Working with Conditions: Insurance Premium Calculation Worksheet

Skills:
- Named cells and ranges; Problem solving skills; Flowcharts; Formulas; Functions; Conditionals

Problem:
In this exercise you will work with a spreadsheet, Insurance.xlsx (found on BB in the Resources area), containing the following information for a group of drivers:

<table>
<thead>
<tr>
<th>Name</th>
<th>Age (years)</th>
<th>Annual Income</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Your task is to set-up the worksheet with necessary formulas to calculate the insurance premium for each driver. The insurance company you work for has the following rules for calculating the premium:

- The premium is $1,000 for a driver between 30 to 55 years, making over $50,000 in annual income and 0 points on driving record.
- A surcharge of $100 is applied to the premium for every point on the record.
- A surcharge of $125 applies to all drivers outside the age group of 30-55 years.
- A surcharge of $50 is applied if the driver income is less than $50,000.
- A discount of $50 is given if the annual income is more than $80,000

Using the above rules, first set up a flowchart to show the problem logic. Next, write the appropriate formulas to perform calculations.

Part 1: Flowchart

Begin by developing the flowchart first. Assume a $1000 standard premium for every driver to begin with as stated in the problem. This premium will be adjusted through different surcharges and
discounts. To keep things simple, calculate all surcharges and discounts separately and adjust the standard premium at the end.

The beginning of the problem the flowchart (and thus solving the problem) is given for you:

1. In flowcharts, outcomes or calculations which do not depend on a condition can be represented using a rectangle with the outcome or calculation written in it. Following the surcharge rule for points, calculate the surcharge through the following calculation. Obviously, if there are no points for the driver in question, the result of this calculation will be zero.

   Points_Surcharge = 100* Points

2. Now look at age surcharge calculation. The age surcharge rule says that if the age is within 30-55 years, the surcharge is 0; otherwise it is $125. This implies a conditional calculation using one or more IF function. In a flowchart, a conditional calculation is represented by a diamond shape (see page 73 in your text). Draw a single section of the flowchart using at least one (possibly more) conditional calculation and two outcomes of that calculation.

3. Continue with the piece of the flowchart for income surcharge or discount. Again, you will need to use a conditional calculation.

4. Now, combine the results of all surcharges in a single flowchart.

Part 2: Translating flowchart to Excel

1. You are now ready to write formulas. Write the formulas using Names. For example, cells B2:B11 should have the name “Age.” Similarly, you should use the Names “Income” and “Points” in your formulas.

2. In your spreadsheet, you can write separate formulas for surcharges/discounts in different columns and add the result. You could also write one combined formula if you wish.

Submit:

Turn in your completed flowchart. Additionally, write the series of formulas (or single, combined formula) you used for calculating surcharges/discounts and total premium. Make sure that all names are on the document. You do not need to submit your spreadsheet.