

# eVote Tutorials

by Massimo Di Pierro

## Installation and Configuration

Download web2py:

```
$ git clone https://github.com/web2py/web2py.git
$ cd web2py
$ git checkout R-2.6.4
$ cp handlers/wsgihandler.py ./
```

Remove unwanted apps

```
$ rm -r applications/examples
```

Download eVote:

```
$ git clone https://github.com/mdipierro/evote.git applications/evote
$ cd applications/evote
$ cd ../..
```

Start web2py using the built-in web server

```
$ python web2py.py
```

or start it using gunicorn

```
$ python anyserver.py -s gunicorn -i 0.0.0.0 -p 8000 -w 4
```

Configure eVote

```
$ emacs applications/init/models/0.py
DEVELOPMENT = False
DBURI        = 'sqlite://storage.sqlite'
EMAIL_SENDER = 'i.vote.secure@gmail.com'
EMAIL_SERVER = 'localhost'
EMAIL_LOGIN  = None
GMAIL_LOGIN  = None
```

```
AS_SERVICE = True
DEBUG_MODE = False
SCHEME = 'http' or 'https' # scheme for access to voting
USERS_FILENAME = None
```

To restrict access so that only some users can register and create elections change:

```
AS_SERVICE = True
USERS_FILENAME = None
```

with:

```
AS_SERVICE = False
USERS_FILENAME = "/path/to/emails.txt"
```

where "/path/to/emails.txt" is a file you must create which contains a list of emails of users who can create elections. One email per line.

Notice USERS\_FILENAME can also be a URL. In that case eVote will download the file from the URL. Notice that the list of emails is cached and only refreshed every hour.

You also need to configure the email:

```
EMAIL_SENDER = 'i.vote.secure@gmail.com'
EMAIL_SERVER = 'localhost' # any SMTP server
EMAIL_LOGIN = None # "username:password"
```

For security you may want to restrict eVote to use https:

```
SCHEME = 'https'
```

In this case you also have to configure the web server to use HTTPS. For the case of the built-in web2py server refer to the online documentation.

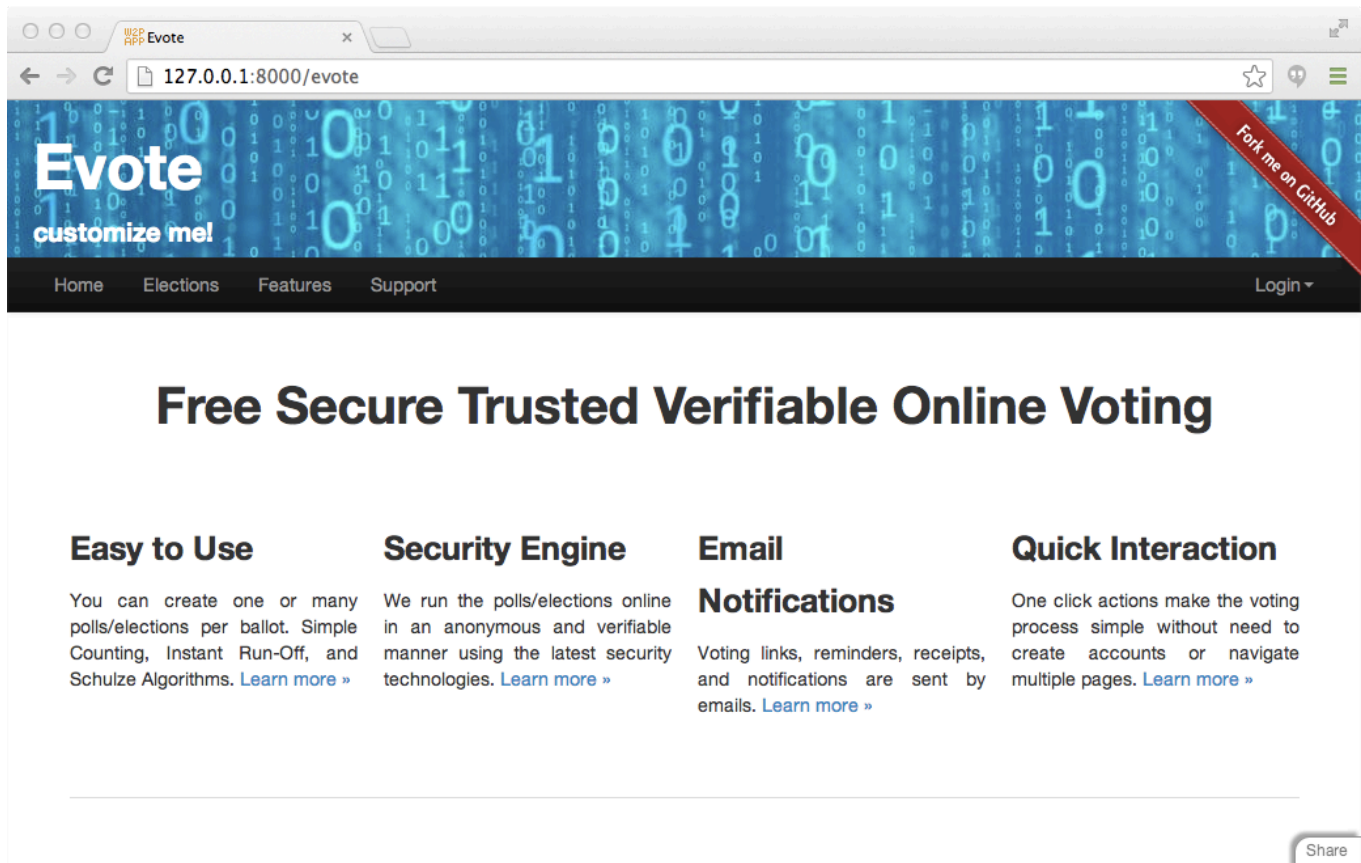
Optionally you may want to redirect (using the web server or using routes.py):

```
http://hostname:port/ to http://hostname:port/evote
```

