```vba
' ESCAPE FROM A MAZE ..."TEN MINUTE" LOGIC (VBA module for MS Excel)


' *************************************************************************


' Create two worksheets in MS Excel document: "Task" and "Solving".
' Create "Start" button on the "Task" worksheet using:
' "MS Excel > Developer (ribbon tab) > Controls > Insert > Button".
' Create a new VBA module using:
' "MS Excel > Developer (ribbon tab) > Visual Basic > Insert > Module".
' Put the following code in this VBA module.
' Asign "main()" procedure to a "Start" button on "Task" worksheet using:
' context command "Assign Macro".
' In a region B2:U21 of "Task" worksheet you can draw maze using:
' "MS Excel > Home > Borders > ...".
' Set initial position in your maze using:
' "MS Excel > Home > Fill Color > Yellow".
' Press "Start" button to see results on "Solving" worksheet.


' Aleksandr Stremnev, 2021


' *************************************************************************


Option Explicit

Type BordersT
top_b As Boolean
right_b As Boolean
bottom_b As Boolean
left_b As Boolean
End Type

Type pPoint
x_p As Integer
y_p As Integer
End Type

Dim CAR(19, 19) As BordersT
Dim PATH(399) As pPoint
Dim pathlong As Integer

Sub main()
    Application.ScreenUpdating = False
    allbclear
    clpath
    map_read_write
    path_f
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```vba
End Sub

Sub map_read_write()

Dim x As Integer
Dim y As Integer

Dim i As Integer
Dim k As Integer

Sheets("Task").Activate
For k = 0 To 19 Step 1
    For i = 0 To 19 Step 1

        ActiveSheet.Cells(k + 2, i + 2).Select

        If Selection.Borders(xlEdgeTop).LineStyle = xlContinuous Then
            CAR(k, i).top_b = True
        Else
            CAR(k, i).top_b = False
        End If

        If Selection.Borders(xlEdgeRight).LineStyle = xlContinuous Then
            CAR(k, i).right_b = True
        Else
            CAR(k, i).right_b = False
        End If

        If Selection.Borders(xlEdgeBottom).LineStyle = xlContinuous Then
            CAR(k, i).bottom_b = True
        Else
            CAR(k, i).bottom_b = False
        End If

        If Selection.Borders(xlEdgeLeft).LineStyle = xlContinuous Then
            CAR(k, i).left_b = True
        Else
            CAR(k, i).left_b = False
        End If

    Next i
Next k

Sheets("Solving").Activate
For k = 0 To 19 Step 1
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    For i = 0 To 19 Step 1
        ActiveSheet.Cells(k + 2, i + 2).Select

        If CAR(k, i).top_b = True Then
            Selection.Borders(xlEdgeTop).LineStyle = xlContinuous
        Else
            Selection.Borders(xlEdgeTop).LineStyle = xlNone
        End If

        If CAR(k, i).right_b = True Then
            Selection.Borders(xlEdgeRight).LineStyle = xlContinuous
        Else
            Selection.Borders(xlEdgeRight).LineStyle = xlNone
        End If

        If CAR(k, i).bottom_b = True Then
            Selection.Borders(xlEdgeBottom).LineStyle = xlContinuous
        Else
            Selection.Borders(xlEdgeBottom).LineStyle = xlNone
        End If

        If CAR(k, i).left_b = True Then
            Selection.Borders(xlEdgeLeft).LineStyle = xlContinuous
        Else
            Selection.Borders(xlEdgeLeft).LineStyle = xlNone
        End If

    Next i
Next k

End Sub


Sub path_f()

Dim xp As Integer
Dim yp As Integer

Dim x As Integer
Dim y As Integer

Dim xst As Integer
Dim yst As Integer

Dim i As Integer
Dim k As Integer
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Dim isM As Boolean

Dim prevpathlen As Integer

Sheets("Task").Activate
For k = 0 To 19 Step 1
    For i = 0 To 19 Step 1

        ActiveSheet.Cells(k + 2, i + 2).Select
        If Selection.Interior.Pattern = xlSolid And Selection.Interior.Color = 65535 Then
        xst = i
        yst = k
        i = 10
        k = 10
        End If
    Next i
Next k


    i = 0
    pathlong = i
    PATH(i).x_p = xst
    PATH(i).y_p = yst
    drwpath xst, yst

    x = xst
    y = yst

    xp = x
    yp = y

Do

    Do

        Range("A1").Select

        Application.ScreenUpdating = True

            If MsgBox("Next Step", vbOKCancel) = 2 Then
                Exit Sub
            End If

        If m_Down(x, y, xp, yp) = True Then
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        If finpath(x, y + 1) = False Then
            isM = True
            xp = x
            yp = y
            x = x
            y = y + 1
