# Determine Warnings VI

## Goal

Modify a VI to use a Case structure to make a software decision.

## Description

Starting with a pre-generated VI, a warning string is generated depending on the relationship of the VI inputs. However, a situation could occur that causes the VI to work incorrectly. The user could enter a maximum temperature that is less than the minimum temperature. Modify the VI to generate a different string to alert the user to the error: `Upper Limit < Lower Limit`. Set the **Warning?** indicator to True to indicate the error.

## Design

Modify the flowchart created for the original Determine Warnings VI as shown in Figure 1.
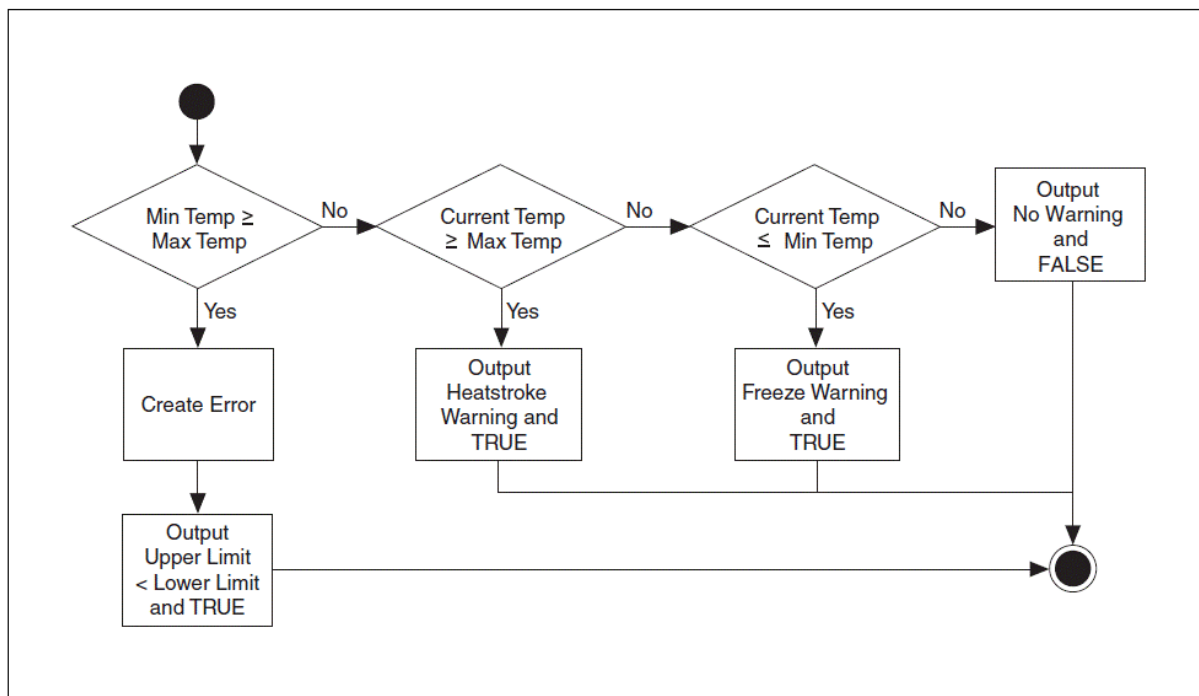


**Figure 1.** Modified Determine Warnings Flowchart

The original block diagram for the Determine Warnings VI appears in Figure 2. This VI must have a Case structure added to execute the code if the maximum temperature is greater than or equal to the minimum