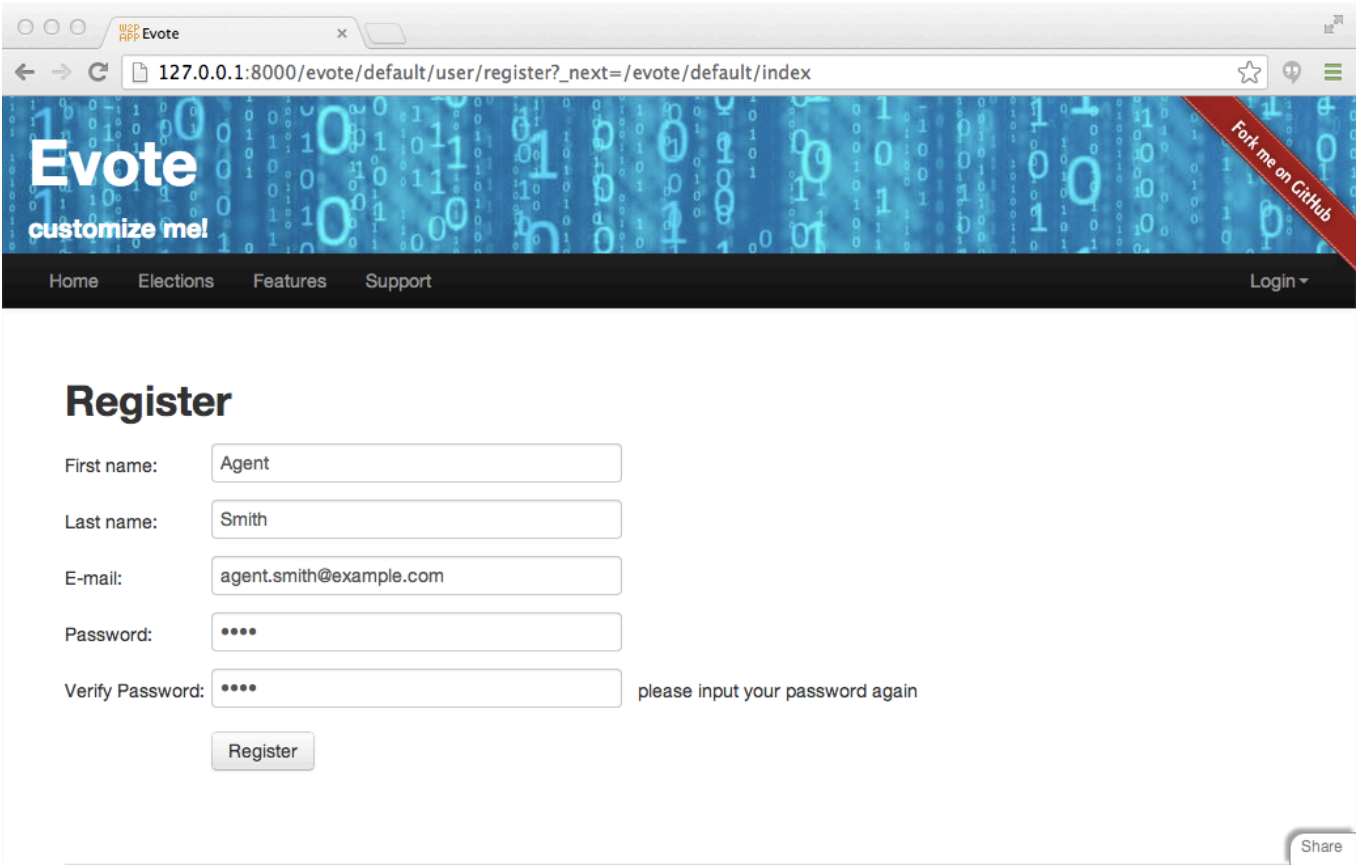
At this point eVote is configured and running.

