



Cake

Chris Cross and Rob Spanton



Robots Need Brains!

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ROBOTICS





Simple Rules



Stand Up



Simple Rules

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- Blue: Pass back
- Red: Pass forward
- Yellow: Pass to **your** right
- Green: Pass to **your** left





Switch off
your robots!

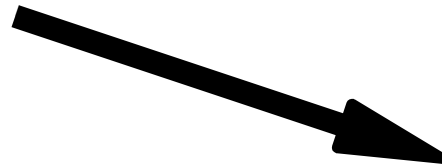
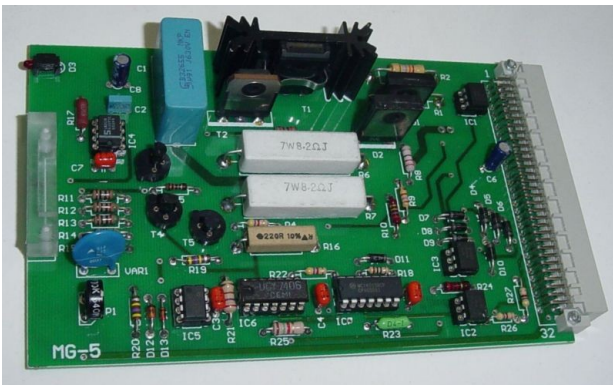




Robot Software

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How to bring your Robot to life.







Instructions

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- Set oven to gas mark 4
- Mix ingredients
- Put in tin
- Put tin in oven



Loops

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Cook in oven until baked



Conditionals

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If chocolate cake then add chocolate



Processing

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Python

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RoboIDE

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Logout Team: 1 *Unnamed team*

Forums

Switchboard

v Projects

x Switchboard

Project: badger v

New Project

Archive Project

Copy Project

Check Code

Simulate Project

Export Project

Select a date v

<< September 2009 >>						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

Selection operations:

Select None

Select All

New File

New Directory

Move (including rename)

Copy

Delete

Undelete

Delete Autosaves

Check Files' Syntax

View Log

Project badger

Ctrl+Click to Select (Cmd+Click on a Mac)
Click to Open

bee-dogs/
| new.py
new.py
robot.py



RoboIDE: Projects

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Logout Team: 1 ▾ *Unnamed team*

Forums

Switchboard

v

Projects

Project: badger ▾

New Project

Archive Project

Copy Project

Check Code

Simulate Project

Export Project

Select a date

<< September 2009 >>						
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27	28	29	30			

Selection operations:

Select None

Select All

New File
New Directory
Move (including rename)
Copy
Delete
Undelete
Delete Autosaves
Check Files' Syntax
View Log

New Project

Enter new project name:

new-project

Save

Cancel

new.py
new.py
robot.py



RoboIDE: Edit

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Logout Team: 1 *Unnamed team*

[Forums](#) [Switchboard](#)

v **Projects** x **Switchboard** x **/badger/robot.py**

Save

Check Syntax

Close

/badger/robot.py - r4

Select File Revision

```
1 from python import *
2
3 def main():
4     print "i'm a robot"
5
```

Position: Ln 1, Ch 1 Total: Ln 5, Ch 58



RoboIDE: Versioning

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Logout Team: 1 *Unnamed team*

Forums Switchboard

Projects */badger/robot.py*

Warning: File not modified!

Save Check Syntax

Commit Message:

Another helpful message to describe what you did

Please add a commit message before saving

Save

Cancel

```
1 from python import *
2
3 def main():
4     print "i'm a robot"
5
6     print "i'm still a robot"
7
8     print "I'm still a robot"
9
```



RoboIDE: History

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Logout

Team: 1 *Unnamed team*

Forums

Switchboard

v

Projects

x /badger/robot.py

x Log: /badger/robot.py

File history loaded successfully

Revert

Close

Filter by user



<<< Older

Newer >>>

Displaying 3 revision(s) between 12:31:55 19/09/2009 & 12:40:58 19/09/2009 Page 1 of 1

☐ r6 | Robert Spanton <rspanton@zepler.net> | 12:40:58 19/09/2009

Another helpful message to describe what you did

☐ r5 | Robert Spanton <rspanton@zepler.net> | 12:40:30 19/09/2009

A helpful message to describe what you did

☐ r4 | Robert Spanton <rspanton@zepler.net> | 12:31:55 19/09/2009

a helpful commit message to remind me what i just did!