temperature. Otherwise, the code will not execute. Instead, a new string is generated and the **Warning?** indicator is set to True.
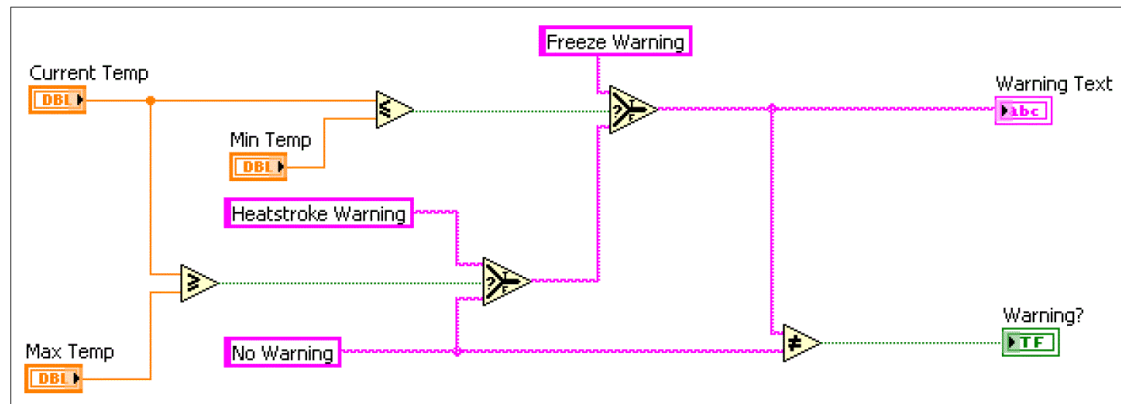


**Figure 2.** Determine Warnings VI Block Diagram

## Implementation

Complete the following instructions to modify the block diagram similar to that shown in Figure 3. This VI is part of the temperature weather station project.
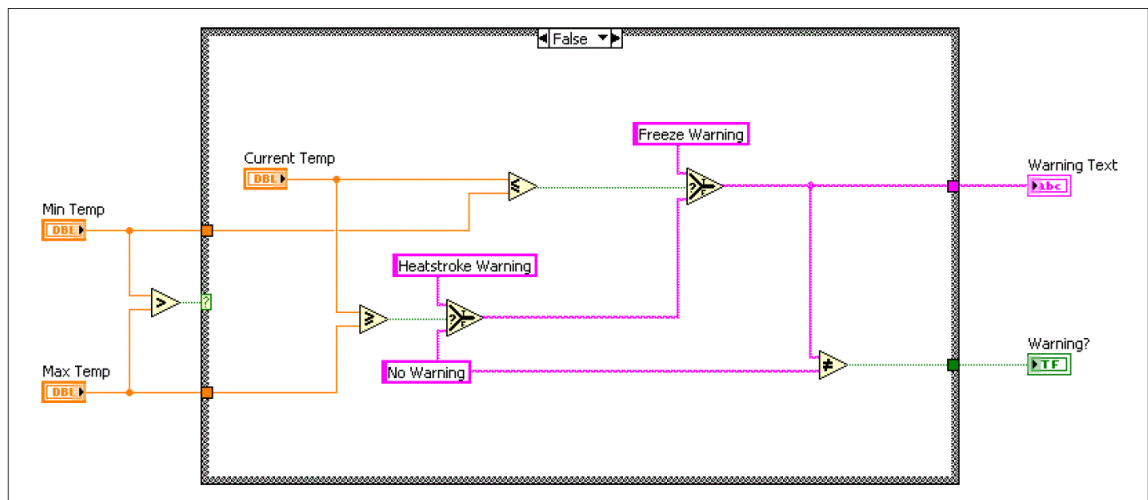


**Figure 3.** Determine Warnings VI Block Diagram

The files you need to complete this exercise are here: `<NI elearning>\ LV Core 1\Case Structure\Exercise`.

1. Open the Determine Warnings VI in the `<Exercise>` directory.

2. Open the block diagram.

3. Create space on the block diagram to add the Case structure.

   The **Max Temp** and **Min Temp** controls and the **Warning Text** and **Warning?** indicators should be outside of the new Case structure, because both cases of the Case structure use these indicators and controls.

   ❑ Select the **Min Temp** and **Max Temp** control terminals.

**Tip** To select more than one item press the <Shift> key while you select the items.

   ❑ While the terminals are still selected, use the left arrow key on the keyboard to move the controls to the left.

**Tip** Press and hold the <Shift> key to move the objects in five pixel increments.

   ❑ Select the **Warning Text** and **Warning?** indicator terminals.

   ❑ Align the terminals by selecting **Align Objects»Left Edges**.