## Running eVote

Visit the eVote URL: <http://hostname/evote>



Click on [register] and register:



The screenshot shows a web browser window with the URL `127.0.0.1:8000/evote/default/user/register?_next=/evote/default/index`. The page header features the 'Evote' logo with the tagline 'customize me!' and a navigation menu with links for 'Home', 'Elections', 'Features', and 'Support'. A 'Login' link is also present. A red banner in the top right corner reads 'Fork me on GitHub'. The main content area is titled 'Register' and contains a form with the following fields: 'First name' (filled with 'Agent'), 'Last name' (filled with 'Smith'), 'E-mail' (filled with 'agent.smith@example.com'), 'Password' (masked with four dots), and 'Verify Password' (masked with four dots). A 'Register' button is located below the password fields. A text prompt 'please input your password again' is positioned to the right of the 'Verify Password' field. A 'Share' button is located in the bottom right corner of the page.

Evote  
customize me!

Home Elections Features Support Login

## Register

First name:

Last name:

E-mail:

Password:

Verify Password:  please input your password again

Share

The newly registered user will receive an email with a link. Click on the link to verify the email. Then login.

Upon login you will see your username on the top-right: “welcome Agent”!

The screenshot shows a web browser window with the address bar displaying `127.0.0.1:8000/evote/default/index#`. The page features a blue header with a binary background. The "Evote" logo is on the left, with the tagline "customize me!". A "Logged in" notification box is centered in the header. On the right, a red banner says "Fork me on GitHub". Below the header is a navigation bar with links: Home, Elections, Features, and Support. The user's name "Welcome Agent" is displayed on the far right. The main content area has a large heading "Free Secure Trusted Verifiable Online Voting". Below this are four columns of text describing the application's features: Easy to Use, Security Engine, Email Notifications, and Quick Interaction. Each column includes a brief description and a "Learn more" link. A "Share" button is located in the bottom right corner.

Evote  
customize me!

Logged in

Fork me on GitHub

Home Elections Features Support Welcome Agent

## Free Secure Trusted Verifiable Online Voting

### Easy to Use

You can create one or many polls/elections per ballot. Simple Counting, Instant Run-Off, and Schulze Algorithms. [Learn more »](#)

### Security Engine

We run the polls/elections online in an anonymous and verifiable manner using the latest security technologies. [Learn more »](#)

### Email Notifications

Voting links, reminders, receipts, and notifications are sent by emails. [Learn more »](#)

### Quick Interaction

One click actions make the voting process simple without need to create accounts or navigate multiple pages. [Learn more »](#)

Share

Click on the [elections] menu tab to create a new election:

The screenshot shows a web browser window with the address bar displaying `127.0.0.1:8000/evote/default/elections`. The page header features the 'Evote' logo and 'My Elections' text on a blue background with binary code. A navigation bar includes links for 'Home', 'Elections', 'Features', and 'Support', along with a 'Welcome Agent' message. A red banner in the top right corner says 'Fork me on GitHub'. The main content area has the heading 'Create a new election' and a 'New Election' button. Below this, the text reads: 'My Elections', 'No elections require your vote', and 'There are no elections managed by you'. The footer contains 'Copyright © 2013' on the left and 'Powered by web2py' with a 'Share' button on the right.

