Assignment 2

Instructions:

1. Read the following text and answer the questions that follow.

Text:

A company produces two types of products, X and Y. The production of product X requires 2 hours of labor and 3 hours of machine time, while the production of product Y requires 1 hour of labor and 4 hours of machine time. The company has a total of 60 hours of labor and 80 hours of machine time available per week. The profit for each unit of product X is $5, and for product Y is $7. The company wants to maximize its profit.

Questions:

1. Formulate a linear programming model to solve this problem.
2. Solve the model using the graphical method.
3. Solve the model using the simplex method.
4. Interpret the solution in the context of the problem.

2. Consider the following transportation problem:

<table>
<thead>
<tr>
<th>From</th>
<th>To 1</th>
<th>To 2</th>
<th>To 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>10</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>B</td>
<td>20</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>C</td>
<td>30</td>
<td>35</td>
<td>40</td>
</tr>
</tbody>
</table>

The supply capacities at each source are 50, 70, and 80 units, respectively, and the demands at each destination are 60, 70, and 70 units, respectively. The transportation costs per unit are given in the table above. The company wants to minimize the total transportation cost.

Questions:

1. Formulate a linear programming model to solve this problem.
2. Solve the model using the northwest corner method.
3. Solve the model using the Vogel's approximation method.
4. Interpret the solution in the context of the problem.