Profit/Loss Criterion

This exercise builds on the previous exercises of Logistic Regression.

To determine reasonable values for profit and loss information, we need to consider the outcomes and the actions that you would take given knowledge of these outcomes. For the personal loan case, there are two possible outcomes (Accept and Not Accept) for our two possible actions (Send Invitation and Ignore). Taken together, there are four outcome-and-action combinations. Costs and profits are as follows:

- Cost of sending an invitation: $40
- Average profit for accepted invitations: $540
- For simplicity, the bank assumes that customers who are ignored do not take personal loans.

Profit Matrix

	Send Invitation	**Ignore**
Accept ( )		
Not Accept ( )		

Decision Rules

1. **Adding Decisions**
   Steps: Assess ➔ Decisions
   - Connect it with the Data Partition

2. **Creating Profit Matrix**
   Steps: Select Decisions node
   - Change Apply Decisions from No to Yes
   - Click the ellipsis button next to Custom Editor
   - Click Build to create profit matrix
   - Click Decisions tap ➔ Select Yes and Enter Decision Names (Send and Ignore)
   - Click Decision Weights tap ➔ Enter corresponding profits for each cell
   - Click OK to close the window

3. **Adding Regression node for Profit/Loss Criterion**
   Steps: Model ➔ Regression
   - Change Selection Model (under Model Selection) from None to Backward
   - Change Selection Criterion to Validation Profit/Loss
   - Run and view the Results
   - Renaming the node: Right-Click ➔ Select Rename ➔ Type "Regression: Profit/Loss"
   - **What is the expected average profit for each new customer of the model?**

   - **What would be the expected total profit for 5000 new customers of the model?**

   - **Compared to a naïve campaign that will send an invitation to all customers, how much profits can be increased with this model when we have 5000 new customers? For simplicity, let's assume that 10% of previous customers accepted the invitation.**

4. **Model Implementation**

   Steps: Disconnect Score node from Regression: Optimal and connect it with Regression: Profit/Loss

   - **Which customers are recommended for sending invitations?**

   - **Which customer is classified as "NotAccept" but recommended for sending an invitation?**

   - **Why is the customer recommended for sending an invitation? What is the cut-off value for decisions?**