Forums

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studentrobotics.org

A forum for Student Robotics participants

[Board index](#)

▼A^

[FAQ](#) [Register](#) [Login](#)

It is currently Sat Sep 19, 2009 12:32 pm

This board has no forums.

LOGIN • REGISTER

Username: Password: | Log me on automatically each visit ☐

WHO IS ONLINE

In total there is 1 user online :: 0 registered, 0 hidden and 1 guest (based on users active over the past 5 minutes)
Most users ever online was 3 on Sat Aug 15, 2009 6:38 pm

Registered users: No registered users

Legend: *Administrators*, *Global moderators*

STATISTICS

Total posts 4 • Total topics 1 • Total members 6 • Our newest member **hbuck**

[Board index](#)

[The team](#) • [Delete all board cookies](#) • All times are UTC [DST]

Powered by [phpBB](#) © 2000, 2002, 2005, 2007 phpBB Group



Documentation

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<http://www.studentrobotics.org/>

Available shortly



Loading Software

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PWM Board

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- Controls servos





JointIO Board

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- Digital inputs
- Analogue inputs
- Digital outputs



Motor Board

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- Control power to two motors
- 12V DC motors



Feedback

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- Power
- “PID Controller”
 - Absolute positioning



Vision

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Vision

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- Detect coloured blobs
 - Red, blue, green
 - Size
 - Position
- White background!
- Ignores black



Vision

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```
from sr import *

def main():
    while True:

        yield vision()

