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1 Purposes of the Report

Your Micromouse Design Report (henceforth the report) has a few purposes. The primary purpose is for you to summarize all the activities over the past three quarters. This allows a reader to understand your process of design, experimentation, implementation and problem solving.

An important secondary purpose is for me to assign a grade. In this outline, I will indicate the grading standard for the report throughout the sections.

2 Format

The format of your report is semi formal. You should use double spacing with 10 point or 12 point font size. Diagrams and pictures should be numbered so you can refer to them by number. References should be provided at the end of the report (to data sheets, web sites and etc.).

The first page should have the name of team and names of the members. Do not include SS# as that is not necessary. The report should be dated on the first page. Please have all members sign on the first page to "sign off" (acknowledge the release of) the report.

Because the report is going to be a little thick, please bind the report by some means. You can use a cheap 3-ring binder, you can use Kinko's binding service (of that of Office Max, etc.). Each section should have the author's or authors' name(s) next to the heading. This allows me to evaluate who did what. If your group has a member serving as a reviewer or editor, indicate so at the beginning of the report.

Data sheets, mechanical drawings and other appendix items should be appended at the end. It helps to have numbered appendices so that you can refer to the appendices in the report.

3 Sections

The outline of a report is roughly as follows:

- Introduction: This section introduces the reader to a micromouse, then introduces the reader to your particular micromouse.

  - General Micromouse: Describe the rules that affect how a micromouse is designed. What is considered a good design?
  - Your mouse: Do not provide details here. Indicate the overall design objectives that your team agrees on.

- Design: This section describes how you design the original micromouse. Do not write down the design of the finished product, you will have another section to do that.
  - Design Specification: What are the specifications of the original design? Do not write down the specifications of the finished product here. Provide reasons for each design specification.
    * mass
    * top speed
    * width of body
    * length of body
    * linear resolution
    * turn resolution
    * sensor sensitivity (minimum skew and offset error detected)
    * energy requirement
    * motor type
  - Design Decisions: The previous section described what the micromouse should do, this section explains how you made decisions on selecting components. For each item, describe the alternatives you have found, and how you selected the particular one used in the design.
    * motor selection: Describe and explain the type (stepper versus DC), energy requirements (in Watts), resolution (for steppers), gearing (if any) and mounting method.
    * wheel selection: Describe the explain the size (diameter and width), materials and mounting method to the drive shaft.
    * energy system: Describe and explain the type (NiMH, NiCd or Li ion), energy storage (in Joules or mAH @ V), maximum internal resistance and discharge curve at the worst case discharge scenario of your micromouse.
    * sensors: Describe and explain the model you have chosen to use.
    * steering design: Describe and explain the type (differential versus steered).

- Experiments This section describes the process in which you confirm whether the parts you selected from the previou chapter work as expected. You need to describe the methods and results.

  - Sensors. How did you set up a test circuit to see if the sensors are of the proper sensitivity? How does pulsing the IrEDs at 1A affect the value of the pull-up resistors?
  - Motors. How did you test the motors, like the maximum noload speed? How did you determine and confirm the power consumption of these motors?
  - Batteries. How did you test the capacity of the batteries at the load of running the maze?

- Implementation The implementation is the process in which you make the product as designed. No design is perfect the first time, few are even correct the first time. In this section, you will discuss the implementation stage in terms of problems encountered, analysis of such problems and solutions to the problems. Since different groups encounter different problems, it is nearly impossible to describe the structure of this section. You may want to use a chronological order. For each problem, be sure to include the following:
  - Description of the problem. What *was* supposed to happen? What *actually* happened? What was the difference between expectation and observation?
  - Analysis of the problem. What led to the problem? How did you experiment and deduce the source of the problem? How did you confirm your analysis?
  - Rectification of the problem. How did you solve the problem? Did you have multiple options to choose from? If so, why did you choose the one that you used?

- Retrospective Analysis Given all the problems you discovered and hopefully fixed in the previous section, how do you think things can be improved? For each improvement item, please include the following:
  - What the problem to be addressed?
  - How should the design itself be modified to address the problem?
  - Does the improvement impact other features? How about the cost?

- Summary The summary section is a section for you to recap the most important points of this project. Its structure is left open for each group to determine.