

# The LockCracker

Final Project for Principles of Engineering class

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**Aim:** The purpose of this multidisciplinary course was to build a mechatronic system of our choosing. Team JARJ decided on building a lock-cracking device. **The LockCracker was set to take a combination lock** with an unknown combination and unlock it and display the correct combination to the user via a **Python GUI interface**. This flexible electromechanical system should be modifiable to fit any turn-dial lock.

**Solution:** Team JARJ mechanically turned the dial on the lock and pulled on the latch with every combination that was tried. I worked on the electrical and software systems.

## Design:

As follows for the electrical & software subsystems:

1. We used a stepper motor to turn the lock's dial.
2. A pull-in solenoid pulled the lock's latch every time a combination was tried.
3. A limit switch was triggered only when the latch was opened, telling the system to stop trying combinations and to display to the user.
4. We used a PIC microcontroller as the brains behind the controls.
5. We designed a modular Python back-end to fit to any type of lock dial.

Finally, the **user-interface was designed to minimize the time taken** by the LockCracker to solve the lock. The user is prompted to enter how many of the numbers they know of the combination and the LockCracker optimizes the procedure accordingly.

Today, the LockCracker has **received publicity** on Wired.com, Popsci.com, ASME Magazine, and more. Please watch the LockCracker in action at  
<http://youtu.be/Bu7JPcSLYCI>