Evote  
My Elections

Home Elections Features Support Welcome Agent

Create a new election

New Election

My Elections

No elections require your vote

There are no elections managed by you

Copyright © 2013 Powered by web2py Share

A new election has many parameters:

- a title
- a ballot (it contains the options and text)
- emails of voters
- emails of managers (they will receive anonymized copies of voted ballots for recount)
- a deadline
- additional text to be used in email communications
- an id (assigned automatically after creation)

The screenshot shows a web browser window with the address bar displaying `127.0.0.1:8000/evote/default/edit`. The page header features the "Evote" logo, a navigation menu with "Home", "Elections", "Features", and "Support", and a user greeting "Welcome Agent". A red banner on the right side of the header says "Fork me on GitHub".

## Create/Edit Election

Election title

### Ballot

This is the text of the ballot. {{0}} {{1}} {{2}} ..., add INPUT radio boxes. Radio boxes with the same number correspond to exclusive options.

**Election Title**

This is a sample ballot!

Ranking Election

- {{test:ranking}} Candidate A
- {{test:ranking}} Candidate B
- {{test:ranking}} Candidate C

Share

Scroll down for more options...

W2P  
HPP

Evote

127.0.0.1:8000/evote/default/edit

Voters

List of emails of voters.

agent.smith@example.com

other.voter1@example.com

other.voter2@example.com

other.voter3@example.com

Deadline

Results will be public after the deadline (UTC/GMT time)

Save and Preview

Managers

List of emails of election managers

agent.smith@example.com

other.manager@example.com

more options

Share



Click [more options] for yet more option.

W2P  
RPP

Evote

127.0.0.1:8000/evote/default/edit

☆🔍☰

more options

Deadline

Results will be public after the deadline (UTC/GMT time)

Text of email with voting link

{{=title}}

Link to vote: {{=link}}

Link to ballots: {{=link\_ballots}}

Link to results: {{=link\_results}}

Text of email for voting receipt

{{=title}}

You have voted and your vote has been registered. Thank you!

Here is your ballot.

Share

Types of elections.

A ballot can contain many groups of radio boxes. Each group has a name.

The simplest way to create a group is:

{{x}} First Candidate {{x}} Second Candidate {{x}} Third Candidate

The repeated {{x}} will be rendered as three radio boxes. “x” is the name of this group. The name can be any alphanumeric sequence. If the name is followed by a “!”, that is interpreted as a pre-selected default option.

{{x!}} First Candidate {{x}} Second Candidate {{x}} Third Candidate

You can create multiple groups using for example:

First Candidate {{x}} yes {{x}} no  
Second Candidate {{y}} yes {{y}} no  
Third Candidate {{z}} yes {{z}} no

For each (‘x’, ‘y’, ‘z’) evote will count the first selection (yes) and the second selection (no).

eVote also allows ranking (using different schemes). This is experimental. In this case you make an unordered list:

- {{x:ranking}} First Candidate
- {{x:ranking}} Second Candidate
- {{x:ranking}} Third Candidate

Here “x” is the election name, “ranking” is a keyword which instructs evote to turn the list item into a sortable list. The voter can sort the list with the mouse.

Once the election has been created, you click [submit] and you will see a sample ballot page.

W2P  
HPP

Evote

jhonjairoroa87's blog: jQu

127.0.0.1:8000/evote/default/start/1#

Email Voters and Start Election Now!Back to Edit

Test Ballot (not actual voting ballot)

Election Title

This is a sample ballot!

Ranking Election

|   |             |
|---|-------------|
| 1 | Candidate A |
| 2 | Candidate B |
| 3 | Candidate C |

Candidate 1  
Candidate 2  
Candidate 3

or

Candidate 1  
Candidate 2  
Candidate 3

Submit You Ballot!

Share

If you like it press [Email Voters and Start Election Now] else go back end edit it.

