Regarding Last Week

- Chat Session Recap
  - Initial session held on 4/29 and 4/30
  - Total of 3 students attended
  - Archive of 4/29 posted, good discussion of predicate functions, v0 computation (quiz 2)
  - Next sessions schedule for 5/13 and 5/14 (invitations will be sent)

Regarding This Week’s Lab

- 2 parts to the lab (plus extra credit)
- Expected to complete part 1 in class
- Complete part 2 and extra credit (optional) for next lab (in 2 weeks)

Class Overview

- Review
  - sprintf
  - plot options
  - convert
- Propulsion Model
**sprintf()**

- Similar to printf, except it returns a string instead of printing to the screen.
- Useful for formatting a string and using it for something other than immediately printing.
- Same arguments and usage as printf().

```plaintext
string1 := sprintf("The median grade is %.2f", Statistics[Median](scoreList));

The median grade is 74.50
```

**Plot Options**

- We’ve talked about plot options in the past.
- Plot commands take numerous options to specify how the plot should be displayed.

**Some Plot Options**

- title = <string>
  - Gives the graph a title matching the string.
- labels = [<string>, <string>]
  - Gives the graph axis labels.
  - First item in list is x axis label.
  - Second item in list is y axis label.

**Plot Option Example**

```plaintext
plot([seq([i, scoreList[i]], i=1..nops(scoreList))], style=point, color=red, labels = ["Student Number", "Score"]):
```

**convert()**

- Convert command is the “swiss army knife” for convert from almost unit to another (or from one maple type to another).
- Takes at least two parameters: what I’m converting, and what I’m convert to.
**Propulsion Model**

- In this lab we will be studying a propulsion model.
- Models an automobile propulsion system.
  - In terms of two parameters \( v(t) \) and \( u(t) \).
  - Determines how the two parameters relate to one another.

**How the model works**

- Make several tables to store all our variables (\( a(t), v(t), u(t), x(t) \)), and initialize the first time step’s values.
- We choose a small \( \Delta t \), and run a for loop, incrementing time by \( \Delta t \) on each interval.
- We compute the next step’s values using the above formula and the previous step value.

**Propulsion Model Preview**

```plaintext
size := 201;
ui[1] := x[1];
v[i] := 0;
u[i] := b^u[i] - p*v[i];
timethb[i] := 0; # starting time is zero.
x[1] := 0; # starting position is zero.

# Compute values for timethb, x, u, v, and a based on the updated formula given in
for i from 1 to size do
  timethb[i+1] := timethb[i] + dt;
  x[i+1] := x[i] + dt*v[i]; # car position is
  u[i+1] := u[i]; # pedal position is a constant
  v[i+1] := v[i] + a[i] * dt;
  a[i+1] := b^u[i] - p*v[i+1];
end do;
```
What you should do now?

- Connect to class web page: www.cs.drexel.edu/cs123/spring2009
- Start up Maple 12
- Read Lab 3 directions.
- Do the work with your partner(s). Both should try to do the work, but the grader will need to look at only one answer to give you credit for doing the problem.
- We'll be stopping by to check your team's lab 2 final results

Finishing up – save files

- Make sure your name/user id/section number/ date, time/instructor name are on the verification sheet.
- Get the verification sheet signed and handed in.
- Save worksheet on desktop if you haven't done so already.
- Submit a copy to Blackboard site.
- Email a copy to yourself and/or your lab partners as an attachment so you can look at what you did for review purposes later.

Next week – Take quiz 3!

- Take the second quiz, starting next week (monday morning).
- Go to CLC if you need face-to-face help
- Don't wait until the last minute to discover that you needed more time to complete the quiz!
- Complete lab 3 (part 2 and extra credit)!
- Next Chat Sessions on 5/13 and 5/14 (9:30-10:30pm)!