

### Adding a "Closeness" feature, telling the user if they missed – how close they were to the ship.

```
Function closeness(ByVal board(,) As Char, ByVal row As Integer, ByVal column As Integer, ByRef close As Boolean)
    If board(row + 1, column) = "A" Or board(row + 1, column) = "B" Or board(row + 1, column) = "S" Or board(row + 1, column)
= "D" Or board(row + 1, column) = "P" Then
        Return True
    ElseIf board(row - 1, column) = "A" Or board(row - 1, column) = "B" Or board(row - 1, column) = "S" Or board(row - 1,
column) = "D" Or board(row - 1, column) = "P" Then
        Return True
    ElseIf board(row, column + 1) = "A" Or board(row, column + 1) = "B" Or board(row, column + 1) = "S" Or board(row, column +
1) = "D" Or board(row, column + 1) = "P" Then
        Return True
    ElseIf board(row, column - 1) = "A" Or board(row, column - 1) = "B" Or board(row, column - 1) = "S" Or board(row, column -
1) = "D" Or board(row, column - 1) = "P" Then
        Return True
    ElseIf board(row + 1, column + 1) = "A" Or board(row + 1, column + 1) = "B" Or board(row + 1, column + 1) = "S" Or
board(row + 1, column + 1) = "D" Or board(row + 1, column + 1) = "P" Then
        Return True
    ElseIf board(row + 1, column - 1) = "A" Or board(row + 1, column - 1) = "B" Or board(row + 1, column - 1) = "S" Or
board(row + 1, column - 1) = "D" Or board(row + 1, column - 1) = "P" Then
        Return True
    ElseIf board(row - 1, column + 1) = "A" Or board(row - 1, column + 1) = "B" Or board(row - 1, column + 1) = "S" Or
board(row - 1, column + 1) = "D" Or board(row - 1, column + 1) = "P" Then
        Return True
    ElseIf board(row - 1, column - 1) = "A" Or board(row - 1, column - 1) = "B" Or board(row - 1, column - 1) = "S" Or
board(row - 1, column - 1) = "D" Or board(row - 1, column - 1) = "P" Then
        Return True
    Else
        Return False
    End If
End Function
```

```
Sub MakePlayerMove(ByRef Board(,) As Char, ByRef Ships() As TShip)
    Dim Row As Integer
    Dim Column As Integer
    Dim close As Boolean = False

    GetRowColumn(Row, Column)
    If Board(Row, Column) = "m" Or Board(Row, Column) = "h" Then
        Console.WriteLine("Sorry, you have already shot at the square (" & Column & "," & Row & "). Please try again.")
    ElseIf Board(Row, Column) = "-" Then
        Console.WriteLine("Sorry, (" & Column & "," & Row & ") is a miss.")
        close = closeness(Board, Row, Column, close)

        If close Then
            Console.WriteLine("You were very close!")
        ElseIf close = False Then
```

```

        Console.WriteLine("You were not very close!")
    End If

    Board(Row, Column) = "m"
Else
    Console.WriteLine("Hit at (" & Column & "," & Row & ").")
    Board(Row, Column) = "h"
End If
End Sub

```

The Real board looks like this:

```

 0 1 2 3 4 5 6 7 8 9
0 - - - - - - - S - -
1 - - - - - - - S - -
2 - - - B - - - - - S
3 - - - - B - - - - -
4 - - - - - B - - - -
5 - - - - - - B - - -
6 - - - - - - - - - -
7 D D D - - A A A A A
8 - - - - - - P P - -
9 - - - - - - - - - -

```

Press <ENTER> to return back to the main menu!

You were very close!

The board looks like this:

```

 0 1 2 3 4 5 6 7 8 9
0 | | | | | | | | |
1 | | | | | | | | |
2 | | | | | | | | |
3 | | | | | | | | |
4 | | | | | | | | |
5 | | | | | | | | |
6 | | | | | | | | |
7 | | | | | | | | |
8 | | | | | m | | |
9 | | | | | | | | |

```

Please enter column:

### Fixing 0 to 9 Issue

```

Sub GetRowColumn(ByRef Row As String, ByRef Column As String)
    Dim chk As Boolean = False
    Do
        Try
            Console.WriteLine()
            Console.Write("Please enter column: ")
            Column = Console.ReadLine()
            Console.Write("Please enter row: ")
            Row = Console.ReadLine()
            Console.WriteLine()
            Convert.ToInt32(Column)
            Convert.ToInt32(Row)
            If (Row > 9 Or Row < 0) Or (Column > 9 Or Column < 0) Then
                Console.WriteLine("Please enter something between 0 and 9")
                chk = False
            Else
                chk = True
            End If
        Catch ex As Exception
    End Do

```

```

        Console.WriteLine("Please enter a integer value!")
    End Try
    Loop Until chk And IsNumeric(Row) = True And IsNumeric(Column) = True
End Sub

```

The board looks like this:

```

 0  1  2  3  4  5  6  7  8
0  |  |  |  |  |  |  |  |  |
1  |  |  |  |  |  |  |  |  |
2  |  |  |  |  |  |  |  |  |
3  |  |  |  |  |  |  |  |  |
4  |  |  |  |  |  |  |  |  |
5  |  |  |  |  |  |  |  |  |
6  |  |  |  |  |  |  |  |  |
7  |  |  |  |  |  |  |  |  |
8  |  |  |  |  |  |  |  |  |

