An algorithm is a sequence of instructions that perform a given task. Algorithms have been written for many tasks. Tax forms give instructions for you to calculate how much you owe the government. Strategies are given for students to improve their ACT or SAT scores. You can even write algorithms for how to eat a sandwich!

Choose a task for which you want to write an algorithm for. Pick a task which includes one of each of the control structures: sequence, selection, and repetition. Don't write an algorithm for examples used in the book or class. Be creative! It will make life more interesting for the person who is grading your project.

For the given task:
1. Write the algorithm as a set of numbered instructions.
2. Draw a flowchart for the algorithm.
3. Mention several things in your algorithm which could have been more clearly specified.

Since your instructor is quite a chef, he will write an algorithm for making Ramen Noodle soup (the deluxe version).

**Ramen Noodle soup algorithm:**
1. Take a pan and put water in it until it is halfway full.
2. Put a third of a cup of frozen vegetables (your choice!) into the pan.
3. Put the pan on the stove.
4. Turn on the stove.
5. Get a package of Top Ramen Noodles.
6. Take a coffee cup (this is a Java course!) and pound on the package until the noodles are broken up.
7. Open the Ramen Noodle package and dump the crushed noodles into the pan.
8. Wait until the noodles are mushy. Then turn the stove off.
9. Add the flavor pack.
10. Stir until the flavor pack is dissolved in the soup.
11. If cheese is wanted, add three teaspoons of cheese to pan.
Flowchart for Ramen Noodle Soup Algorithm:

- Get a pan
- Is pan half-full?
- Pour water into pan
- Put third of a cup of frozen vegetables
- Take cup and pound bag once
- Are noodles broken up?
- Get package of Top Ramen noodles
- Are noodles broken up?
- Open Ramen Noodle package
- Dump crushed noodles into pan
- Are the noodles mushy?
- Turn stove off
- Add flavor pack
- Add 3 teaspoons of cheese to pan
- Stir
- Flavor pack dissolved?
- Does user want cheese?
- Get input from user if want cheese
- False
- False
- True
- True
- False
- False
- True
- False
- True
- False
- False
- True

An example of a sequence structure is going from “Get a pan” to “Pour water into pan”. An example of a repetition structure is the “Pour water into pan”, “Is pan half-full?” loop. An example of a selection structure if the decision “Does the user want cheese” (it is a single selection structure statement)

Things that could have been more clearly specified:
- How are you supposed to hit the Ramen Noodle package with a coffee cup so that the package does not break?
- How much force are you supposed to use when hitting the package?
- There is no mention of how hot the heating coils on the stove should be.

For submitting the project, follow the guidelines in submissionhomework.doc? For this homework you do not have to submit the flowchart electronically. For the hardcopy (which you are always required to turn in for both labs and projects), staple together the following items:

1) Put this document on the top (Project 1: Algorithms)
2) The flowchart
3) writeup.txt, which has the algorithm as a set of numbered instructions and the description of some aspects of the algorithm that are ambiguous
## Grading

<table>
<thead>
<tr>
<th>Description</th>
<th>Points Worth</th>
<th>Points earned</th>
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<tbody>
<tr>
<td>Creativity - is this algorithm different from those mentioned in the book and class?</td>
<td>10</td>
<td></td>
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<tr>
<td>Does the algorithm include the three control structures?</td>
<td>20</td>
<td></td>
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<td>Do the steps reasonably outline how the task should be done?</td>
<td>30</td>
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<td>Does the algorithm as outlined in the numbered steps match that of the flowchart diagram?</td>
<td>30</td>
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<td>Does the write-up mention places where the algorithm was unclear?</td>
<td>7</td>
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<td>Were the submission guideline followed?</td>
<td>3</td>
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<td>Final Grade:</td>
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