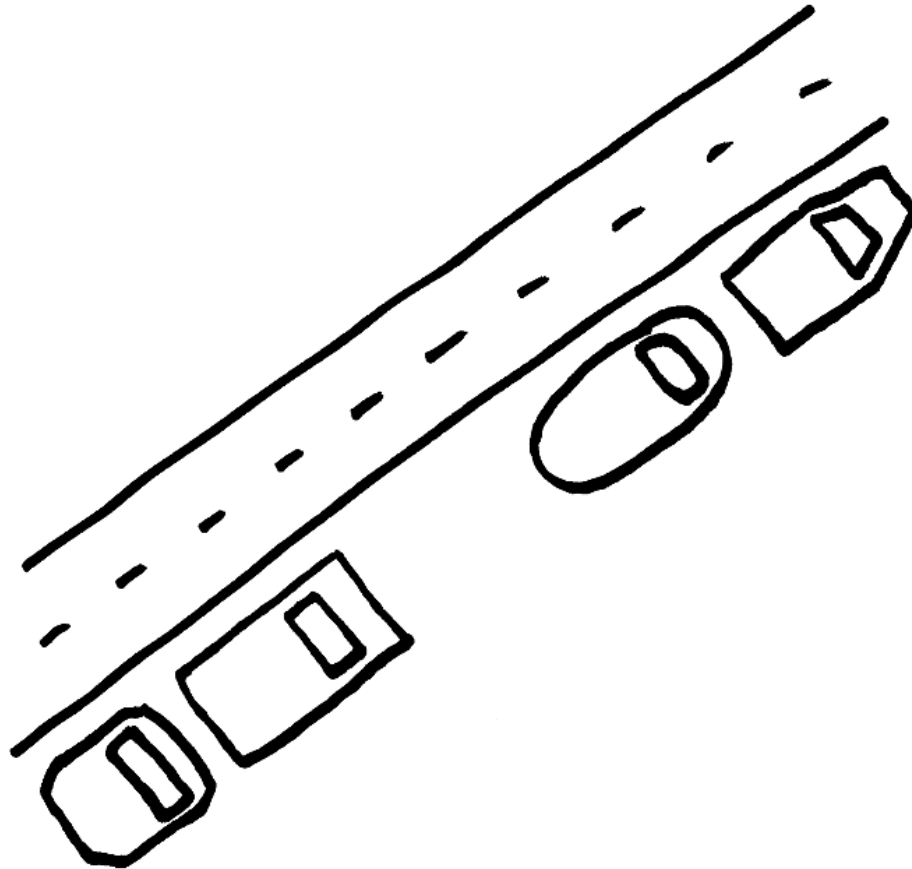


# **Self Parallel-Parking Car**

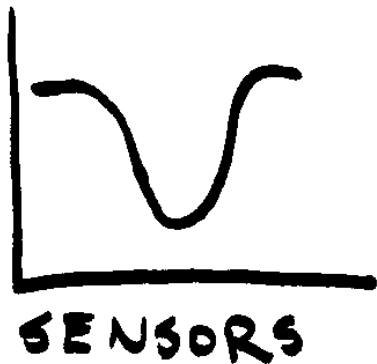
**Illustrated and Presented by Kevin Hsiue and Frank Ni**

**The big idea:  
Parallel parking is usually a pain.**



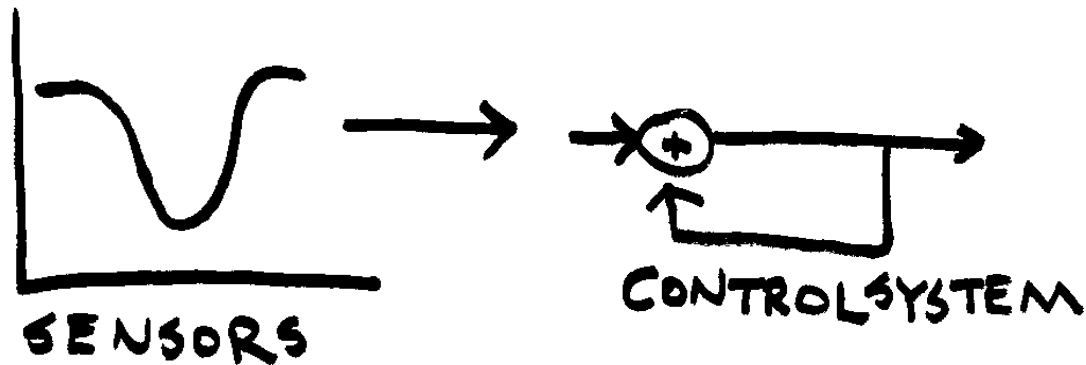
# Relevant ideas:

