COMP101 LAB10

Requirements

Extend the ThreeDice.java file to include scoring and then build a game based around the class which keeps track of multiple users scores for each round of game and produces a winner and several stats for the game

Analysis and Design

My analysis of the problem is that I will need 3 additional classes above the given class, one class will use the threedice class to produce the scores achieved in the game, one will be responsible for the flow of the game and will execute the procedure for each round of the game and the final class will run the game and output the results.

Pseudo Code

Play round

INPUTS = NA

OUTPUTS = integer 2D array sized at players x 4

FOR number of players

      ROLL THREE DICE

      ADD TO ARRAY IN ORDER score, die1, die2, die3

END

RETURN ARRAY

Play Game

INPUTS = NA

OUTPUTS = integer 3D array sized at Rounds x players x 4

FOR NUMBER OF ROUNDS

      PLAY ROUND

      ADD RESULT TO ARRAY

END

RETURN ARRAY

GetRoundWinner

INPUTS = ROUND

OUTPUTS = INT(PLAYER)

TOPPLAYER = FIRST PLAYER
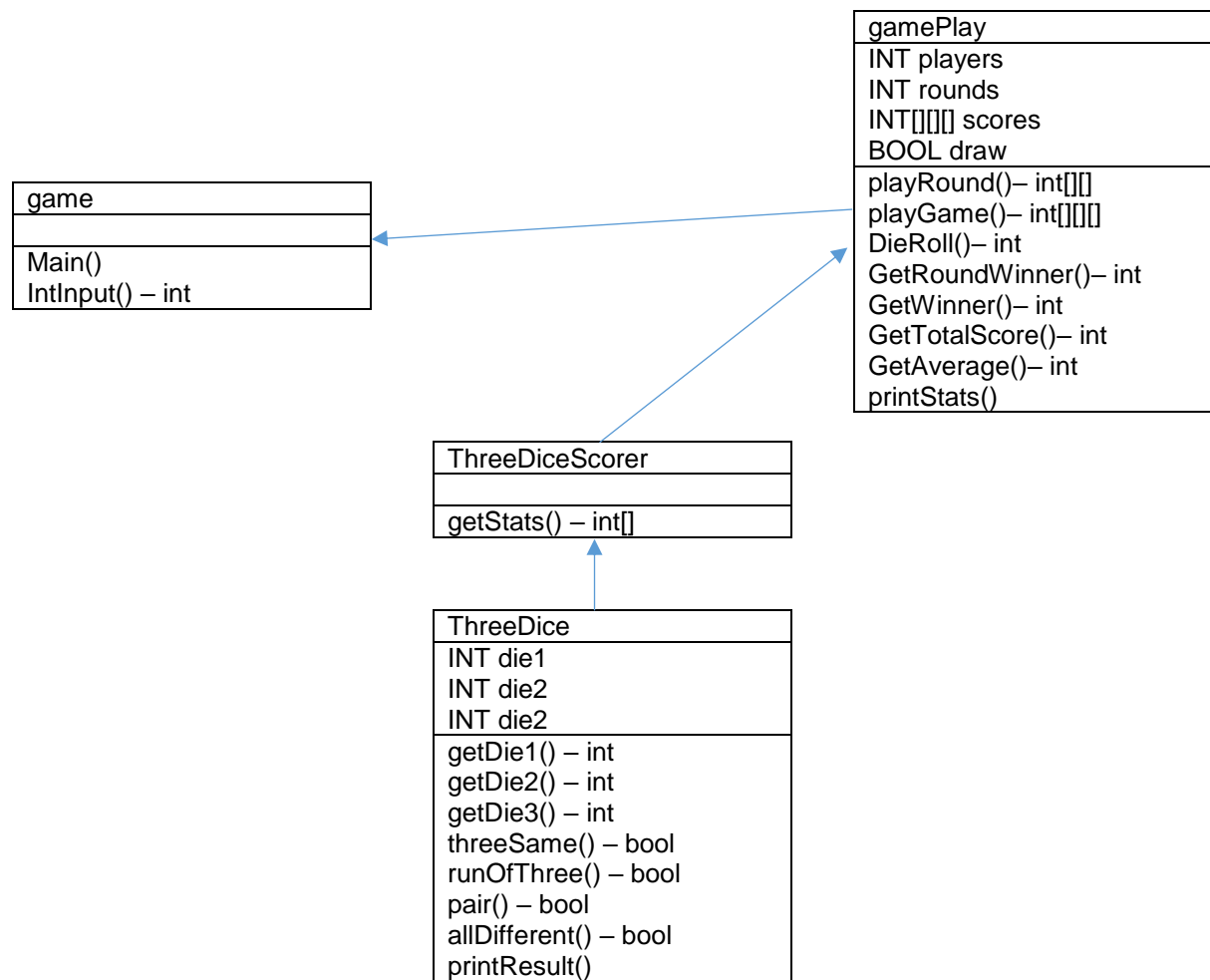
FOR EACH PLAYER

