Going Shopping - How Many Different Ways?

Goal:
This lesson encourages problem solving and parallel thinking by presenting students with a scenario analogous to a problem to be solved by a parallel computer.

Materials:
- Parallel Computing Notebook, 1 per student.

Activity:
1. Each student is given the following scenario:

Aaron and Mobeen are teaching a group of elementary school students about parallel computing, but they forgot to bring lunch! Luckily they have a 12-passenger van and there is a supermarket close by. Aaron, Mobeen, and all of the students pile into the van and head to the store. They need to buy enough lunch for everyone. What are all the different ways of solving this problem?

2. Each student writes out as many different ways of solving the problem as possible.
3. The class reviews some of their solutions. The instructor asks some "what if" questions to question the assumptions of the students (e.g. "what if only Aaron and Mobeen can make the purchases? What if a student has food allergies?"). Then some further questions are asked:

Questions to answer in your Parallel Computing Notebook:
1. Where is there inherent **parallelism** in your solution?
2. Where are there **dependencies** between tasks in your solution?
3. Where is there **communication** in your solution?