## Why this is educationally interesting.



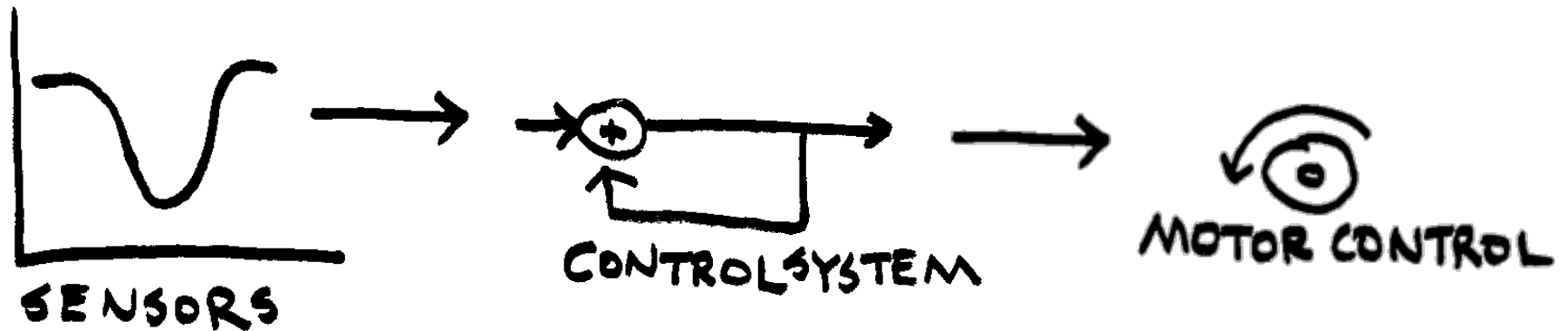
# Relevant ideas:

Why this is educationally interesting.

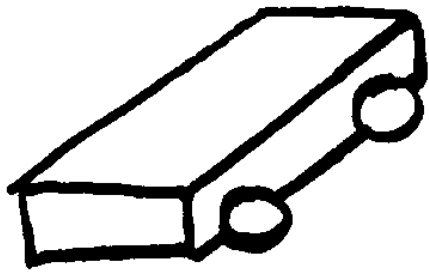


# Relevant ideas:

Why this is educationally interesting.



