

## Project Overview

Develop a software application for the dice game called Farkle.

## Project Terms

The following terms and acronyms are defined and used within this document.

Term/Acronym	Definition
die	A cube where each side has a distinct single digit 1, 2, 3, 4, 5, or 6.
dice	Two or more die.
turn score	The score being accumulated during one player's turn.
total score	The score being accumulated during play of one game.

## Project Requirements

The project requirements include a description of the way in which the game is played and processing requirements. Please note that all of the project requirements are numbered so they can be referenced in your spiral plan (more on this when we get to assignment 8).

### *Game Description*

#### Equipment

1. Six dice.

#### Rules

2. Farkle is played by two or more players, with each player in succession having a turn at throwing the dice. Each player's turn results in a turn score, and the turn scores for each player accumulate to a total score. A total score of 10,000 or more wins the game.
3. A player's turn is as follows:
  - a. At the beginning of a player's turn, the player throws all of the dice at once.
  - b. After each throw, one or more scoring dice must be set aside (see *Scoring* below).
  - c. If none of the dice score in a throw, the player has "farkled". In this case the player's turn score is set to zero and their turn is over.
  - d. After each throw, the player may either end their turn or continue to throw the remaining dice.
    - i. When the player ends their turn, their turn score is added to their total score and their turn score is set to zero.
  - e. 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. This will add to the turn score they have already accumulated. There is no limit to the number of "hot dice" a player may roll in one turn.
  - f. 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.
4. 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**

5. The following table shows scores earned for single die or combinations of dice.

Scoring Rule	Dice Combination	Score
a.	Each 1	100
b.	Each 5	50
c.	Three 1s	1000
d.	Three 2s	200
e.	Three 3s	300
f.	Three 4s	400
g.	Three 5s	500
h.	Three 6s	600

For example, if a player throws 1-2-3-3-3-5, they could do any of the following:

- i. Score three 3s as 300 and then throw the remaining three dice.
  - ii. Score the single 1 as 100 and then throw the remaining five dice.
  - iii. Score the single 5 as 50 and then throw the remaining five dice.
  - iv. Score three 3s, the single 1, and the single 5 for a total of 450 and then throw the remaining die.
  - v. Score three 3s, the single 1, and the single 5 for a total of 450 and stop, adding their turn score (450) to their total score.
2. Note that this is not an exhaustive list of plays based on that throw, but it covers the most likely ones. If the player continues throwing, as in any of the above cases except the last, they risk farkling and thus losing all accumulated (turn score) points. On the other hand, if they score five dice and have only one die to throw, they have a 1 in 3 chance of scoring a single 1 or a single 5, and then having scored all six dice they will have "hot dice" and can throw all six dice again to further increase their turn score.
3. Also note that each scoring combination must be achieved in a single throw. For example, if a player has already set aside two individual 1s and then throws a third with the four remaining dice, they do not have a triplet of 1's for a score of 1000 but merely three individual 1's for a score of 300.