# COMPUTER SCIENCE
# SCHEME LAB 0

The goal of this lab is to introduce you to some of the skills that a computer programmer, a computer analyst, a software salesperson, or a customer service person needs. The first three are algebra word problems that relate to scheduling, computer games, and basic business programs. The fourth one concerns geometry, which is needed to determine graphical layouts. The last one is about interacting with people, an extraordinarily important skill for a programmer.

**Problem 1:**
A boy gets hired by his parents' condo association to sweep the sidewalk in the summer and to shovel the snow in the winter. Just to make sure he works for the association, he gets 20 dollars a month; he doesn't have to work for that. For every hour he needs to sweep or shovel, he gets min wage of $7.25 per hour.

a) How much does he get if he works 2 hours? 5 hours? 10 hours? per month.
b) Make a table that shows the results.
c) Create a formula for calculating how much the boy earns if he works H hours.
d) Use the formula and a calculator to find out how much the boy earns when a snow storm forces him to work for 100 hours in a month.

**Problem 2:**
To launch a rocket, we place it on a pedestal that's 10 meters tall. At t = 0, the engines ignite and the rocket lifts off. So,

| seconds | meters |
|---|---|
| at t = 0 | it is at 10 |
| at t = 1 | it is at 15 |
| at t = 2 | it is at 30 |
| at t = 3 | it is at 55 |
| at t = 4 | it is at 90 |

a) Where is the rocket at t = 5?
b) Write a formula that calculates how high the rocket is, given that t seconds have passed since the launch.
c) Use the formula and a calculator to find out how high it is at t = 10? t = 200? t = 400?

*Adapted from Matthias Felleisen: (http://www.ccs.neu.edu/home/matthias/211-f04/Assignments/1.html) and the Computer Science Equity Alliance: "Exploring Computer Science" Curriculum*

**Problem 3:**
The Youth Soccer League has 6 teams: Jaguars, Bears, Coyotes, Stallions, Eagles, Sharks. Each team must play each other two times in a season. Games will be scheduled on Saturdays. Each team will play a game on every Saturday until the season is completed. Develop a schedule of games for the season. Enter the schedule into a calendar or spreadsheet on the computer. Answer the following questions:

a) How did you develop your schedule?
b) How many games will the Jaguars play this season?
c) How many games total will be played for the league?
d) How many weeks long is the season?
e) What would your answer to questions b,c,d be if there were 30 teams in the league?
f) What would your answer to questions b,c,d be if there were 20 teams playing each other 3 times each?
g) What would your answer to questions b,c,d be if there were *n* teams playing each other *m* times?

**Problem 4:**
Using graph paper provided, draw the following images. You may use only rectangles, isosceles triangles, and circles. You may leave those blank or fill them in with color.

a) Draw a sail boat with two sails, floating on water in a 100 x 100 box. (scale if necessary to fit on the paper)
b) Draw a car driving on top of a black street in a separate 100 x 100 box.

**Problem 5:**
Interview your partner and find out his (or her) experience in the use of computers. Write up the result of the interview as a single paragraph (at most 150 words) that should read as a professional newspaper article. The paragraph should include some basic information about the person you interviewed.