# Required materials: Building a suitable model.



4WD CHASSIS



2X XBEE MODULE  
+ ADAPTER



4X IR SENSOR



ADC0804  
LM18293

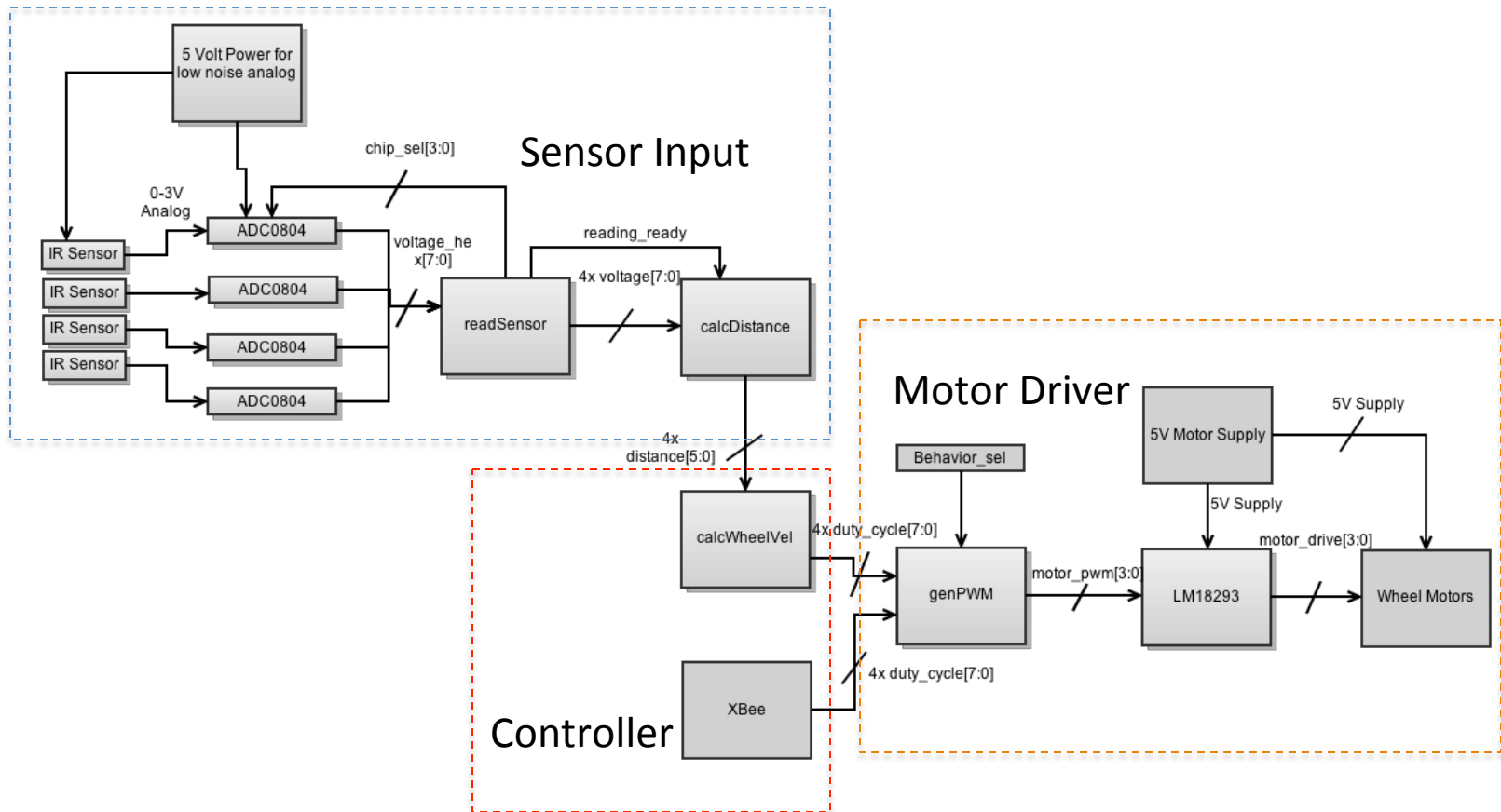


BASYS FPGA

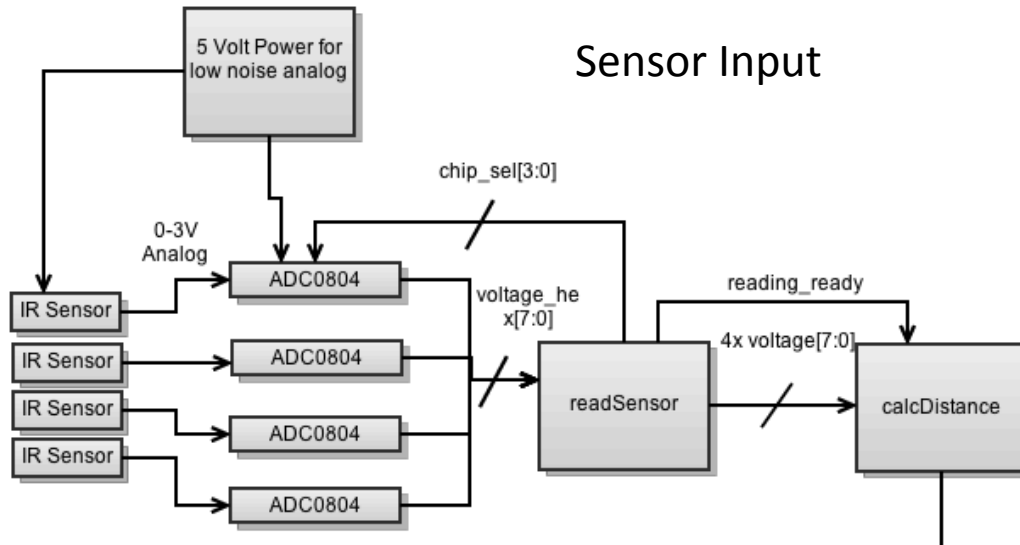


BATTERY SUPPLY

# Block diagram: Abstracting the challenge into smaller pieces.



# Block diagram: Abstracting the challenge into smaller pieces.



- Mount four sensors in optimal positions
- Use ADC to convert voltage to eight byte hex value
- readSensor module cycles through the 4 ADC