      IF PLAYER> TOPPLAYER

            TOPPLAYER = PLAYER

      END

END

RETURN TOPPLAYER

Class Diagram

```
                                                        ┌─────────────────────────────┐
                                                        │ gamePlay                    │
                                                        ├─────────────────────────────┤
                                                        │ INT players                 │
                                                        │ INT rounds                  │
                                                        │ INT[][][] scores            │
                                                        │ BOOL draw                   │
                                                        ├─────────────────────────────┤
                                                        │ playRound()– int[][]        │
        ┌────────────────────────────┐                  │ playGame()– int[][][]       │
        │ game                       │                  │ DieRoll()– int              │
        ├────────────────────────────┤◄─────────────────│ GetRoundWinner()– int       │
        │ Main()                     │                  │ GetWinner()– int            │
        │ IntInput() – int           │                  │ GetTotalScore()– int        │
        └────────────────────────────┘                  │ GetAverage()– int           │
                                                        │ printStats()                │
                                                        └─────────────────────────────┘
                                                                      ▲
                                    ┌────────────────────────────┐   ╱
                                    │ ThreeDiceScorer            │  ╱
                                    ├────────────────────────────┤ ╱
                                    │ getStats() – int[]         │╱
                                    └────────────────────────────┘
                                                  ▲
                                    ┌────────────────────────────┐
                                    │ ThreeDice                  │
                                    ├────────────────────────────┤
                                    │ INT die1                   │
                                    │ INT die2                   │
                                    │ INT die2                   │
                                    ├────────────────────────────┤
                                    │ getDie1() – int            │
                                    │ getDie2() – int            │
                                    │ getDie3() – int            │
                                    │ threeSame() – bool         │
                                    │ runOfThree() – bool        │
                                    │ pair() – bool              │
                                    │ allDifferent() – bool      │
                                    │ printResult()              │
                                    └────────────────────────────┘
```

Testing

Players	Rounds	As Expected
1	2	Yes
2	4	Yes
3	2	Yes
4	3	Yes
5	5	Yes
6	6	Yes
7	2	Yes

Evidence

C:\Users\BenHa\OneDrive\Documents\JAVA\Lab 10>java gameExt

Please enter the number of Players:1

Please enter the number of Rounds:2

Round 1   Player 1: 3, 5, 6   Score: 14   The Winner this round is Player 1

Round 2   Player 1: 3, 5, 6   Score: 14   The Winner this round is Player 1

Total Points

Player 1: 28

Average Points Per Round

Player: 1: 14

The Overall Points Winner is Player:1

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Please enter the number of Players:2

Please enter the number of Rounds:4

Round 1   Player 1: 4, 4, 5   Score: 33   Player 2: 2, 4, 6   Score: 12   The Winner this round is Player 1

