Benjamin Bladow, Brandon Niblock, Eugene Krug

Gonzaga Men's Basketball Yahtzee
Business Function Model and Functional Requirements

For clarity purposes, "user" refers to the people playing this game and "player" refers to a Gonzaga Men's Basketball Player.

Business Function Model

<u>Objective</u>: Play a multiuser game of Gonzaga Men's Basketball Yahtzee in a Graphical User Interface (GUI).

- Start a new game
    - Display the leaderboard (top 3 highest scores in game history)
    - Display instructions and rules
    - Determine number of users
    - Get the user's name(s)
    - Set up empty scorecard(s)
    - Display dice before rolling
- Roll a hand
    - Roll all five dice
    - Determine if rerolls are available
    - Prompt the user to keep dice
    - Reroll dice not kept
    - Determine whether to proceed to scoring
        - Determine if all dice have been kept
        - Determine if all available rolls have been used
- Score a hand
    - Determine which scorelines are unused
    - Calculate the score for each unused line
    - Display the calculated scores to the user as possible scoring options
    - Prompt the user to select a scoring option
    - Record the score of selected option on the appropriate scorecard line
    - Display a scorecard
        - Display the score for each upper scorecard line
        - Calculate and display the total of upper scorecard lines
        - Determine if a bonus was achieved
        - Calculate and display the total of upper scorecard lines including bonus
        - Display the score for each lower scorecard line
        - Calculate and display the total of lower scorecard lines
        - Calculate and display the grand total
- Finish a game
    - Determine whether any scorecard lines remain unused
    - Display final scorecard when all scorecard lines have been used (per parameters outlined above)
    - Determine whether the user's score qualifies them for the leaderboard
    - Add their name and score to the leaderboard if applicable
    - Ask the user if they would like to play again
    - Start a new game if appropriate

Functional Requirements

To start a game:

     At the start of the game, the leaderboard (top 3 highest scores in game history) is displayed. The instructions of how to play will be displayed, as well as each player's name, their number, their position, and if they are a starter or bench, as this is key to scoring for the rest of the game. The user will then be prompted to input the number of users for this game. Then, the user will be asked to input each user's name, and then their empty scorecard will be printed. The user will then see which user's turn it is, and then the number of sides and number of dice will be displayed, as well as the first user's first turn.

Roll a hand:

     To roll a new hand the first step is to roll all five dice, random generating five Gonzaga basketball players. After each roll, the game will tell the user how many rerolls they still have during their turn, then the game will prompt the user to select which players to keep in their hand, and which to reroll. The dice that are not kept will be rerolled. At this point, the turn will proceed to scoring if one of two conditions is met: either all of the dice have been kept, or all available rolls have been used.

Score a hand:

     After each turn the user is asked to select a scorecard line to choose. To score the hand, the program only allows the user to choose from unused lines. At any point during any turn of the game, the program needs to be able to display the scorecard thus far. Once all the lines have been used the entire scorecard is returned with totals for the upper and lower half. Then a grand total of the upper and lower half combined is printed.

Finishing game:

     To finish the game, the first step is to determine if any lines of the scorecard are empty. If none are empty, the user has used all their turns. The grand total is calculated for each user. Each user's final scorecard, along with their score from the upper and lower half, and their grand total is displayed. The game then compares the user's scores, and the winner is declared. Determine whether the user's score qualifies them for the leaderboard and add their name and score to the leaderboard if applicable. The users will then be asked if they wish to play again.