Pseudocode darts 501

Source.cpp

```
Seed random
Ask user to enter name for player 1/2;
Save name for player ½ in variable;
Ask user to enter accuracy for player 1/2;
Save accuracy for player ½ in variable;
Display main menu graphic;
While user has not pressed ‘q’  to quit;
    Switch user input;
        Case: ‘1’
            If (in Main Menu and not in Play menu)
                Clear console
                Display main menu
            End if
            Else if (in Play menu)
                Clear console
                Display darts301menu
            End elif
            Else if (in darts301 menu)
                Play darts 301
            End elif
            Else if (in darts501 menu)
                Play darts 501
            Else if (inSettings menu)
                If (playerEdit = 1
                    Ask user to enter new inner bull chance for player 1
                End if
                If (playerEdit = 2)
                    Ask user to enter new inner bull chance for player 2
                End if
            End elif
            Else if (inAdvanced settings menu)
                If (playerEdit = 1
                    Ask user to enter new outer bull chance for player 1
                End if
                If (playerEdit = 2)
                    Ask user to enter new outer bull chance for player 2
                End if
            End elif
```

```
Case ‘2’
    If (in main menu)
        Clear console
        Display settings menu
    End if
    Else if (in play menu)
        Clear console
        Display darts501 menu
    End elif
    Else if (indarts301 menu)
        Set darts301InfoThrows variable to opposite
        Display updated darts301 menu
    end elif
    Else if (inDarts501 menu)
        Ask user to chose which player they want to control
        Play interactive darts501
    End elif
    Else if (In advanced settings menu)
        If (playerEdit = 1
            Ask user to enter new single chance for player 1
        End if
        If (playerEdit = 2)
            Ask user to enter new single chance for player 2
        End if
    End elif
Case ‘3’
    If (in darts 301 menu)
        Set darts301percentages to opposite
        clear console
        Display updated darts301 menu
    End if
    Else if (in darts 501 menu)
        Set darts501InfoThrows to opposite
        clear console
        Display updated darts501 menu
    End if
    Else if (in advanced settings menu)
        If (playerEdit = 1
            Ask user to enter new double chance for player 1
        End if
        If (playerEdit = 2)
            Ask user to enter new double chance for player 2
        End if
    End elif
Case ‘4’
    If (in darts 501 menu)
        setDarts501InfoPercentages to opposite
        clear console
        display updated darts 501 menu
    end if
    Else if (in advanced settings menu)
        If (playerEdit = 1
            Ask user to enter new treble chance for player 1
        End if
        If (playerEdit = 2)
            Ask user to enter new treble chance for player 2
        End if
    End elif
Case ‘a’
    If (in settings)
        Clear console
        Display advanced settings menu
    End if
Case ‘b’
    In (in play menu)
        Clear console
        Display main menu
    Endif
    Else if (in settings)
        Clear console
        Display main menu
    End elif
    Else if (in advanced settings menu)
        Clear console
        Display settings menu
    End elif
    Else if (in Darts 301 menu)
        Clear console
        Display play menu
    End elif
```

```
            Else if (in darts 501 menu)
                Clear console
                Display play menu
            End elif
        Case ‘r’
            If (in settings)
                If (playerEdit = 1
                    Reset inner bull chance for player 1
                End if
                If (playerEdit = 2)
                    Reset inner bull chance for player 2
                End if
                Clear console
                Display settings with updated values

            End if
            Else if (in advanced settings menu)
                If (playerEdit = 1
                    Reset advanced settings for player 1
                End if
                If (playerEdit = 2)
                    Reset advanced settings for player 2
                End if
                Clear console
                Display advanced settings with updated values
            End elif
        Case ‘p’
            If (inSettings)
                Set PlayerEdit to opposite
                Clear console
                Display updated settings menu
            End if
            Else if (in advance settings)
                Set playerEdit to opposite
                Clear console
                Display updated settings menu
            End elif
        Case ‘q’
            Display “Ty for playing”
End while
```

Players.cpp

```
Void function to throwDart (int target, int gamemode, char throwType)
    Set the tempScore to score
    Check different target inputs
    If (target = 50 and throw type is ‘b’)
        Call function to throw inner bull and pass gamemode as variable
    Else if (target = 25 and the gamemode is 301 and the throw type is b)
        Call function to throw outer bull and pass gamemode as variable
    Else if (target <= 20)
        Switch throwType
            Case ‘s’
                Call function to throw single and pass gamemode and target as variable
