**University of Technology, Jamaica**

**CMP2006 - Data Structures**

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| **Facilitator(s):** | **Mr. P. Smith** | | |
| **Assessment:** | **Group Assignment (Must be between 3 & 4 ppl and from the same lab session. No exceptions)** | | |
| **Given Week:** | 7 | **Due Week:** | **12** |

A Game of Go Fish



Microsoft Card Games is interested in introducing Go Fish as another card game to be installed by default on Windows PCs. It has devised a student competition to help with the initial game design. Game Design requires much efficiency as such, they are also interested in the choice of data structures and efficiency of the algorithms used throughout the game.

Rules of the Game:

1. The game consists of fifty-two (52) cards that are shuffled (randomized) at the beginning of a game
2. Each player (two players - the human player and computer (AI)) starts the game with four (4) cards from the deck
3. The game should then prompt the user for Heads/Tails before simulating the flipping of a coin. If the user’s choice of Heads/Tails is selected, the user should be allowed to choose which player (user/computer) goes first. Otherwise, the Computer will choose to go first.
4. The user with the most pairs of cards at the end of the game wins

Gameplay:

The player will have the opportunity to play Go Fish against the Computer. Each player will aim to get pairs (a pair is also known as a ‘book’ and it consists of two cards of the same value eg. two seven’s (7) ) of cards either by asking the other player if a card they currently have is in the other player’s hand. If the card is in the other players hand, the player who asked will collect both cards and add the pair to their personal deck before asking the other player for another card. If the other player did not have the card requested the player must take a card from the top of the deck and place in their hand. If the card (taken from the deck) is the same card that the player just requested from the opponent, the player may add the pair of cards to their personal deck and ask the other player for another card. If the player has 2 cards which could make a pair in their hand, they may add this pair to their personal deck also.

A player’s turn ends when the card they asked for is not in the other player’s hand and they did not draw the same card number from the deck. Whenever a player’s hand is empty, they are allowed to draw four (4) additional cards from the deck until it is empty.

The computer AI should not simply keep requesting the first card in its hand but should choose randomly between the options in its hand.

The player with the most personal sets of pairs (largest personal deck) at the end of game wins. When a game ends the user should be prompted if they would like to play again.

Simulation of actual gameplay:

**Video:** <https://www.youtube.com/watch?v=hRpXLSMdve0>

***Please note your game should begin with four (4) cards and players only need two (2) cards to make a pair/book***.

## Submission Guidelines

If you choose to submit a video, it is recommended that a link to the video by provided (eg. YouTube or a file sharing service where it can be downloaded)

## Submission

**Due date: Week 12**

The email subject and report should be saved as:

the initials of the FirstNamesOfMembers\_DsGroupProject

Eg. If the four members of the group have first names, *Sarah, Dario, Sam and Marcus* the subject of the email should be:

SDSM\_DsGroupProject

And the written report should be saved as

SDSM\_DsGroupProject.docx or SDSM\_DsGroupProject.pdf

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## Late Submission

If the project is submitted to lecturer after the due date the evaluation interview may still be conducted based on the discretion of the lecturer, but a penalty is attracted for every late day. Each day after the due day (including Saturdays and Sundays) will attract a 10% penalty, which will be deducted from the total mark of project.

## Interviews

Presentations will be conducted after the due date – i.e. In week 13. Absence from the interview will result in 0%. The timetable of presentation will be generated by your lab tutor. It is recommended that each developer should be responsible for some section of the project. However, each developer must be familiar with **ALL** parts of project.

## Marking Scheme Breakdown

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| --- | --- | --- | --- | --- | --- |
| # |  | **Project components** |  | **Marks** | **Actual Marks** |
| 1 |  | *Documentation*   1. *Group Report*     * *Details of each member’s contribution*    * *Which data structure(s) were used and why*    * *Declaration of Authorship for each member*    * *Worst case Asymptotic Analysis of each key functions* 2. *Application User Manual* |  | 15 |  |
| 2 |  | *Exception Handling* |  | 5 |  |
| 3 |  | *Code comments & practices* |  | 5 |  |
| 4 |  | *Appropriate User Interface* |  | 5 |  |
| 5 |  | *Game Play (AI, new game, win/lose game)* |  | 25 |  |
| 6 |  | *Game Initialization (shuffle deck, deal cards, Coin flip)* |  | 25 |  |
| 7 |  | *Utilize appropriate data structures for respective features & functionality* |  | 20 |  |
|  |  |  | ***Total:*** | **100** |  |