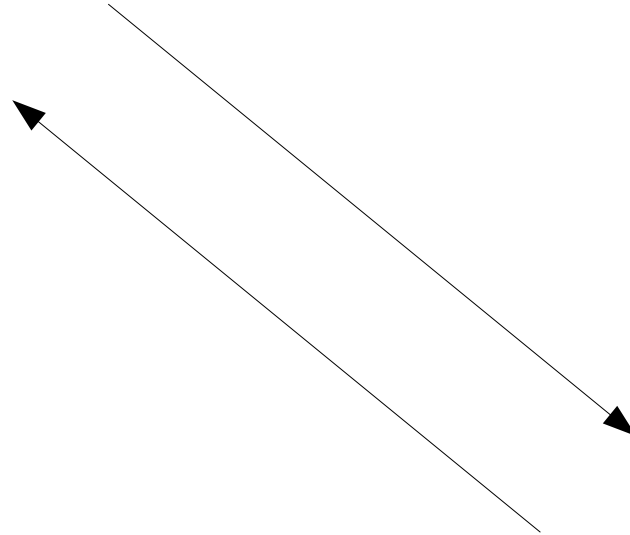
        for blob in event.vision.blobs:
            if blob.colour == RED:
                print "I saw a red token :-)"
```




Development Cycle

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Build



Test

times a million.



Debugging

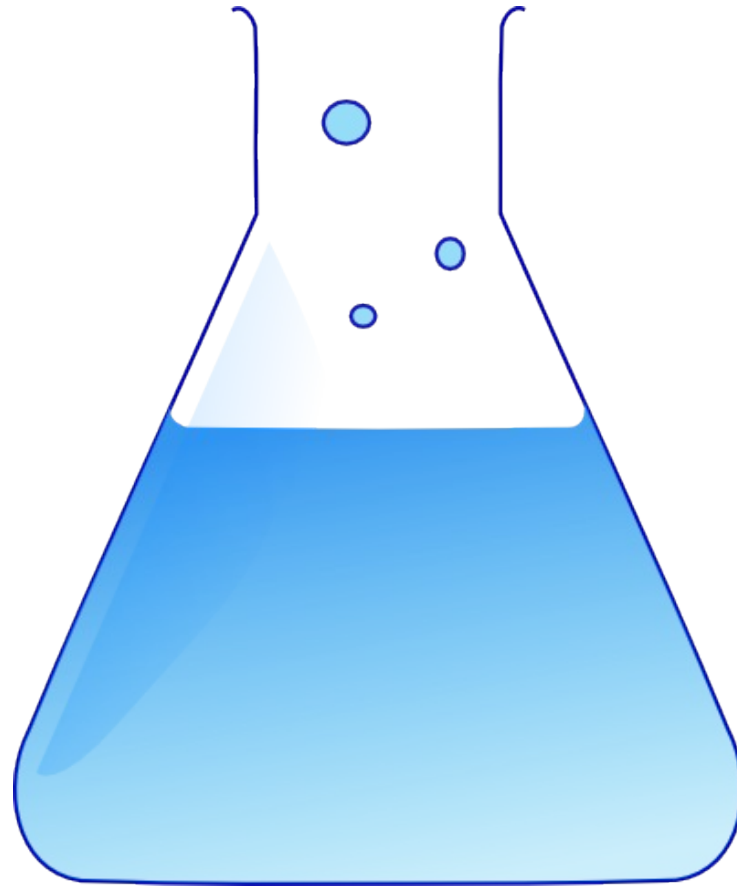
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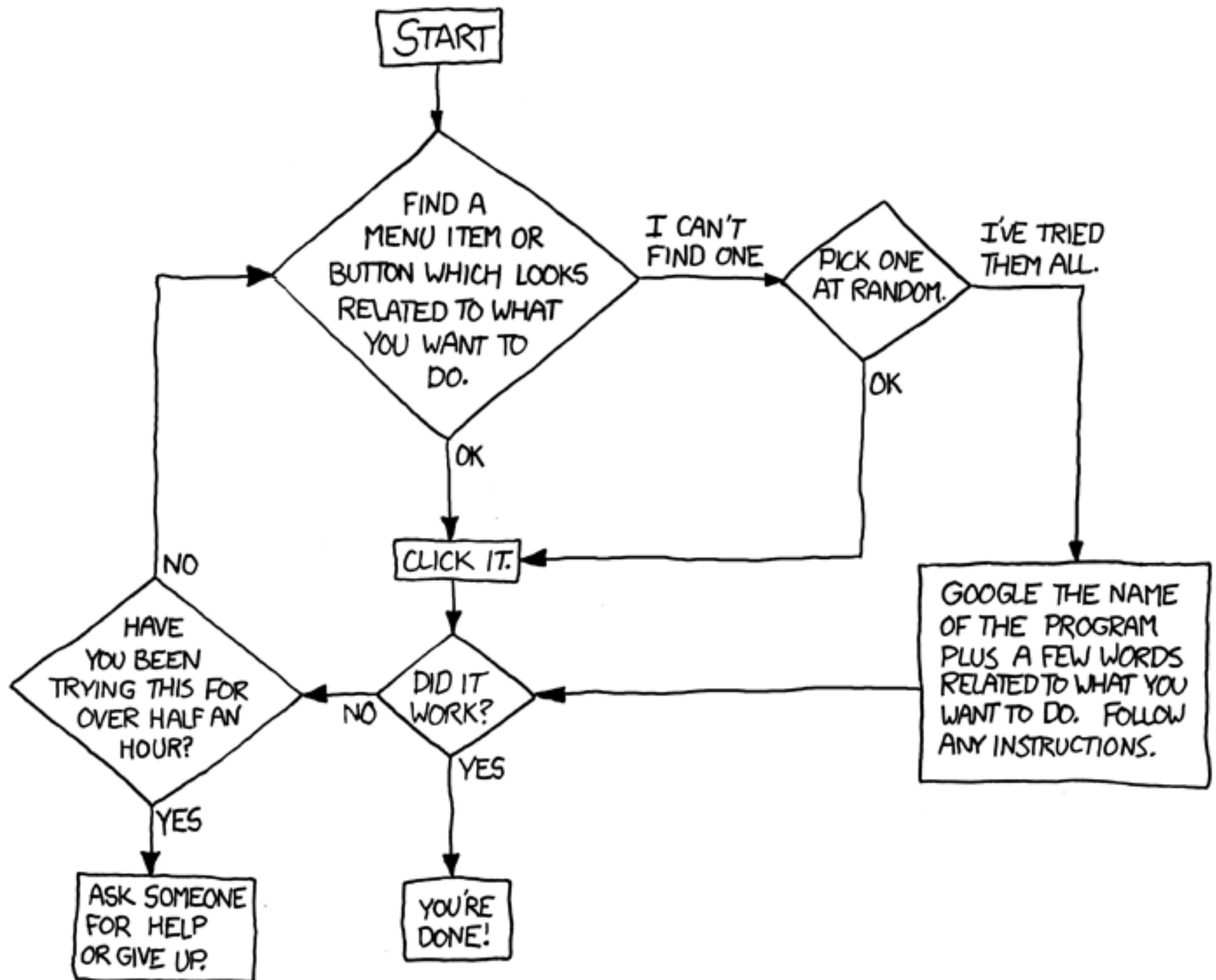
What do you do?



Experiment

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What if?





Finally

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Small Steps

