated account holders’ names**

**STAR: Add a feature to the previous STAR to add entries to the database for new account holders**

* After successful login, have user enter the **aliases** of the two players
* On each side of the game name, “Larry’s Concent8”, have a timer **animation** displaying the four “cards” in the card order of 1-2-3-4 in a picture box on one side and 4-3-2-1 in a picture box on the other side
* An **exit** **button** which displays a friendly **farewell** message thanking and saying farewell to the user by account name, displaying the number of games played and the total number of games won and tied by each of the two players, congratulating the overall champion by name (or both if they have won the same number of games) and playing a farewell sound or music in message box.
* After closing the farewell message box, display another message box (or more) with your **ID INFO**, **CREDITS** (of whom you helped, who helped you as well as any tutorials, websites, etc. used) and **MEDIA**. In **MEDIA** have a **GRAPHICS** section and an **AUDIO** section. Include 3 types of info in these two sections: A brief description or title of the resource, your actual file name for the resource AND the specific URL for locating the resource.
* **IF you did any STARs, THEN display one final message box to briefly identify in a numbered list which STARS you completed AND your total number of STARS.**

**NOTE: You can earn STARS only for those which are numerically listed in this MessageBox along with the TOTAL NUMBER**. **Display your STARS in the following format:**

**PROGRAM #2 STARS**

1. **Early demo**
2. **Extra pizzazz – (and describe what you did)**
3. **Blah-blah-blah**

**TOTAL STARS = 3**

* Then close the program

**STAR: Have the exit button farewell information displayed NOT in a message box, but in another form with big, bold and beautiful fonts, colors and graphics**

**STAR: Expand the previous STAR to include the ID INFO, etc.**

**STAR: Expand the previous STAR to display the elapsed time in minutes & seconds**

**STAR: Instead of closing the application, use a message box with a YES/NO choice to ask the user about continuing playing another game**

1. After successfully logging in, proceed to the **“play” form** which contains:

* A display of an effective **background image** on the form to harmonize with the theme of the “cards”
* A **thank you** message with the two players’ aliases
* **8 picture boxes** to hold the four pairs of “cards” face down
* A **“toggle” button for displaying / hiding** all the cards where “Display” appears on the button when all 8 cards are “face down” and “Hide” appears on the button when all 8 cards are “face up”; when Display is pressed, all 8 cards appear “face up”; when Hide is pressed, all 8 cards appear “face down
* A **shuffle** **button** that rearranges the cards (while they are face up and/or face down) by means of a “perfect” shuffle. Here, picture boxes 1 – 8 are divided into two groups, 1 – 4 and 5 – 8, and the images are “interleaved” into the picture boxes. E.g., the images in picture boxes 1, 2, 3, 4, 5, 6, 7 and 8 are replaced by the images in picture boxes 5, 1, 6, 2, 7, 3, 8 and 4 respectively

**STARS (3): Have the shuffle button reveal 3 radio buttons each of which implements a different shuffling algorithm with one the “perfect” shuffle**

* A **cut** **button** that prompts the user to enter a number from 0 – 7. This number is the number of cards removed from the “top” as a block and put in the same sequence at the “bottom” of the deck. E.g., if the cut number is 3, then the images in picture boxes 1, 2, 3, 4, 5, 6, 7 and 8 are replaced by the images in picture boxes 4, 5, 6, 7, 8, 1, 2 and 3 respectively. Restrict the cut “number” to a reasonable amount. When necessary, do “error-checking” on the cut number and handle effectively data out of range.

**STAR: Add a “random cut” button that after the user selects a cut number will randomly add/subtract appropriate numbers from the cut number**

* The same **exit** **button** as in the **welcome** form
* A **play** **button** that:
  1. “Removes” unnecessary items
  2. Puts all the cards “face down”
  3. Prominently displays the **current game number** (starting at #1), **each player’s alias with the number of successful matches for each player in the current game (STAR: Also include the number of mismatches for each player and their successful match percentage to one decimal place)**
  4. Lets the players play the game with player #1 going first and clicking on two face-down cards which get turned face-up with a message indicating if there is a match or a mismatch. Play an upbeat sound for a match and a downbeat one for a mismatch. Also, update the successful match count. After a match/mismatch, the other player selects the two cards

**STAR: Instead of the players alternating in moves, the player who gets a match can continue playing until a mismatch or the game ends**

**STAR: Incorporate two radio buttons (or some other means) to let the player choose to play either the way of the previous STAR or the way of always alternating the moves**

* 1. Has the game ends with the names of the winner and loser announced if one player has 3 matches, otherwise, a tie is declared with the players’ names.
  2. Displays a **play again button** after a game ends to reset the form for the next game to be played. OR, just use the play button to accomplish this.

