

Maintenance Scheduler for Riding Lawnmower

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Introduction

In an effort to find a practical application for this project, we asked several acquaintances if they were in need of a simple embedded system. Brian learned that his father has just purchased a riding lawnmower with strict service intervals (measured in hours of use) for various maintenance tasks. However, there is no easy way to tell how many hours the mower has been in use. It would be very helpful to him if a small embedded system could count the number of hours the mower has been in use and warn him visually when maintenance needs to be done. He also needs a way to let the system know that the needed maintenance has been completed. We felt this would be a good project because it will be put into use as soon as it is completed.

Objectives and Specifications

- Measure hours of use (total hours and hours until the next scheduled maintenance point)
- Alert when maintenance is needed (values enumerated in Owner's Manual)
- Mechanism to reset maintenance alerts when required maintenance has been performed
- Save memory even if mower battery is removed for a short period of time

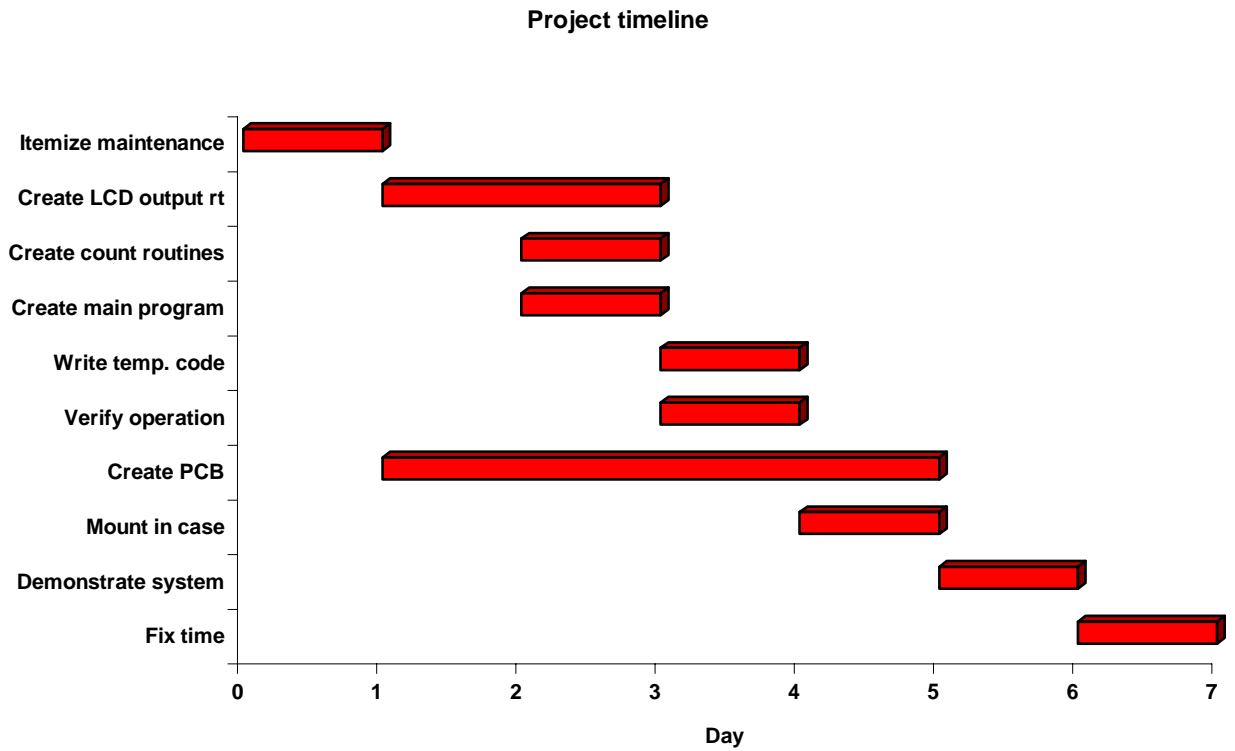
Strategy (Conceptual Design)

- LCD display with one line for total hours used, one for hours until next required maintenance, and two for various flashing maintenance alerts
- Covered switch to reset maintenance alerts and prevent accidental triggering
- Step-down power transformers (12V->5V) to get power from mower battery to power normal operation of PIC and from the key switch to sense the state of the mower (ON or OFF).
- Mount the setup in a small case on a PCB created by the machine shop.

Tasks and priorities

- Itemize maintenance schedule
- Create routines to output to LCD
- Create routines to count based on ON/OFF input
- Create main program to call the routines
- Write temporary code to speed up process (1 hour->5 seconds)
- Verify operation on breadboard
- Create PCB layout, have machine shop create PCB, and solder components on PCB
- Mount system in case
- Demonstrate system
- Change code to proper time-frame and deploy system

Schedule bar-chart



Budget

PIC Chip (small)	\$7
PIC Socket	\$1
Covered Switch	\$3
LCD Display (large)	\$7
Step-down power transformers	\$5
Case to house system	\$7
PCB by machine shop	\$0