Round 2   Player 1: 3, 3, 4   Score: 30   Player 2: 2, 5, 5   Score: 32   The Winner this round is Player 2

Round 3   Player 1: 4, 5, 6   Score: 55   Player 2: 1, 2, 2   Score: 25   The Winner this round is Player 1

Round 4   Player 1: 2, 3, 5   Score: 10   Player 2: 3, 4, 6   Score: 13   The Winner this round is Player 2

Total Points

Player 1: 128   Player 2: 82

Average Points Per Round

Player: 1: 32   Player: 2: 20

The Overall Points Winner is Player:1

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Please enter the number of Players:3

Please enter the number of Rounds:2

Round 1   Player 1: 1, 3, 3   Score: 27   Player 2: 3, 4, 4   Score: 31   Player 3: 1, 5, 6   Score: 12   The Winner this round is Player 2

Round 2   Player 1: 1, 4, 6   Score: 11   Player 2: 1, 2, 5   Score: 8   Player 3: 1, 3, 3   Score: 27   The Winner this round is Player 3

Total Points

Player 1: 38   Player 2: 39   Player 3: 39

Average Points Per Round

Player: 1: 19   Player: 2: 19   Player: 3: 19

The Overall Points Winner is Player:2

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Please enter the number of Players:4

Please enter the number of Rounds:3

Round 1   Player 1: 1, 3, 5   Score: 9   Player 2: 4, 4, 4   Score: 72   Player 3: 1, 3, 5
Score: 9   Player 4: 3, 3, 3   Score: 69   The Winner this round is Player 2

Round 2   Player 1: 3, 3, 5   Score: 31   Player 2: 2, 5, 5   Score: 32   Player 3: 1, 4, 6
Score: 11   Player 4: 3, 4, 6   Score: 13   The Winner this round is Player 2

Round 3   Player 1: 4, 4, 6   Score: 34   Player 2: 2, 2, 6   Score: 30   Player 3: 1, 3, 5
Score: 9   Player 4: 1, 2, 2   Score: 25   The Winner this round is Player 1

Total Points

Player 1: 74   Player 2: 134   Player 3: 29   Player 4: 107

Average Points Per Round

Player: 1: 24   Player: 2: 44   Player: 3: 9   Player: 4: 35

The Overall Points Winner is Player:2

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Please enter the number of Players:5

Please enter the number of Rounds:5

Round 1   Player 1: 1, 5, 5   Score: 31   Player 2: 1, 2, 6   Score: 9   Player 3: 1, 2, 4   Score: 7   Player 4: 1, 4, 6   Score: 11   Player 5: 2, 2, 5   Score: 29   The Winner this round is Player 1

Round 2   Player 1: 3, 3, 5   Score: 31   Player 2: 1, 5, 6   Score: 12   Player 3: 2, 6, 6   Score: 34   Player 4: 1, 3, 6   Score: 10   Player 5: 2, 4, 4   Score: 30   The Winner this round is Player 3

Round 3   Player 1: 1, 4, 6   Score: 11   Player 2: 5, 6, 6   Score: 37   Player 3: 2, 4, 5   Score: 11   Player 4: 1, 5, 5   Score: 31   Player 5: 2, 2, 6   Score: 30   The Winner this round is Player 2

Round 4   Player 1: 2, 2, 3   Score: 27   Player 2: 1, 2, 2   Score: 25   Player 3: 3, 3, 6   Score: 32   Player 4: 2, 4, 5   Score: 11   Player 5: 2, 3, 4   Score: 49   The Winner this round is Player 5

Round 5   Player 1: 3, 3, 5   Score: 31   Player 2: 1, 5, 5   Score: 31   Player 3: 2, 2, 2   Score: 66   Player 4: 1, 6, 6   Score: 33   Player 5: 5, 6, 6   Score: 37   The Winner this round is Player 3