You can always manage all your elections in one place:

W2P  
HPP

Evote

x

jhonjairoa87's blog: jQuery

x

127.0.0.1:8000/evote/default/elections

Create a new election

New Election

My Elections

Elections requiring your vote

Election title (1)

Vote

Elections managed by you

Election title open

Action

Start Election

Send Reminder

Close Election

Ballots

Results

CSV Voters

Edit Election

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owered by web2py

Share

For each election click on [ballots] to see the empty ballots which have need created. BLANK means the ballot does not contain a vote yet.

WEP  
RFP

Evote

x

jhonjairoa87's blog: jQuery

x

127.0.0.1:8000/evote/default/ballots/1

# Ballots for election #1 "Election title"

Ballots are generated when the election starts and ballot-ids are assigned to voters when their vote is cast. The enumerated collection of ballots will not change unless the election has been tampered with. The ballot UUID is comprised of an actual UUID and an RSA signature of the UUID using the election private\_key.

Total Ballots/Voters: 4

Used Ballots/Votes: 0

| Ballot Id       | Voted On (UTC/GMT) |
|-----------------|--------------------|
| ballot-1-000001 | BLANK              |
| ballot-1-000002 | BLANK              |
| ballot-1-000003 | BLANK              |
| ballot-1-000004 | BLANK              |

Download Ballots

Copyright © 2019

Revised by jhonjairoa87

Share

When you start the election, each voter receives an email like this:

From: i.vote.secure@gmail.com  
To: other.voter1@example.com  
Subject: Election title [1]

Election N.1 by agent.smith@example.com

Election title

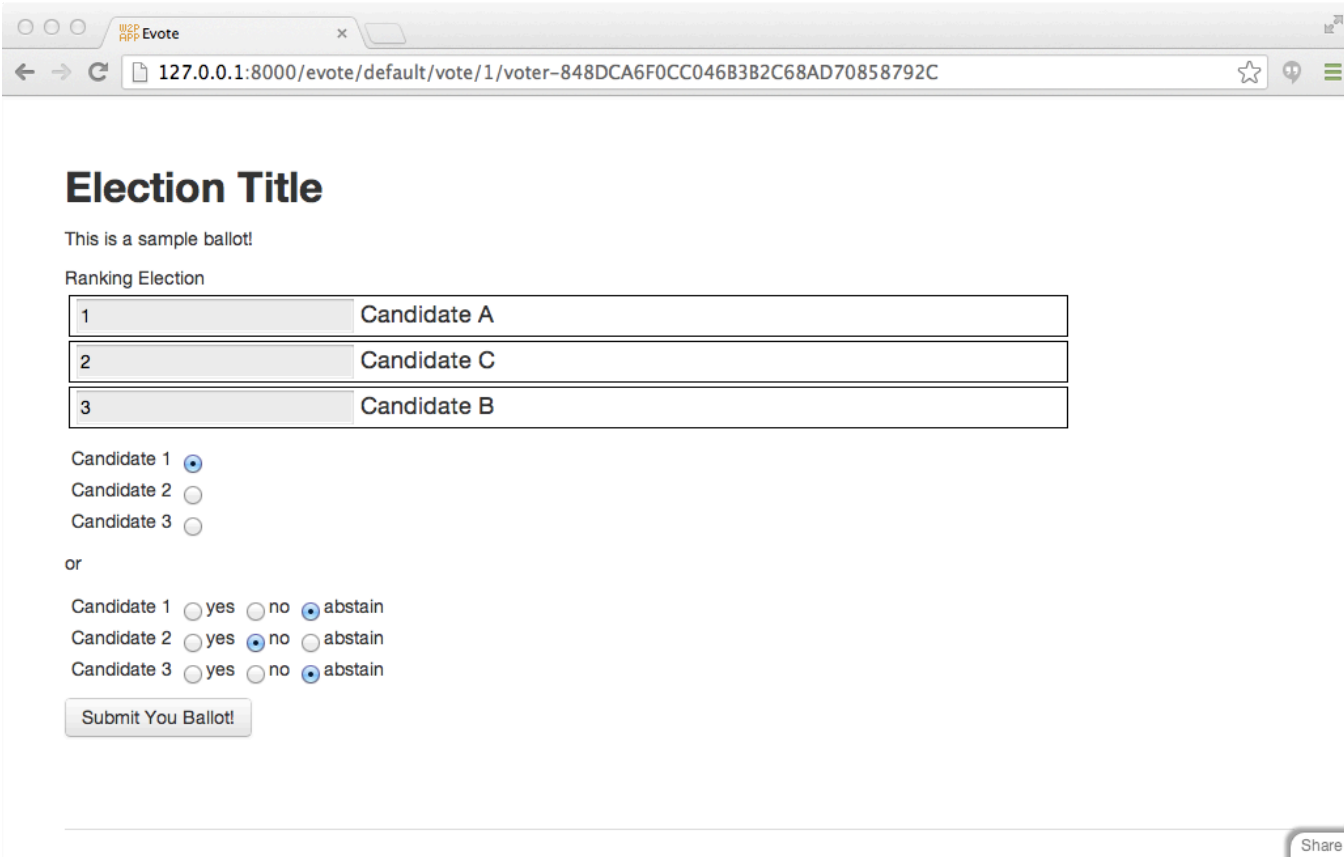
Link to vote: <http://127.0.0.1:8000/evote/default/vote/1/voter-848DCA6F0...>

