CMSC5724: Exercise List 10

Problem 1. Use the recursive algorithm shown on Slide 8 of the lecture notes to find the frequent itemsets from the following dataset $S$, assuming $\text{minsup} = 2$:

<table>
<thead>
<tr>
<th>id</th>
<th>transaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>{a,b,c}</td>
</tr>
<tr>
<td>2</td>
<td>{a,c}</td>
</tr>
<tr>
<td>3</td>
<td>{a,d}</td>
</tr>
</tbody>
</table>

Recall that this algorithm finds at Line 6 an item $z$. You should follow the choice of FP-growth, namely, implement Line 6 as “$z$ = the least frequent item in $S$”.

Problem 2. Draw the FP-tree of following dataset $S$, assuming $\text{minsup} = 2$:

<table>
<thead>
<tr>
<th>id</th>
<th>items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>{a,b,c,d}</td>
</tr>
<tr>
<td>2</td>
<td>{a,b,c,e}</td>
</tr>
<tr>
<td>3</td>
<td>{a,b,d,e}</td>
</tr>
<tr>
<td>4</td>
<td>{a,c,d}</td>
</tr>
<tr>
<td>5</td>
<td>{b,c,d}</td>
</tr>
<tr>
<td>6</td>
<td>{a,b,e}</td>
</tr>
<tr>
<td>7</td>
<td>{a,c}</td>
</tr>
<tr>
<td>8</td>
<td>{b,d,e}</td>
</tr>
<tr>
<td>9</td>
<td>{b,c,d}</td>
</tr>
<tr>
<td>10</td>
<td>{a,c}</td>
</tr>
</tbody>
</table>

Problem 3. Consider again the input set $S$ of transactions in Problem 2. Show the FP-tree conditioned on $e$ (i.e., the FP-tree of the set of transactions that contain $e$), assuming $\text{minsup} = 2$.

Problem 4. Consider again the input set $S$ of transactions in Problem 2. Show the FP-tree conditioned on $d, e$ (i.e., the FP-tree of the set of transactions that contain $d, e$), assuming $\text{minsup} = 2$. 