- lets calcDistance know when it is ready
- calcDistance converts the voltages into a distance value

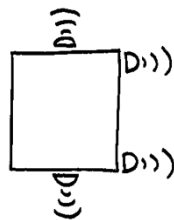


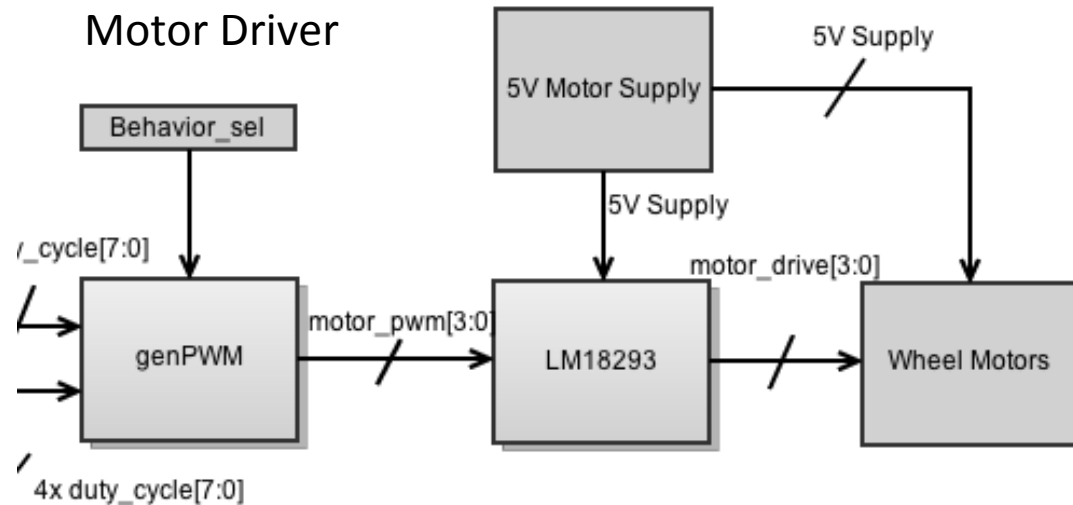
Image courtesy of SparkFun.com



# Block diagram: Abstracting the challenge into smaller pieces.

Image courtesy of SparkFun.com

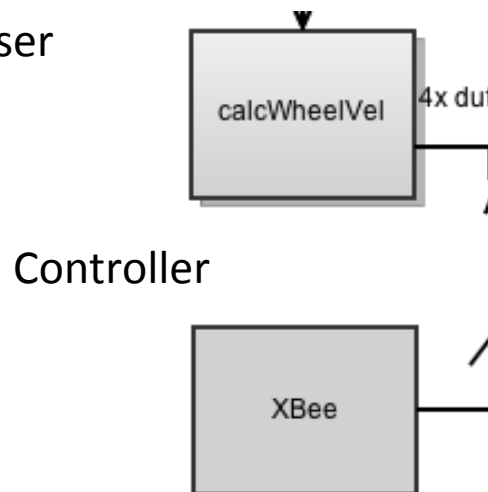
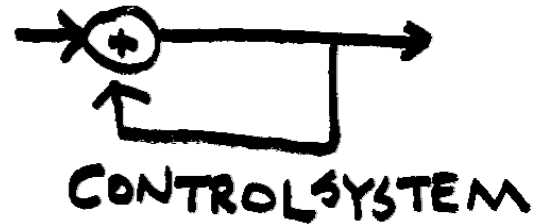
- genPWM module uses duty cycle input to create PWM
- PWM is fed to LM18293 to control vehicle
- Separate supply to isolate noise