            Case ‘d’
                Call function to throw double and pass gamemode and target as variable
            Case ‘t’
                Call function to throw treble and pass gamemode and target as variable
            Default:
                Display error message
    Else
        Display error message
End function
Void function to throw for inner bull (int gamemode)
    Generate a random number between 1 and 100 and put it into a variable called random
    Generate a random number between 1 and 2 and put it into a variable called random side
    Display messages
    If (random <= chance of hitting inner bull)
        Display hit message
        If (call function to check if throw is valid and pass 50, gamemode and ‘b as argument)
            Hit innerbull
            Reduce score
            Display score
        Else
            Display message “Invalid score”
        Increment innerbullseyesIN
    Else if (random side = 1 and gamemode != 301)
        Display hit message
        If (valid score)
            Hit outerbull
```

```
                Reduce score
                Display score
            Else
                Display message “Invalid score”
            Increment outerbullseyesIN
        Else if (random side = 2 or gamemode = 301
            Generate a random target from 1 to 20
            Display hit message
            If (valid score)
                Hit random target
                Reduce score
                Display score
            Else
                Display message “Invalid score”
            Increment missed bullseyesIN
        Increment inner bullseye throws
End function

Void function to throw for outer  bull (int gamemode)
    If (gamemode != 301)
        Generate a random number between 1 and 100 and put it into a variable called random
        Generate a random number between 1 and 2 and put it into a variable called random side
        Display messages
        If (random <= chance of hitting inner bull)
            Display hit message
            If (call function to check if throw is valid and pass 50, gamemode and ‘b as argument)
                Hit outer bull
                Reduce score
                Display score
            Else
                Display message “Invalid score”
            Increment outerbullseyesOUT
        Else if (random side = 1 and gamemode != 301)
            Display hit message
            If (valid score)
                Hit inner bull
                Reduce score
                Display score
            Else
                Display message “Invalid score”
            Increment innerbullseyesOUT
        Else if (random side = 2 or gamemode = 301
            Generate a random target from 1 to 20
            Display hit message
            If (valid score)
                Hit random target
                Reduce score
                Display score
            Else
                Display message “Invalid score”
            Increment missedbullseyesOUT
        Increment outer bullseye throws
    Else
        Display message that you can throw for outerbull only in 501
End function

Void function for throwing single (int target, int gamemode)
    Generate a random number between 1 and 100 and store it in a variable called randomStraight
    Generate a random number between 1 and 8 and store it in a variable called randomSIde
    If (gamemode = 301)
        Change the variable stored in random side to random variable between 1 and 2
    Display messages
    If (randomStraight <= chance of hitting single throws)
        Display hit message
        If (target is valid score)
            Reduce score
            Display score
        Else
            Display “Invalid score”
        Increment hitTargetSIN
    Else
        Switch (randomSide)
            Case 1
                Display hit message
                If (left neighbour of target is valid score)
                    Reduce score by the value of left neighbour
                Else
                    Display invalid score
                Increment wentLeftTargetSIN
            Case 2
                Display hit message
                If (right neighbour of target is valid score)
                Reduce score by the value of right neighbour
        Else
                Display invalid score
        Increment wentRightTargetSIN
Case 3
        Display hit message
        If (left neighbour of target * 2 is valid score)
                Reduce score by the value of left neighbour * 2
        Else
                Display invalid score
        Increment wentLeftDoubleSIN

Case 4
        Display hit message
        If (target * 2 is valid score)
                Reduce score by the value of target * 2
        Else
                Display invalid score
        Increment wentStraightDoubleSIN
Case 5
        Display hit message
        If (right neighbour of target * 2 is valid score)
                Reduce score by the value of right neighbour * 2
        Else
                Display invalid score
        Increment wentRightDoubleSIN
Case 6
        Display hit message
        If (left neighbour of target * 3 is valid score)
                Reduce score by the value of left neighbour * 3
        Else
                Display invalid score
        Increment wentLeftTrebleSIN

Case 7
        Display hit message
        If (target * 3 is valid score)
                Reduce score by the value of target * 3
        Else
                Display invalid score
