THE ICT UNIVERSITY

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ICT DEPARTMENT

LEVEL I

GROUP II

SPRING 2022

OBJECT ORIENTED PROGRAMMING WITH C++

FINAL EXAM PROJECT

CARD GAME IN C++ USING OOP APPROACH

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WHAT WAS EXPECTED TO DO?

In order to apply the all concepts that we learned so far in OOP with C++ (**classes, objects, arrays, arguments, sorting algorithms, separate compilation, etc..**) in a practical project, we have been asked to develop a simple Card Game using OOP approaches in c++.

To play the game, three main elements are needed:

❖ **THE DECK**: The deck is made up of 52 cards, divided in to four sets. The sets are: **SUITS, SPADES, DIAMONDS AND HEARTS**. Each card is characterized by its worth or value, its suite, its color and its name.

❖ **THE HUMAN PLAYER**: The human player is basically the person that plays the game. He/she should have a set of 5 cards (Hand) that will be randomly picked from the deck and given to him/her when the game starts. If he/she is not satisfied with the generated card, an option to change the cards should be given to him until he/she is satisfied.

❖ **THE COMPUTER**: The human player plays versus the computer. But contrary to the human player, the computer doesn't have an option to change its hand of cards.

When the Game starts, the hand of the computer and the human player are compared. If the player has a total card value greater than that of the computer, he should be announced as the winner of the game. But if the player's total card value is less than that of the computer, he should be announced as the loser. A draw can also occur if both have total card values equal.

THE SOLUTION WE PROPOSED

We first of all started by coming out with the characteristics of each entity of the application.

❖ **Player**: The player is characterized by his **name, number of wins, number of loses, high score and hand**. He can change his hand of cards as many time as he wants **until he is satisfied** with the given hand of cards.

❖ **Card**: Each card is characterized by its **name, worth and suit** (from where we can also deduce the color).

❖ **Deck**: the deck is the collection that **contains all the 52 cards of the game**. We can whether pick a card inside the deck or a hand (set of 5 cards).

This is how the game works (logically):

❖ It requires a player (the user) and the computer. The game starts when the player is satisfied with the hand of 5 cards that have been randomly picked from the deck and given to him.

❖ The user has the **possibility to change the first 5 cards that have been given to him** to a new hand that is taken from the deck. The computer's cards are only displayed only once the player has made the choice to keep his cards (to avoid cheating).

❖ Once both players have their hands ready, their hands are compared and the one with the highest total value of points is announced as the winner.

DEMO

After running opening the game, this main interface will be displayed

The user has the possibility to read the game rules before playing. If he chooses option 4, he/she will see this following interface

```
1. The goal in Game cards is to beat the computer's
        hand with a hand of greater worth
        (sum of cards in the hand)

2. Gallery provides you with deck, color and value of cards

3. Pressing C asks for another hand of cards. Pressing other
keys holds your total(hand) and end your turn.

4. Your name is required before the start of the game.

5. A lower hand worth means you lose the game

   _ (Press any key to continue)
```

The user can also view the gallery (deck) to understand the worth and suite of each cards with the option 5.

If the player choses the first option, he will be greeted with an interface demanding his nickname. Once validated, the game starts.

As expected, when the game starts 5 cards are picked from the deck and given to the player. But if he/she is not satisfied, she/he can change his cards by pressing 'C' or

