CIS7 Project Documentation Guide

In the documentation, provide at least 2 pages (single-space) that contains the following components of your course project:

1. Team name, members.
    a. Haseeb Muhammad
2. Project Information and details: (30 points)
    - What problems are you solving in this project?
        - We are creating a program to simulate a blackjack game between a dealer and a player. The problems to this project include:
            - Mapping the card strings and values
            - Conditional statements
            - Dealer vs player outcomes
    - What solutions are you implementing in the project?
        - The implementations of our problems include:
            - We are mapping the cards strings and values to a position in a 2-dimensional array.
            - The conditional statements are implemented as finite state machines.
            - We need to implement a second layer of conditioning that covers both player and dealer outcomes.
    - Provide explanation of calculations and algorithm implementation.
        - Addition calculator
        - Comparator algorithm
    - What is the program objectives? Explain how your program is interacting with the user and its purpose.
        - The purpose is to make a blackjack simulator. User will enter a value when prompted and the algorithm will additionally ask user to stay with current values or “hit”. Then the user will have an outcome where values of cards will be compared to dealer. If the user has greater value, user wins and vise-versa for dealer.
    - How are discrete structures implemented in the C++ program?
        - We are using a discrete structure implemented as an array as a reference for card values and strings.
    - What are the limitations of the program?
        - It is only bound by an individual (Dealer vs Player) Blackjack traditional ruleset.
    - Provide recommendation on improving the limitations of the program.
        - Add more players to give the game a layer of complexity, strategy, and statistical relevance.

3. Flowchart OR Pseudocode. (30 points)Write the pseudocode for the program, from start to finish. Be sure to include decision-making branching.

1. code a deck of cards using an array and assigning a value for each card (Total Cards = 52):
    a. ***Potentially a header file*** Can be a function call
    b. 4 suits (Diamond, Hearts, Spades, Clubs)
    c. 1 – 10 for each suit… forty cards
    d. Jack, Queen, King, Ace for each suit… 12 cards
    e. Cards are exclusive.
2. Assign two cards randomly using the rand function in C++
    a. Start of game after dealing 2 cards:
        i. Console outputs players cards and additive number
        ii. Console outputs dealers face up card.
            1. If dealer has blackjack… they win
            2. If you hit blackjack… you win
            3. If both hits blackjack… game restarts
    b. If game continues… Meaning no one has hit blackjack.
        i. First player hits or stays.
            1. Offer analytics of probability based on the chart below before and after a card is dealt. This probability guide offers insight to player to give a competitive edge.

Player hand	Dealer's face-up card									
	2	3	4	5	6	7	8	9	10	A
Hard totals (excluding pairs)										
17–20	S	S	S	S	S	S	S	S	S	S
16	S	S	S	S	S	H	H	SU	SU	SU
15	S	S	S	S	S	H	H	H	SU	H
13–14	S	S	S	S	S	H	H	H	H	H
12	H	H	S	S	S	H	H	H	H	H
11	Dh	Dh	Dh	Dh	Dh	Dh	Dh	Dh	Dh	Dh
10	Dh	Dh	Dh	Dh	Dh	Dh	Dh	Dh	H	H
9	H	Dh	Dh	Dh	Dh	H	H	H	H	H
5–8	H	H	H	H	H	H	H	H	H	H
Soft totals										
	2	3	4	5	6	7	8	9	10	A
A,9	S	S	S	S	S	S	S	S	S	S
A,8	S	S	S	S	Ds	S	S	S	S	S
A,7	Ds	Ds	Ds	Ds	Ds	S	S	H	H	H
A,6	H	Dh	Dh	Dh	Dh	H	H	H	H	H
A,4–A,5	H	H	Dh	Dh	Dh	H	H	H	H	H
A,2–A,3	H	H	H	Dh	Dh	H	H	H	H	H
Pairs										
	2	3	4	5	6	7	8	9	10	A
A,A	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP
10,10	S	S	S	S	S	S	S	S	S	S
9,9	SP	SP	SP	SP	SP	S	SP	SP	S	S
8,8	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP
7,7	SP	SP	SP	SP	SP	SP	H	H	H	H
6,6	SP	SP	SP	SP	SP	H	H	H	H	H
5,5	Dh	Dh	Dh	Dh	Dh	Dh	Dh	Dh	H	H
4,4	H	H	H	SP	SP	H	H	H	H	H
2,2–3,3	SP	SP	SP	SP	SP	SP	H	H	H	H

2. Hitting will be recursive until player stays or busts
    a. if busts, dealer wins and game is over.
    b. If stays, wait for dealer then compare

ii. Then Dealer hits or stays?
1. Hitting will be recursive until dealer wins or busts?
    a. If busts, player wins
    b. if dealer beats players number, then dealer wins