        Increment wentStraightTrebleSIN
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            Case 8
                Display hit message
                If (right neighbour of target * 3 is valid score)
                    Reduce score by the value of right neighbour * 3
                Else
                    Display invalid score
                Increment wentRightTrebleSIN
            Default
                Display error message
        Increment throwsSIN
End function
Void function for throwing double (int target,int gamemode)
    Generate a random number between 1 and 100 and store it in a variable called randomStraight
    Generate a random number between 1 and 8 and store it in a variable called randomSIde
    Display messages
    If (randomStraight <= chance of hitting double throws)
        Display hit message
        If (2 * target is valid score)
            Reduce score by target * 2
            Display score
        Else
            Display “Invalid score”
        Increment hitTargetDOU
    Else
        Switch (randomSide)
            Case 1
                Display hit message
                If (left neighbour of target * 2 is valid score)
                    Reduce score by the value of left neighbour * 2
                Else
                    Display invalid score
                Increment wentLeftTargetSIN
            Case 2
                Display hit message
                If (right neighbour of target * 2  is valid score)
                    Reduce score by the value of right neighbour * 2
                Else
                    Display invalid score
                Increment wentRightTargetSIN
            Case 3
            Case 4
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                Case 5
                        Display missed dartboard message
                        Increment missed
                Case 6
                        Display hit message
                        If (left neighbour of target is valid score)
                                Reduce score by the value of left neighbour
                        Else
                                Display invalid score
                        Increment wentLeftSingleDOU

                Case 7
                        Display hit message
                        If (target is valid score)
                                Reduce score by the value of target
                        Else
                                Display invalid score
                        Increment wentStraightSingleDOU
                Case 8
                        Display hit message
                        If (right neighbour of target is valid score)
                                Reduce score by the value of right neighbour
                        Else
                                Display invalid score
                        Increment wentRightSingleDOU
                Default
                        Display error message
        Increment throwsDOU
End function
Void function for throwing treble (int target,int gamemode)
        Generate a random number between 1 and 100 and store it in a variable called randomStraight
        Generate a random number between 1 and 8 and store it in a variable called randomSIde
        Display messages
        If (randomStraight <= chance of hitting treble throws)
                Display hit message
                If (3 * target is valid score)
                        Reduce score by target * 3
                        Display score
                Else
                        Display "Invalid score"
                Increment hitTargetTRE
```

```
Else
    Switch (randomSide)
        Case 1
            Display hit message
            If (left neighbour of target * 3 is valid score)
                Reduce score by the value of left neighbour * 3
            Else
                Display invalid score
            Increment wentLeftTargetTRE
        Case 2
            Display hit message
            If (right neighbour of target * 3  is valid score)
                Reduce score by the value of right neighbour * 3
            Else
                Display invalid score
            Increment wentRightTargetTRE
        Case 3
        Case 4
            Display hit message
            If (left neighbour of target is valid score)
                Reduce score by the value of left neighbour
            Else
                Display invalid score
            Increment wentLeftSingleTRE

        Case 5
        Case 6
            Display hit message
            If (target is valid score)
                Reduce score by the value of target
            Else
                Display invalid score
            Increment wentStraightSingleTRE

        Case 7
        Case 8
            Display hit message
            If (right neighbour of target is valid score)
                Reduce score by the value of right neighbour
            Else
                Display invalid score
```

```
                    Increment wentRightSingleTRE
                Default
                    Display error message
            Increment throwsTRE
End function


Void function strategy
        Declare a variable called difference = score – 50
        If (score >= 140)
            Throw for treble 20
        Else if (enemy is not ahead, and score is between 107 and 61 and it is possible to make a treble or a double throw which will allow the player to get to bull