'c'

```
                   Enter your nickname: bravo

                        Name: bravo      Rounds played: 0      Wins: 0        Loses: 0
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YOUR CARDS:

KING_OF_SPADE  QUEEN_OF_DIAMOND      9_OF_SPADE      QUEEN_OF_SPADE  5_OF_HEART
.------.       .------.          .------.        .--[--.          .------.
|K.--. |       |Q.--. |          |9.--. |        |Q.--. |         |5.--. |
| :/\: |       |  //  |          | :/\: |        | :/\: |         | (V)  |
| :/\: |       |  //  |          | :/\: |        | :/\: |         | (V)  |
| '--'K|       | '--'Q|          | '--'9|        | '--'Q|         | '--'5|
'------'       '------'          '------'        '------'         '------'
Worth:13(black) Worth:12(red)    Worth:9(black)  Worth:12(black)  Worth:5(red)    Press C to change hand or any other key to continue: c
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YOUR CARDS:

2_OF_CLUB      8_OF_HEART      9_OF_HEART      5_OF_DIAMOND    4_OF_DIAMOND
.------.       .------.        .------.        .------.        .------.
|2.--. |       |8.--. |        |9.--. |        |5.--. |        |4.--. |
| :(): |       | (V)  |        | (V)  |        |  //  |        |  //  |
| :(): |       | (V)  |        | (V)  |        |  //  |        |  //  |
| '--'2|       | '--'8|        | '--'9|        | '--'5|        | '--'4|
'------'       '------'        '------'        '------'        '------'
Worth:2(black)  Worth:8(red)   Worth:9(red)    Worth:5(red)    Worth:4(red)    Press C to change hand or any other key to continue:
```

After he is satisfied with his hand, the computer's cards are now picked randomly from the deck and revealed to the player.

```
YOUR CARDS:

JACK_OF_CLUB   6_OF_HEART      QUEEN_OF_SPADE  QUEEN_OF_DIAMOND     9_OF_DIAMOND
.------.       .------.        .------.        .--[--.          .------.
|J.--. |       |6.--. |        |Q.--. |        |Q.--. |         |9.--. |
| :(): |       | (V)  |        | :/\: |        |  //  |         |  //  |
| :(): |       | (V)  |        | :/\: |        |  //  |         |  //  |
| '--'J|       | '--'6|        | '--'Q|        | '--'Q|         | '--'9|
'------'       '------'        '------'        '------'         '------'
Worth:11(black) Worth:6(red)   Worth:12(black) Worth:12(red)   Worth:9(red)    Press C to change hand or any other key to continue: o
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COMPUTER'S CARDS:

8_OF_DIAMOND   JACK_OF_SPADE   6_OF_SPADE      ACE_OF_HEART    10_OF_CLUB
.------.       .------.        .------.        .------.        .------.
|8.--. |       |J.--. |        |6.--. |        |A.--. |        |X.--. |
|  //  |       | :/\: |        | :/\: |        | (V)  |        | :(): |
|  //  |       | :/\: |        | :/\: |        | (V)  |        | :(): |
| '--'8|       | '--'J|        | '--'6|        | '--'A|        | '--'X|
'------'       '------'        '------'        '------'        '------'
Worth:8(red)    Worth:11(black) Worth:6(black) Worth:1(red)    Worth:10(black) Appuyez sur une touche pour continuer...
```

After that, the round 1 starts. Each pair of cards (PLAYER'S CARD, COMPUTER'S CARD) are compared. And the total values of the cards are also compared. If the total value of the player's hand is greater than that of the computer, the player wins otherwise he loses the round. But a draw round can also occur if the hand's values are equal.

```
------------------------PLAYING ROUND 1----------------------

JACK_OF_CLUB ( 11 )   ------------ VS -------------- 8_OF_DIAMOND ( 8 )  ==> JACK_OF_CLUB WINS! (YOU WON)
                                    [  ]
6_OF_HEART ( 6 )   ------------- VS -------------- JACK_OF_SPADE ( 11 )  ==> JACK_OF_SPADE WINS!

QUEEN_OF_SPADE ( 12 )   ------------ VS -------------- 6_OF_SPADE ( 6 )  ==> QUEEN_OF_SPADE WINS! (YOU WON)

QUEEN_OF_DIAMOND ( 12 )   ------------ VS -------------- ACE_OF_HEART ( 1 )  ==> QUEEN_OF_DIAMOND WINS! (YOU WON)

9_OF_DIAMOND ( 9 )   ------------ VS -------------- 10_OF_CLUB ( 10 )  ==> 10_OF_CLUB WINS!
                                    [
             YOU ( 50 POINTS)   ------------ VS -------------- COMPUTER( 36 POINTS)
```

YOUR STATISTICS...

Name: bravo   Rounds played: 1   Wins: 1   Loses: 0

At the last round, the final winner is announced.

Name: boss   Rounds played: 3   Wins: 3   Loses: 0
-------------- FINAL STATISTICS------------------