Total Points

Player 1: 131   Player 2: 114   Player 3: 150   Player 4: 96   Player 5: 175

Average Points Per Round

Player: 1: 26   Player: 2: 22   Player: 3: 30   Player: 4: 19   Player: 5: 35

The Overall Points Winner is Player:5

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Please enter the number of Players:6

Please enter the number of Rounds:6

Round 1   Player 1: 2, 6, 6   Score: 34   Player 2: 4, 6, 6   Score: 36   Player 3: 1, 4, 6   Score: 11   Player 4: 2, 5, 6   Score: 13   Player 5: 1, 3, 5   Score: 9   Player 6: 2, 4, 5   Score: 11   The Winner this round is Player 2

Round 2   Player 1: 2, 3, 4   Score: 49   Player 2: 1, 3, 4   Score: 8   Player 3: 2, 4, 4   Score: 30   Player 4: 1, 4, 4   Score: 29   Player 5: 3, 4, 5   Score: 52   Player 6: 3, 6, 6   Score: 35   The Winner this round is Player 5

Round 3   Player 1: 1, 3, 6   Score: 10   Player 2: 2, 4, 6   Score: 12   Player 3: 2, 4, 5   Score: 11   Player 4: 4, 5, 6   Score: 55   Player 5: 1, 3, 5   Score: 9   Player 6: 2, 2, 5   Score: 29   The Winner this round is Player 4

Round 4   Player 1: 3, 3, 5   Score: 31   Player 2: 3, 4, 6   Score: 13   Player 3: 4, 6, 6   Score: 36   Player 4: 1, 5, 6   Score: 12   Player 5: 2, 3, 6   Score: 11   Player 6: 1, 5, 6   Score: 12   The Winner this round is Player 3

Round 5   Player 1: 2, 4, 6   Score: 12   Player 2: 1, 4, 5   Score: 10   Player 3: 2, 2, 4
Score: 28   Player 4: 1, 2, 5   Score: 8   Player 5: 3, 3, 6   Score: 32   Player 6: 1, 4, 4
Score: 29   The Winner this round is Player 5

Round 6   Player 1: 2, 5, 5   Score: 32   Player 2: 1, 3, 4   Score: 8   Player 3: 3, 4, 6
Score: 13   Player 4: 1, 6, 6   Score: 33   Player 5: 1, 2, 3   Score: 46   Player 6: 1, 4, 5
Score: 10   The Winner this round is Player 5

Total Points

Player 1: 168   Player 2: 87   Player 3: 129   Player 4: 150   Player 5: 159   Player 6: 126

Average Points Per Round

Player: 1: 28   Player: 2: 14   Player: 3: 21   Player: 4: 25   Player: 5: 26   Player: 6: 21

The Overall Points Winner is Player:1

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Please enter the number of Players:7

Please enter the number of Rounds:2

Round 1   Player 1: 2, 6, 6   Score: 34   Player 2: 4, 4, 6   Score: 34   Player 3: 1, 4, 6
Score: 11   Player 4: 1, 1, 3   Score: 25   Player 5: 2, 2, 6   Score: 30   Player 6: 1, 4, 6
Score: 11   Player 7: 3, 3, 5   Score: 31   The Winner this round is Player 1

Round 2   Player 1: 1, 3, 5   Score: 9   Player 2: 2, 4, 4   Score: 30   Player 3: 3, 4, 6
Score: 13   Player 4: 2, 5, 6   Score: 13   Player 5: 2, 2, 3   Score: 27   Player 6: 2, 5, 6
Score: 13   Player 7: 1, 2, 5   Score: 8   The Winner this round is Player 2

Total Points

Player 1: 43   Player 2: 64   Player 3: 24   Player 4: 38   Player 5: 57   Player 6: 24   Player 7: 39

Average Points Per Round

Player: 1: 21   Player: 2: 32   Player: 3: 12   Player: 4: 19   Player: 5: 28   Player: 6: 12   Player: 7: 19