Grading Rubric

4 pts - **UML Class diagram** with classes/interfaces clearly defined with appropriate instance variables, methods and relationships identified.

2 pts – **UML Object diagram** with objects and their interactions identified.

2 pt – **UML Sequence diagram** with objects and sequence of interactions identified for scenario 2.

2 pts – **UML Sequence diagram** with objects and sequence of interactions identified for scenario 3.

Assignment

Develop a design for a Farkle game. (The rules are on the back side.)

For this design include your business object layer that will maintain the current state of the game. Remember these classes should be designed independent of the user interface. The classes that play the game should be re-usable with any user interface you wanted to create. Clearly indicate which classes are part of your presentation layer and which are part of the business objects layer.

You will also design a Graphical User Interface for the user to run the game:

1) Visually displays the dice.
2) Allows the user to select/deselect the dice to “hold”.
3) Allows the user to roll and re-roll.
4) Calculates the turn score and updates the game score.
5) Declares and presents a winner.
6) Allow the user to save and restore a game from last time.
7) View a leader board

Scenarios:

1. Create a new game with two players (Kirk & Spock) and a winning goal of 20,000 points.
2. Create a new game with three players (Kirk, Spock, and Bones) and a winning goal of 10,000 points.
3. Kirk rolls a 2-3-4-4-4-6, and scores the three fours for 400, and ends his turn.
4. Spock rolls a 2-3-4-4-4-6, and holds the three fours and rolls again. He rolls a 1-1-1 and gets 1000 points and then rolls all 6 dice again.
5. Bones rolls a 1-1-1-2-3-4, and holds the three ones and rolls again. He rolls a 3-4-6 and loses all his points.
6. Bones rolls a 1-1-1-2-3-4, and holds the three ones and scores 1000, putting his total points up to 10,500. (each other player gets one more turn and then the game ends).
Farkle Rules

The rules you will use are taken from Wikipedia:

Farkle is played by two or more players, with each player in succession having a turn at throwing 6 dice. Each player’s turn results in a score, and the scores for each player accumulate to some winning total (usually 10,000).

At the beginning of each turn, the player throws all the dice at once from a cup.

After each throw, one or more scoring dice must be set aside.

The player may then either end their turn and bank the score accumulated so far, or continue to throw the remaining dice.

If the player has scored all six dice, they have "hot dice" and may continue their turn with a new throw of all six dice, adding to the score they have already accumulated. There is no limit to the number of "hot dice" a player may roll in one turn.

If none of the dice score in any given throw, the player has "farkled" and all points for that turn are lost.

At the end of the player's turn, the dice are handed to the next player in succession (usually in clockwise rotation), and they have their turn.

Once a player has achieved a winning point total, each other player has one last turn to score enough points to surpass that high-score.

**Scoring:**

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