            i = i + 1
            pathlong = i
            PATH(i).x_p = x
            PATH(i).y_p = y
            drwpath x, y
        Else
            isM = False

            delpoint x, y
            i = i - 1
            pathlong = i
            PATH(i).x_p = xp
            PATH(i).y_p = yp


            Dwm_b x, y
            CAR(y, x).bottom_b = True
            If y < 19 Then
                CAR(y + 1, x).top_b = True
            End If

            x = xp
            y = yp

            If i = 0 Then
            xp = PATH(i).x_p
            yp = PATH(i).y_p
            Else
            xp = PATH(i - 1).x_p
            yp = PATH(i - 1).y_p
            End If

        End If

    ElseIf m_Right(x, y, xp, yp) = True Then

        If finpath(x + 1, y) = False Then
            isM = True
            xp = x
            yp = y
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                x = x + 1
                y = y
                i = i + 1
                pathlong = i
                PATH(i).x_p = x
                PATH(i).y_p = y
                drwpath x, y
        Else
            isM = False

            delpoint x, y
            i = i - 1
            pathlong = i
            PATH(i).x_p = xp
            PATH(i).y_p = yp

            Dwm_r x, y
            CAR(y, x).right_b = True
             If x < 19 Then
                 CAR(y, x + 1).left_b = True
            End If

            x = xp
            y = yp

            If i = 0 Then
            xp = PATH(i).x_p
            yp = PATH(i).y_p
            Else
            xp = PATH(i - 1).x_p
            yp = PATH(i - 1).y_p
            End If

        End If

    ElseIf m_Left(x, y, xp, yp) = True Then

        If finpath(x - 1, y) = False Then
            isM = True
            xp = x
            yp = y
            x = x - 1
            y = y
            i = i + 1
            pathlong = i
            PATH(i).x_p = x
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                    PATH(i).y_p = y
                    drwpath x, y
                Else
                    isM = False

                    delpoint x, y
                    i = i - 1
                    pathlong = i
                    PATH(i).x_p = xp
                    PATH(i).y_p = yp

                    Dwm_l x, y
                    CAR(y, x).left_b = True
                     If x > 0 Then
                        CAR(y, x - 1).right_b = True
                    End If

                    x = xp
                    y = yp

                    If i = 0 Then
                    xp = PATH(i).x_p
                    yp = PATH(i).y_p
                    Else
                    xp = PATH(i - 1).x_p
                    yp = PATH(i - 1).y_p
                    End If

                End If

            ElseIf m_Up(x, y, xp, yp) = True Then

                If finpath(x, y - 1) = False Then
                    isM = True
                    xp = x
                    yp = y
                    x = x
                    y = y - 1
                    i = i + 1
                    pathlong = i
                    PATH(i).x_p = x
                    PATH(i).y_p = y
                    drwpath x, y
                Else
                    isM = False
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            delpoint x, y
            i = i + 1
            pathlong = i
            PATH(i).x_p = xp
            PATH(i).y_p = yp

            Dwm_t x, y
            CAR(y, x).top_b = True
            If y > 0 Then
                CAR(y - 1, x).bottom_b = True
            End If

            x = xp
            y = yp

            If i = 0 Then
            xp = PATH(i).x_p
            yp = PATH(i).y_p
            Else
            xp = PATH(i - 1).x_p
            yp = PATH(i - 1).y_p
            End If

        End If

    Else
        isM = False

            delpoint x, y
            i = i - 1
            pathlong = i
            PATH(i).x_p = xp
            PATH(i).y_p = yp


        CAR(y, x).top_b = True
         If y > 0 Then
                CAR(y - 1, x).bottom_b = True
        End If
        CAR(y, x).bottom_b = True
        If y < 19 Then
                CAR(y + 1, x).top_b = True
        End If
        CAR(y, x).right_b = True
        If x < 19 Then
                CAR(y, x + 1).left_b = True
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            End If
            CAR(y, x).left_b = True
            If x > 0 Then
