USACO Curriculum

Introduction

Largely speaking, the working hours of USACO cannot be counted in terms of hours you put in. Computer Science is mainly about problem-solving skills and logical thinking. More importantly it is about implementation of the solution. Both are artistic (patience + method + thinking) requiring a lot of scientific background although development is more methodical and very little art. How soon one gets ingrained in these is individual centric. A proper training and practice may shorten the period to achieve a level but to win a competition also depends on the competitors involved and other factors.

Content

The content of USACO bronze/silver is highly related to the implementable aspects of an introductory algorithms course.

1. sorting
2. binary search
3. greedy
4. recursion/enumerative search
5. flood-fill
6. depth-first/breath-first search
7. minimum spanning trees
8. shortest paths
9. dynamic programming (variants of knapsack, edit distance, and traveling salesperson)

Preparation

1. 12 weeks intensive practice, 2 classes per week, 2 hours per class. I will assign a training book which contains hundreds of sample questions.

2. Do 4-6 hard questions in class and do about 15-20 similar level problems per week. Focus on single sections until you reach about 80% saturation. Stop once you reach a solve count of about 300. Some of these problems are REALLY EASY.

3. Assuming you start now, these two should let you place into gold at the first contest by getting good scores on bronze/silver. This is crucial because the number of gold contests varies each year and it is intensively challenging.