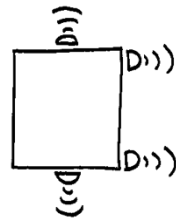
# Block diagram:

Abstracting the challenge into smaller pieces.

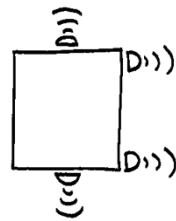
- calcWheelVel is a feedback controller implemented via FSM
- Use XBee to control the vehicle wirelessly
- Behavior is selected by user



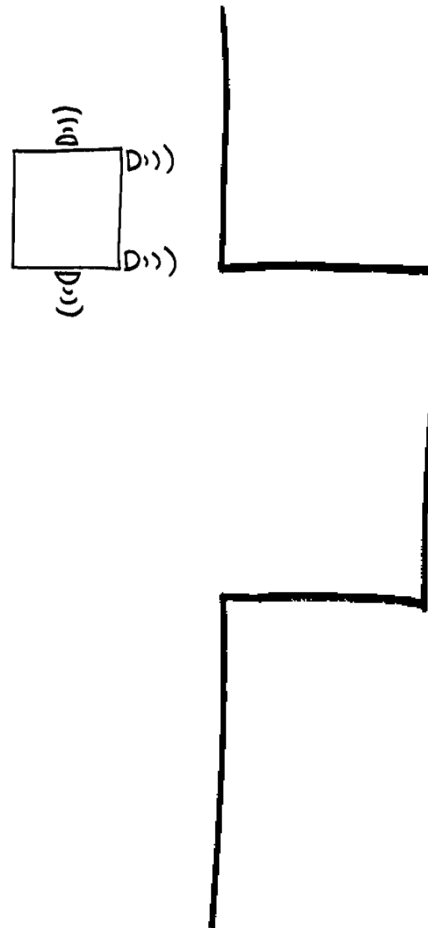
# Plan of attack: Solving a set problem.



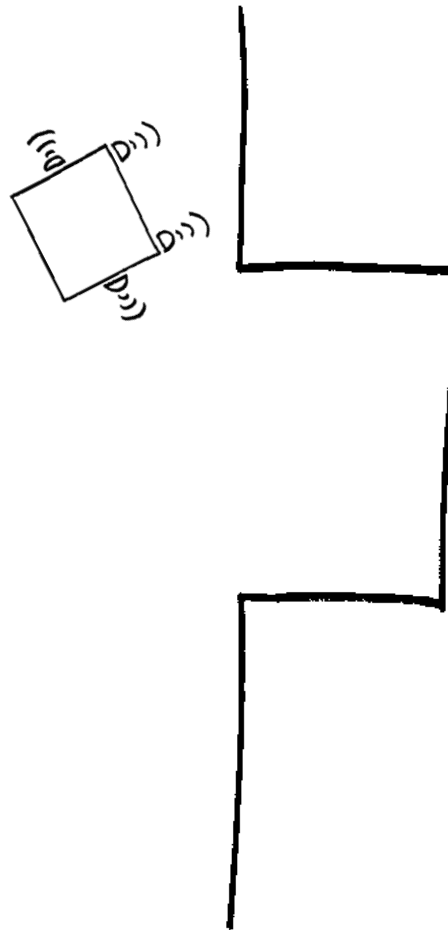
# Plan of attack: Solving a set problem.