                    CAR(y, x - 1).right_b = True
            End If

            Dwm x, y

                x = xp
                y = yp

                If i = 0 Then
                xp = PATH(i).x_p
                yp = PATH(i).y_p
                Else
                xp = PATH(i - 1).x_p
                yp = PATH(i - 1).y_p
                End If

        End If

    Loop While isM = True

Loop While i < 401

End Sub

Sub Dwm_r(x As Integer, y As Integer)

    Sheets("Solving").Activate
    ActiveSheet.Cells(y + 2, x + 2).Select
    Selection.Borders(xlEdgeRight).LineStyle = xlContinuous

End Sub

Sub Dwm_l(x As Integer, y As Integer)

    Sheets("Solving").Activate
    ActiveSheet.Cells(y + 2, x + 2).Select
    Selection.Borders(xlEdgeLeft).LineStyle = xlContinuous

End Sub

Sub Dwm_t(x As Integer, y As Integer)

    Sheets("Solving").Activate
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    ActiveSheet.Cells(y + 2, x + 2).Select
    Selection.Borders(xlEdgeTop).LineStyle = xlContinuous

End Sub

Sub Dwm_b(x As Integer, y As Integer)

    Sheets("Solving").Activate
    ActiveSheet.Cells(y + 2, x + 2).Select
    Selection.Borders(xlEdgeBottom).LineStyle = xlContinuous

End Sub

Sub Dwm(x As Integer, y As Integer)

    Sheets("Solving").Activate
    ActiveSheet.Cells(y + 2, x + 2).Select
    Selection.Borders(xlEdgeTop).LineStyle = xlContinuous
    Selection.Borders(xlEdgeBottom).LineStyle = xlContinuous
    Selection.Borders(xlEdgeLeft).LineStyle = xlContinuous
    Selection.Borders(xlEdgeRight).LineStyle = xlContinuous

End Sub

Function m_Down(x As Integer, y As Integer, xprev As Integer, yprev As Integer) As Boolean

If y <> 19 Then

    If CAR(y + 1, x).top_b = False Then
        If Not (x = xprev And y + 1 = yprev) Then
            m_Down = True
        Else
            m_Down = False
        End If
    Else
        m_Down = False
    End If

Else
    m_Down = False
End If

End Function

Function m_Up(x As Integer, y As Integer, xprev As Integer, yprev As Integer) As Boolean
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If y <> 0 Then

    If CAR(y - 1, x).bottom_b = False Then
        If Not (x = xprev And y - 1 = yprev) Then
            m_Up = True
        Else
            m_Up = False
        End If
    Else
        m_Up = False
    End If

Else
    m_Up = False
End If

End Function

Function m_Right(x As Integer, y As Integer, xprev As Integer, yprev As Integer) As Boolean

If x <> 19 Then

    If CAR(y, x + 1).left_b = False Then
        If Not (x + 1 = xprev And y = yprev) Then
            m_Right = True
        Else
            m_Right = False
        End If
    Else
        m_Right = False
    End If

Else
    m_Right = False
End If

End Function

Function m_Left(x As Integer, y As Integer, xprev As Integer, yprev As Integer) As Boolean

If x <> 0 Then

    If CAR(y, x - 1).right_b = False Then
        If Not (x - 1 = xprev And y = yprev) Then
            m_Left = True
        Else
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                m_Left = False
            End If
        Else
            m_Left = False
        End If

Else
    m_Left = False
End If

End Function

Function finpath(x As Integer, y As Integer) As Boolean

    Dim i As Integer
    For i = 0 To pathlong Step 1
        If PATH(i).x_p = x And PATH(i).y_p = y Then
            finpath = True
            Exit For
        End If
    Next i

    If i > pathlong Then
        finpath = False
    End If

End Function

Sub drwpath(x As Integer, y As Integer)

    Sheets("Solving").Activate
    ActiveSheet.Cells(y + 2, x + 2).Value = "+"

End Sub

Sub delpoint(x As Integer, y As Integer)

    Sheets("Solving").Activate
    ActiveSheet.Cells(y + 2, x + 2).Value = ""

End Sub

Sub clpath()

    Sheets("Solving").Activate
    Range("B2:U21").ClearContents
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End Sub

Sub allbclear()

    Sheets("Solving").Activate
    Range("B2:U21").Select
    Selection.Borders(xlDiagonalDown).LineStyle = xlNone
    Selection.Borders(xlDiagonalUp).LineStyle = xlNone
    Selection.Borders(xlEdgeLeft).LineStyle = xlNone
    Selection.Borders(xlEdgeTop).LineStyle = xlNone
    Selection.Borders(xlEdgeBottom).LineStyle = xlNone
    Selection.Borders(xlEdgeRight).LineStyle = xlNone
    Selection.Borders(xlInsideVertical).LineStyle = xlNone
    Selection.Borders(xlInsideHorizontal).LineStyle = xlNone
    Range("A1").Select

    Erase PATH
    Erase CAR

End Sub
```