            If (difference can be divided by 3)
                Target = difference / 3
                Throw dart at target treble
            Else if (difference can be divided by  2)
                Target = difference / 2
                Throw dart at target double
        Else if (score = 99 or score <= 139 and >= 101)
            Loop the second row of an array full of darts checkouts until you find the column in which the value is equal to the score
            Get the value from the arrays first row where the best target is saved
            Throw dart at treble target
        Else if (score == 100 or score <= 98 and >=61
            Loop the second row of an array full of darts checkouts until you find the column in which the value is equal to the score
            Get the value from the arrays first row where the best target is saved
            Throw dart at treble target

        Else if score <= 60 and >= 51
            IF ahead
                Play safe and try to get score to 40
                Throw dart aiming at score – 40 using single throw
            Else
                Play aggressive and try to get score to 50
                Throw dart aiming at score – 50 using single throw
        Else if score = 50
            Throw for bull
        Else if score >= 41 and <= 49
            Throw dart aiming at score – 40 using single throw to get to 40
        Else if score is even and <= 40
            Loop the second row of an array full of darts checkouts until you find the column in which the value is equal to the score
            Get the value from the arrays first row where the best target is saved
            Throw dart at double target
        Else
            Throw dart aiming at single 1 to make score even
End function
Void function for calculating averages
        If (gamemode = 301)
            If (infoPercentages)
                Calculate average hit chances for throws during a 301 game by dividing the amount of different hits by the amount of
                throws and multiplying by 100
            Display message about the wins the player has
        Else if (gamemode = 501)
            If (infoPercentages)
                Calculate average hit chances for throws during a 301 game by dividing the amount of different hits by the amount of
                throws and multiplying by 100
        Call function to reset stats
End function


Bool function for checking winner
        Return true if score = 0
End function


Bool function for checking if score is valid (int target, int gamemode, chat throwType)
        Total = score – target
        if gamemode = 301
            if total >= 50 or total = 0
                return true
            else
                display fail message
                return false
        else if gamemode = 501
            if total > 1
                return true
            else if target == 50 and total = 0
                return true
            else if throwType == ‘d’ and total = 0
                return true
            else if total <= 1
                Display bust message
                Set score to temp score
                Return false
        Else
```

```
                Display error message
                Return false
End function

Void function for resetting stats
        Set all stats variables to 0
End function

Void function for incrementing sets won
        Increment sets won
End function
Void function for incrementing rounds won
        Increment rounds won
End function

Void function for incrementing championships won
        Increment championships won
End function
```

Dartboard.cpp

```
int function for getting left neighbour (int target)
        return dartboardscores array where row = 0 aka left and column = target
end function

int function for getting right neighbour (int target)
        return dartboardscores array where row = 1 aka right and column = target
end function
```

Gamemodes.cpp

```
Void function for simulating a game for darts 301
        Set score of both players to 301
        Display message that it is running
        Display message asking which player should go first
        Input into choice
        If (choice = 1)
                Set playing player to p1
                Display message saying p1 will go first
        Else if (choice = 2)
                Set playing player to p2
                Display message saying p2 will go first
        Else
```

```
            Display error message

        Display message asking how many game user wants to simulate

        Input into number of games

        For (runs for the same amount as number of games the user wants)

            Display message about how many games have been ran

            While (p1 is not a winner and p2 is not a winner)

                Int scoreNow = call function for getting score of player

                int difference = scoreNow – 50

                if (scoreNow > 70 or = 50)

                    throw for bull 50

                else if (score now <= 70 and > 50)

                    throw for difference in order to get score to

                IF (playing player = p1)
                    playing player = p2

                Else

                    Playing player = 1

            End while

            If (p1 is a winner)

                Call function for incrementing rounds player 1

            Else {

                Call function for incrementing rounds of player 2