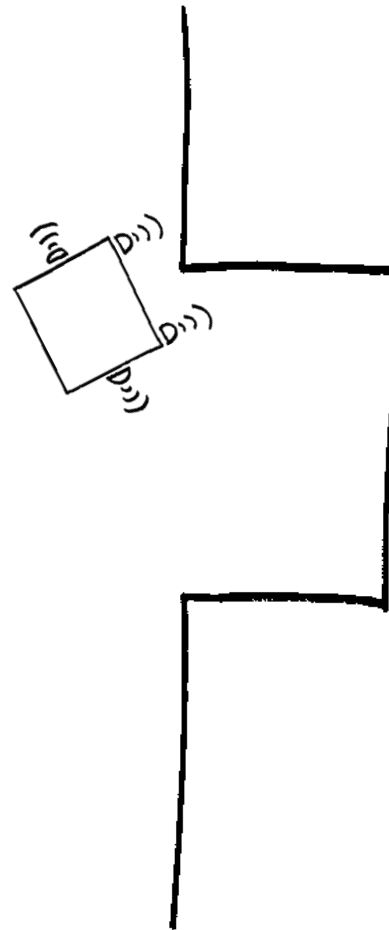
# Plan of attack: Solving a set problem.



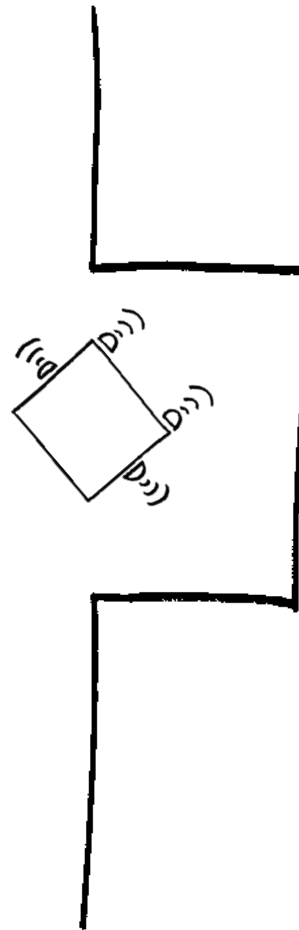
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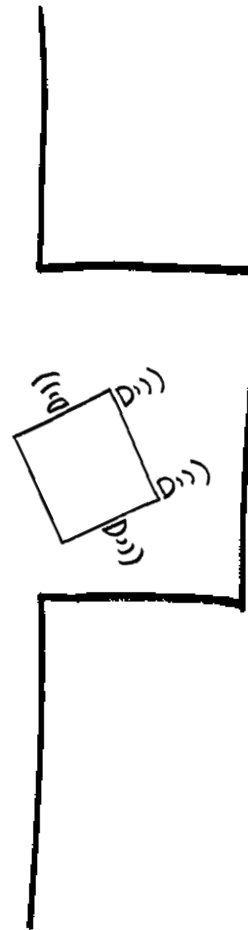


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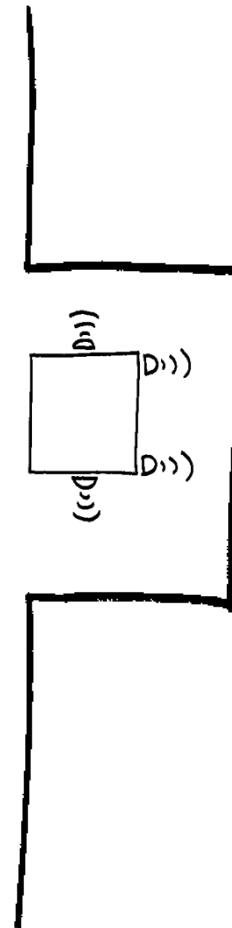




# Plan of attack: Solving a set problem.



# Plan of attack: Solving a set problem.



# Timeline

Week Of	Frank Ni	Kevin Hsiue
Nov. 12	Interfacing Sensors	Interfacing motors
Nov. 19	Sensor Modules	Motor Modules
Nov. 26	Feedback controller	Xbee Controller
Dec. 3	System Integration and Testing	
Dec. 10	Check off	