CSCI 1106
Lecture 8

Project Planning

Announcements

• Friday is Munro Day (university closed)
• Today’s Topics
  – The Project: Robot Olympics
  – Program Planning
  – Strategy
  – Tactics
Robot Olympics

• Consists of 2 events:
  – Bulldozer Rally
  – Obstacle Course

• Your Group’s Tasks:
  – Write a program for each event
  – Compete in the Robot Olympics
  – Write a report on your project

General Rules

• One program per event
  – All two programs must be loaded onto the robot
  – Programs cannot be changed once competition begins

• No human interference
  – You may not touch a robot while it is competing
  – Robots may be disqualified if interference occurs

• Tribot’s performance affects your grades
  – See project specifications for rubric
Bulldozer Rally

- Remove all objects from the arena
- Robot has two 2-minute attempts
- Objects are removed if they are not in contact with the inside of the arena (line is ok)

Obstacle Course

- Move from START to EXIT as quickly as possible
- Robot cannot dislodge objects or leave arena
- Robot has three 2-minute attempts
The Project Report

General Information
• Report is aimed at peers, TAs, & instructor
• 8 pages, 11pt (see template)
• The report must
  – Provide sufficient background
  – Describe the program design, strategy, and tactics
  – **Justify your design decisions**
  – Describe how successful the programs were
  – State overall conclusions
• Rubric in project specification

Recommended Structure
• Title and author information
• Abstract
• Introduction
• Background
• Approach and Implementation
  – Bulldozer Rally
  – Obstacle Course
• Results
• Conclusions and Future Work
• References

Where Do We Start???

• Situation:
  – 5 Labs (+ overtime if need be)
  – 2 Programs
  – 1 Project Report
  – 3 to 4 group members
  – 1 Tribot
• Step 1: Identify the Tasks
  – Develop two programs
  – Write a project report
Steps for Developing a Program

1. Develop program *strategy*
2. Identify *tactics* to implement the strategy
3. Model tactics with state transition diagrams
4. Implement program based on STDs
5. Test your program
6. Refine strategy and tactics as necessary
7. Repeat

Strategy

- How are we going to solve the problem?
  - Typically there is more than one way
  - Can be described in a couple sentences
- Example: Getting to class on time
  - Avoid the rush hour
  - Don’t drive
  - Live in residence
- Example: Preparing for exams
  - Study in advance
  - Cram the night before
Example: The Line Race

Strategies

- Go as quickly as possible, and pay the price of losing the line
- Go slow enough and never lose the line

Strategy (cont.)

- Should be able to describe the strategy in a couple of sentences
- Use one strategy per problem
- A strategy is implemented with tactics
  - Tasks
  - Ideas
  - Concepts
- Each part of the strategy must be implemented with one or more tactics
Tactics

• Tactics are how you implement the strategy
• Example: Cramming
  – Consume lots of sugar and caffeine
  – Play loud music
  – Tie yourself to your desk
• Example: Following the line at full speed
  – Implement a good recovery mechanism
  – Make sure your tires have good traction
• Tactics may be composed of multiple simpler tactics
• How do you put it all together?

Program Planning

• For each event formulate a strategy
  – Convince yourself that you can implement it
  – Identify the tactics you will need
• For each tactic
  – Design a state transition diagram
  – Design corresponding part of the program
• Put the parts together
• How much time will this take?
Project Management

• Determine amount of time to spend on each task:
  – Bulldozer Rally
  – Obstacle Course
  – Project Report

• Note: former two can be done sequentially, the latter in parallel

• Divide up time among tasks: (example)
  – Bulldozer rally (2 lab period)
  – Obstacle course (2 lab period)
  – Project report (homework)

• Notes:
  – Be prepared to adjust your time estimates as the project evolves
  – Group communication and management is very important!