            Set score of both player to 301

        Display "Results"

        Float winPercent1 = (win count of player 1 / number of games) * 100

        Display message saying win percent of player 1

        Float winPercent2= (win count of player 2 / number of games) * 100

        Display message saying win percent of player 2

End function

Void function for simulating a game of darts 501

        Set scores of both players to 501

        Display message that is running

        Generate a random number between 1 and 2

        If (random number = 1)

            Playing player = p1

        Else {

            Playing player = p2


        Display message asking how many game user wants to simulate

        Input into number of games

        For (runs for the same amount as number of games the user wants)

            Display message about how many games have been ran
        While (p1 has won 7 sets and p2 has not won 7 sets)
            While (p1 has not won 3 rounds and p2 has not won 3 rounds)
                While (p1 has not won a game and p2 has not won a game)
                    Run a for loop 3 times
                        If p1(score > p2 score)
                            Call setter which sets is ahead of p2 to true
                        Else
                            Call setter which sets is ahead of p1 to true
                        Call function for playing strategy for the playing player
                        If playing player has won
                            Stop for loop
                    End for
                    If (playing player = p1)
                        Playing player = p2
                    Else
                        Playing player = p1
                    End elif
                End while
                If (p1 has won)
                    Increment player 1 wins
                Else
                    Increment player 2 wins
                Sets scores of both player to 501
            End while
            If (p1 has won 3 rounds)
                Increment p1 set wins
            Else
                Increment p2 set wins
            Set win count of both players to 0
        End while
        If (p1 has won 7 sets)
            Increment the setsWonArray on row 0 for player in the column where the enemy is finished
        Else
            Increment the setsWonArray on row 2 for player in the column where the enemy is finished
        Set win count of both players to 0
    End for
    Display results
End function
```

```
Void function for running an interactive game of darts 501
    Set scores of both players to 501
    Display message that is running
    Generate a random number between 1 and 2
    If (random number = 1)
        Playing player = p1
        display message that player  will go first
    Else {
        Playing player = ai
        display message that ai will go first
    Pause console so user can read
    Clear console
    While (p1 has won 7 sets and ai has not won 7 sets)
        While (p1 has not won 3 rounds and ai has not won 3 rounds)
            While (p1 has not won a game and ai has not won a game)
                If (playing player = p1)
                    Run a for loop 3 times
                        Display stats
                        Ask what throw they want to make
                        Input into throwType
                        If (throwType = ‘s’ or ‘d’ or ‘t’)
                            Ask what target they want to aim for
                            Throw dart at target
                            Pause console so user can read
                            Clear console
                        Else if (throwType = ‘b’)
                            Ask what bull user wants to aim for
                            Input into target
                            Throw dart at target
                            Pause console so user can read
                            Clear console
                        Else
                            Display error message
                            Pause console so user can read
                            Clear console
                    End for
                    If (playing player) has not won
                        Switch playing player to ai
                Else
                    For loop 3 times
                    If p1(score > ai score)
```

```
                        Call setter which sets is ahead of ai to true
                    Else
                        Call setter which sets is ahead of p1 to true
                    Call function for playing strategy for the ai player
                    If ai has won
                        Stop for loop
                    End for
                Pause console so user can read
                Clear console
                If (player has won)
                    Player increment win
                Else
                    Ai increment wins
                End elif
            End while
            If (p1 has won 3 rounds)
                Increment p1 set wins
            Else
                Increment ai set wins
            Set win count of both players to 0
        End while
    If (p1 has won 7 sets)
        Increment the setsWonArray on row 0 for player in the column where the enemy is finished
    Else
        Increment the setsWonArray on row 2 for player in the column where the enemy is finished
        Set win count of both players to 0
    Display results
End function
```