```

```

Please enter column: 123
Please enter row: somali

Please enter a integer value!
Please enter column:

```

### Adding a dynamic board (allow changing dimensions, dynamically)

```

Sub Main()
    Dim row, column As Integer
    Console.WriteLine("How big Row?")
    row = Console.ReadLine
    Console.WriteLine("How big Column?")
    column = Console.ReadLine
    Console.Clear()
    Dim Board(row, column) As Char
    Dim Ships(4) As TShip
    Dim MenuOption As Integer
    Do
        SetUpBoard(Board, row, column)
        SetUpShips(Ships)
        DisplayMenu()
        MenuOption = GetMainMenuChoice()
        If MenuOption = 1 Then
            PlaceRandomShips(Board, Ships, row, column)
            PlayGame(Board, Ships, row, column)
        ElseIf MenuOption = 2 Then
            LoadGame(TrainingGame, Board)
            PlayGame(Board, Ships, row, column)
        End If
    Loop
End Sub

```

```

        ElseIf MenuOption = 4 Then
            PlaceRandomShips(Board, Ships, row, column) //This is for RealBoard!!
            realboard(Board, row, column)
        End If
    Loop Until MenuOption = 9
End Sub

Sub PlayGame(ByVal Board(,) As Char, ByVal Ships() As TShip, ByVal row1 As Integer, ByRef col1 As Integer)
    Dim GameWon As Boolean = False
    Do
        PrintBoard(Board, row1, col1)
        MakePlayerMove(Board, Ships)
        GameWon = CheckWin(Board, row1, col1)
        If GameWon Then
            Console.WriteLine("All ships sunk!")
            Console.WriteLine()
        End If
    Loop Until GameWon
End Sub

Sub PrintBoard(ByVal Board(,) As Char, ByVal row1 As Integer, ByVal col1 As Integer)
    Dim Row As Integer
    Dim Column As Integer
    Console.WriteLine()
    Console.WriteLine("The board looks like this: ")
    Console.WriteLine()
    Console.Write(" ")
    For Column = 0 To col1
        If Column < 10 Then
            Console.Write(" " & Column & " ")
        Else
            Console.Write(" " & Column & " ")
        End If
    Next
    Console.WriteLine()
    For Row = 0 To row1
        If Row < 10 Then
            Console.Write(Row & " ")
        Else
            Console.Write(Row & " ")
        End If

        For Column = 0 To col1
            If Board(Row, Column) = "-" Then
                Console.Write(" ")
            ElseIf Board(Row, Column) = "A" Or Board(Row, Column) = "B" Or Board(Row, Column) = "S" Or Board(Row, Column)
= "D" Or Board(Row, Column) = "P" Then
                Console.Write(" ")
            End If
        Next
    Next
End Sub

```

```

        Else
            Console.Write(Board(Row, Column))
        End If
        If Column <> coll Then
            Console.Write(" | ")
        End If
    Next
    Console.WriteLine()
Next
End Sub

```

```

Function CheckWin(ByVal Board(,) As Char, ByRef row1 As Integer, ByVal coll As Integer)
    Dim Row As Integer
    Dim Column As Integer
    For Row = 0 To row1
        For Column = 0 To coll
            If Board(Row, Column) = "A" Or Board(Row, Column) = "B" Or Board(Row, Column) = "S" Or Board(Row, Column) =
"D" Or Board(Row, Column) = "P" Then
                Return False
            End If
        Next
    Next
    Return True
End Function

```

```

Sub PlaceRandomShips(ByRef Board(,) As Char, ByVal Ships() As TShip, ByVal row1 As Integer, ByVal coll As Integer)
    Dim Valid As Boolean
    Dim Row As Integer
    Dim Column As Integer
    Dim Orientation As Char
    Dim HorV As Integer
    For Each Ship In Ships
        Valid = False
        While Not Valid
            Row = Int(Rnd() * (row1 + 1))
            Column = Int(Rnd() * (coll + 1))
            HorV = Int(Rnd() * 2)
            If HorV = 0 Then
                Orientation = "v"
            Else
                Orientation = "h"
            End If
            Valid = ValidateBoatPosition(Board, Ship, Row, Column, Orientation)
        End While
        Console.WriteLine("Computer placing the " & Ship.Name)
        PlaceShip(Board, Ship, Row, Column, Orientation)
    Next
End Sub

```

```

Sub SetUpBoard(ByRef Board(,) As Char, ByRef row1 As Integer, ByRef col1 As Integer)
    Dim Row As Integer
    Dim Column As Integer
    For Row = 0 To row1
        For Column = 0 To col1
            Board(Row, Column) = "-"
        Next
    Next
End Sub

```

```

Please enter column: 2
Please enter row: 6

Sorry, <2,6> is a miss.

The board looks like this:

  0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17  18
0 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
1 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
2 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
3 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
4 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
5 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
6 |   |   | m |   |   |   |   |   |   |   |   |   |   |   |   |   |
7 |   |   | m |   |   |   |   |   |   |   |   |   |   |   |   |   |
8 |   |   | m |   |   |   |   |   |   |   |   |   |   |   |   |   |
9 |   |   | h |   |   |   |   |   |   |   |   |   |   |   |   |   |
10 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
11 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
12 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

Please enter column:

```

```

How big Row?
12
How big Column?
18

```