Home Automation System
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Abstract:
Home automation system that is designed to be transparent, flexible, and cheaper than currently available systems. System consists of a Raspberry Pi which coordinates the system, and any number of peripheral devices for controlling lights and appliances. A ZigBee mesh network is utilized for communication between the devices.

Features:
- Controls outlets and dims lights
- Monitors power usage
- Touch screen control interface
- Touch screen thermostat
- Scheduling capabilities
- Amazon Alexa compatible
- HTTPS encrypted and login protected

Hardware:

- Lightswitch Assembly
- Hub Assembly
- Light Dimming
- AC Power Measurement

Software:
- Server application written in Python
  - Receives HTTP GET or POST requests in url-encoded or json format using Flask web server library
  - Runs scheduled tasks using APScheduler library
- Touch screen GUI written in Python using Kivy library
- Amazon Lambda Function written in Python for Amazon Alexa Skill

Touchscreen Interface