Debugging/Bug Reporting Exercise

In this exercise, you are given a failure symptom that Pex's behavior is not consistent with what one may expect, and you are asked to diagnosis to report a suspected failure-inducing condition (of the code in the PUT) for causing such failure symptom.

**Failure symptom:** At the end of Pex's exploration of the PUT, Pex turns a symbolic input (a parameter of the parameterized unit test) into a concrete value. In particular, after running Pex against the code below, the following two entries of the test-data table show that the mid value is not symbolic while all the other entries show that mid is symbolic.

<table>
<thead>
<tr>
<th>mid</th>
<th>is symbolic?</th>
<th>Path Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td><strong>False</strong></td>
<td>return mid == 0;</td>
</tr>
<tr>
<td>int.MaxValue</td>
<td><strong>False</strong></td>
<td>Path Condition: return mid == int.MaxValue;</td>
</tr>
</tbody>
</table>

To reproduce the symptom, conduct the following two steps:

1. Click [http://pex4fun.com/default.aspx?language=CSharp&sample=_Template](http://pex4fun.com/default.aspx?language=CSharp&sample=_Template) (or keep clicking the "New" menu as the last one near the top to get to the mode of "The code is a puzzle.", not the mode of "This puzzle is an interactive Coding Duel.", as indicated by the line above the code editing box)
2. Step 2. Make sure that you include the following code snippet in the code editing box:

```csharp
using System;
using Microsoft.Pex.Framework;
using Microsoft.Pex.Framework.Settings;

[PexClass]
public class Program
{
    [PexMethod(TestEmissionFilter=PexTestEmissionFilter.All)]
    public static string testMethod(int mid)
    {
        bool flag = true;
        string queryText = "SELECT Role FROM Users WHERE MID =" + mid + " AND ROLE = 'teacher';
        if (queryText.Length > 57)
            flag = false;
        return "mid is symbolic?: " + PexSymbolicValue.IsSymbolic<int>(mid) + "; Path Condition: " + PexSymbolicValue.GetPathConditionString();
    }
}
```