   ❑ While the terminals are still selected, use the right arrow key on the keyboard to move the indicators to the right.

4. Compare **Min Temp** and **Max Temp**.

   ❑ Add the Greater? function to the block diagram.

   ❑ Wire the **Min Temp** output to the **x** input of the Greater? function.

   ❑ Wire the **Max Temp** output to the **y** input of the Greater? function.

   ❑ Add a Case structure around the block diagram code, except for the excluded terminals.

   ❑ Wire the output of the Greater? function to the case selector of the Case structure.

5. If **Min Temp** is less than **Max Temp**, execute the code that determines the warning string and indicator.

   ❑ While the True case is visible, right-click the border of the Case structure, and select **Make This Case False** from the shortcut menu. When you create a Case structure around existing code, the code is automatically placed in the True case.

6. If **Min Temp** is greater than **Max Temp**, create a custom string for the **Warning Text** indicator and set the **Warning?** indicator to True, as shown in Figure 4.
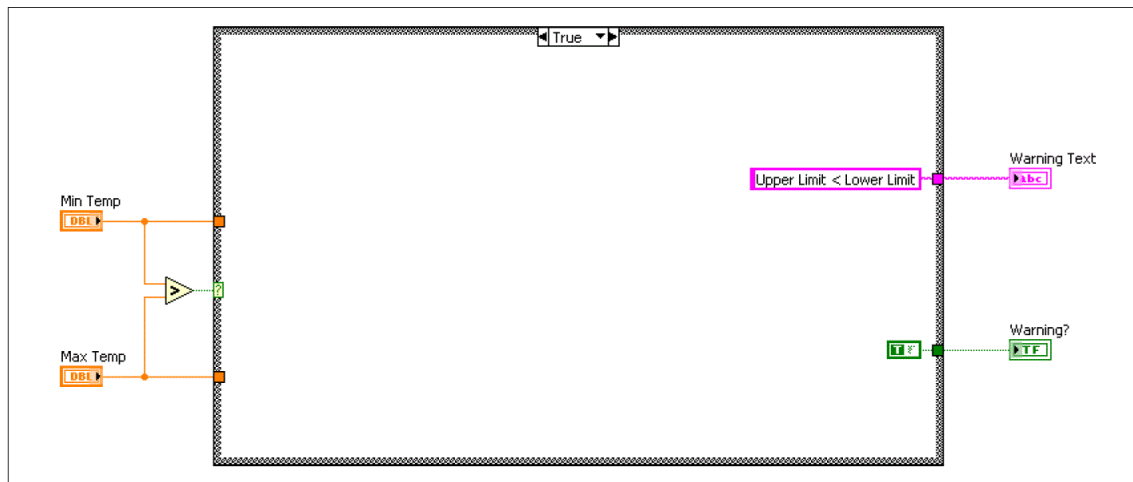


**Figure 4.** Determine Warnings VI Block Diagram

❏ Select the **True** case.

❏ Right-click the string output tunnel.

❏ Select **Create»Constant**.

❏ Enter `Upper Limit < Lower Limit` in the constant.

❏ Right-click the Warning? output tunnel.

❏ Select **Create»Constant**.

❏ Use the Operating tool to change the constant to a True constant.

7. Save the VI.

## Test

1. Switch to the front panel of the VI.

2. Resize the **Warning Text** indicator to a length to accommodate the new string.

3. Test the VI by entering values from Table 1 for Current Temp, **Max Temp**, and **Min Temp**, and running the VI for each set of data.

Table 1 shows the expected Warning Text and Warning? Boolean value for each set of data.

**Table 1.** Testing Values for Detemine Warnings VI

| Current Temp | Max Temp | Min Temp | Warning Text | Warning? |
|---|---|---|---|---|
| 30 | 30 | 10 | `Heatstroke Warning` | True |
| 25 | 30 | 10 | `No Warning` | False |
| 10 | 30 | 10 | `Freeze Warning` | True |
| 25 | 20 | 30 | `Upper Limit < Lower Limit` | True |

4. Save and close the VI.

## End of Exercise

# Notes