1. Declare, define and deploy **lots of non-event driven, custom-methods**. Aim to create methods that have at most 25 or so lines of code (excluding comments)
2. **DO NOT USE global variables** for information appearing only in non-event driven methods

**STARS(2): Create custom-designed classes for accommodating global variables and associated methods**

**4 – SCREEN OUTPUT**

You have artistic license to create whatever is effective and dazzling

**5** – **SAVE** your file early and often -- like every 5 minutes. And, use your backup "disk"

**6** – **TEST** your file early and often -- like every 5 minutes -- How do you eat an apple?

**7** – **MICHELANGELO PROGRAM DOCUMENTATION**

1. First, include in your C# code (Form1.cs\*) of EACH FORM via comments your complete **ID INFORMATION, PROGRAM DESCRIPTION**, separate **NON-EVENT** and **EVENT-DRIVEN CUSTOMIZED-METHODS** lists (in alphabetical or other order of ONLY the customize methods declared in the form), **CREDITS** (to those who helped you and whom you helped) and **MEDIA** (all graphic and audio resources with specific URLs).
2. Before each method “signature”, include a distinguishing "border/banner" containing the:

* **NAME** of the method
* **DESCRIPTION** of the method's purpose that connects with all the parameters and clearly indicates what data is returned
* **For non-event driven methods also add a:**

**CALLS** list of all the methods being called/deployed in the method and **a CALLED BY** list of all the methods that call/deploy the current method

1. Add “banners” for all your constant declarations/definitions and all your variable declarations – all of which appear at the beginning of a section/method with constants appearing first.
2. Use identifiers for constants, variables, etc. that are self-explanatory. No abbreviations, code names or “magic numbers”. Use verbs for naming methods and nouns for variables and CONSTANTS!
3. Include a “START CUSTOMIZED METHODS” banner at beginning and add an “END CUSTOMIZED METHODS” banner at the end. Keep all the non-event driven methods in one section and event driven methods in another with “START” & “END” banners for each sections of methods.
4. Within each method add comments to describe "highlights" of any coming attractions. Insert at least one blank line before each of these comments.
5. Provide comments to describe special code. unusual features and any STARs
6. Add inline credits to honor those who helped you with that part of your code

**8** – **DEMOS** **– 10 GRADES**

1. **CLASS DEMO OF MULTI-FORMS WITH PARAMETERS (1 GRADE)**
2. **CLASS DEMO OF WORK-IN-PROGRESS (1 GRADE)**
3. **CLASS DEMO – On podium computer showcasing to class (6 GRADES)**
4. **YOUR FULLY DOCUMENTED PROGRAM (1 GRADE)**
5. **HARDCOPY OF MANAGER’S REPORT (1 GRADE)**

**A is DUE WED 25 MAR**

**B is DUE MON 6 APR**

**C is DUE MON 13 APR**

**D and E DUE WED 15 APR**

**STARS (2): Demo completed program, C, before due-date**

**STAR: Hand in D and E before due-date**

**9** – **HAND IN HARDCOPY** – **MANAGER’S STATUS REPORT**

**Manager’s Status Report** – Word process with at least one good-sized **titled** paragraph for each answer **(1-5)**, **along with relevant and effective clip art for each paragraph:**

1. **HURDLES**: Identify any relative hurdles, challenges and frustrations you encountered in C# on this PROGRAM and describe how you dealt with them.
2. **PRIDE**: Identify a part of the PROGRAM that you were proud of completing. Explain what you learned from it and why you were proud
3. **HELPED OTHERS**: Describe how you helped others on this PROGRAM. Give details. If you did not help anyone, then have someone demo 1-on-1 their project and describe what you liked about it and your suggestions for enhancing it. Give the name(s) of the student(s) for either situation.
4. **HELPED BY OTHERS:** Describe how you were helped by others on this PROGRAM. Give details. If you were not helped by anyone, then have someone demo 1-on-1 your project and describe what he/she liked about it and his/her suggestions for enhancing it. Give the name(s) of the student(s) for either situation
5. **STARS:** Briefly identify in a numbered list each **STAR** you did **and** display the **total number of** **STARS**
6. Include your **TASK TIMESHEET** with the accurate, completed information
7. Include printout of TASK #8 AND #9

**10** – **STARS:**

* 1. Any STARS from **PROGRAM #2.CP** – but NO DOUBLE-DIPPING!!
  2. Produce an imaginative, eye-catching Manager’s Report
  3. Add a time constraint so that the game automatically ends by that time.
  4. Display how much time each player has used during game-play
  5. Expand the previous STAR by putting a reasonable time-limit on each player. If a player exceeds the time-limit, then the player loses the game
  6. Prompt the players to decide which player goes first
  7. Offer an option to also play one player against the “computer”, which perfectly remembers all the cards it has “seen” during play
  8. Have a button which lets a player select which images – from a designated list – that will be used for the initial 8 “cards”
  9. When a player wins a game, play in interesting “victory” timer animation
  10. Display the start date and time and the end time at exit, and the number of minutes and seconds transpired
  11. Display the running time in minutes and seconds as the game is played
  12. Have a history button that displays the history of the game moves, like picture boxes were selected in the following order: Player#1 -- 3 and 5 produced no match, Player #2 -- 3 and 1 produced a match, etc.
  13. **(MUCHO STARS)** Add an “instant replay” feature for the game
  14. Generate all the picture boxes during run-time, not in design mode
  15. Add extra pizzazz and describe what you did
  16. Invent your own ideas for enhancing the gameplay of Concentr8– like add an extra “box” for the game and if its image is selected, the player loses – and implement them, but be sure to okay them with me

**The greater danger for most of us lies not in setting our aim too high and falling short; but in setting our aim too low, and achieving our mark.**

**Michelangelo**

**To achieve great things, two things are needed; a plan, and not quite enough time.**

**Leonard Bernstein**

**You must do the thing you think you cannot do.**

**Eleanor Roosevelt**