Link to ballots: <http://127.0.0.1:8000/evote/default/ballots/1>

Link to results: <http://127.0.0.1:8000/evote/default/results/1>

The voter only needs to click on the link to vote. Upon clicking a random BLANK ballot is presented to the voter.

**ATTENTION! The system assumes the voter does receive the email!**



The screenshot shows a web browser window with the address bar displaying `127.0.0.1:8000/evote/default/vote/1/voter-848DCA6F0CC046B3B2C68AD70858792C`. The page title is "Election Title". Below the title, it says "This is a sample ballot!". The main section is titled "Ranking Election" and contains a table with three rows:

|   |             |
|---|-------------|
| 1 | Candidate A |
| 2 | Candidate C |
| 3 | Candidate B |

Below the table, there are three radio buttons for "Candidate 1", "Candidate 2", and "Candidate 3". The "Candidate 1" radio button is selected. Below this, there is a section labeled "or" followed by three rows of radio buttons for "Candidate 1", "Candidate 2", and "Candidate 3". Each row has three options: "yes", "no", and "abstain". The "abstain" option is selected for all three candidates. At the bottom left, there is a button labeled "Submit Your Ballot!". At the bottom right, there is a "Share" button.

Upon voting the vote is recorded (linked to the ballot, not to the voter, thus anonymous) and the voter is presented with an acknowledgement pagen. The same content is also emailed to the voter as receipt and a copy is sent to the managers (anonymized) for verification.

Evote

127.0.0.1:8000/evote/default/ballot/ballot-1-000004/signature-6B628E83F2B54E63A1548138692D26AC57534E05...

# Election Title

This is a sample ballot!

Ranking Election

1

Candidate A

3

Candidate B

2

Candidate C

Candidate 1

Candidate 2

Candidate 3

or

Candidate 1

yes

no

abstain

Candidate 2

yes

no

abstain

Candidate 3

yes

no

abstain

ballot-1-000004

signature-6B628E83F2B54E63A1548138692D26AC57534E05E822424D980EA12B792F6FBDDC74520A70FC2666F6277C9A041468002B9180AD5076F0790B3B93532C517F93FFC2207C32A624E979BFC2F26F293CB1D2EB5C72F1DCD02E00751B218FD42D46B85C99061425F996D114B81262F3405DC81AF94E4E5467BE57FB9CCF4649F861

The signature is an RSA digital signature generated from the ballot content and the election private\_key

Election Results

Ballots

Ballot Verification Code

Share

When a vote is cast, it is shown in the ballots page. This page is public to show that no new ballots are added or deleted. The actual ballots only become public when the election is closed.

WEP  
RFP

Evote

x

← → ↺

127.0.0.1:8000/evote/default/ballots/1

☆

💬

☰

Home

Elections

Features

Support

Welcome Agent ▾

## Ballots for election #1 "Election title"

Ballots are generated when the election starts and ballot-ids are assigned to voters when their vote is cast. The enumerated collection of ballots will not change unless the election has been tampered with. The ballot UUID is comprised of an actual UUID and an RSA signature of the UUID using the election private\_key.

Total Ballots/Voters: 4

Used Ballots/Votes: 1

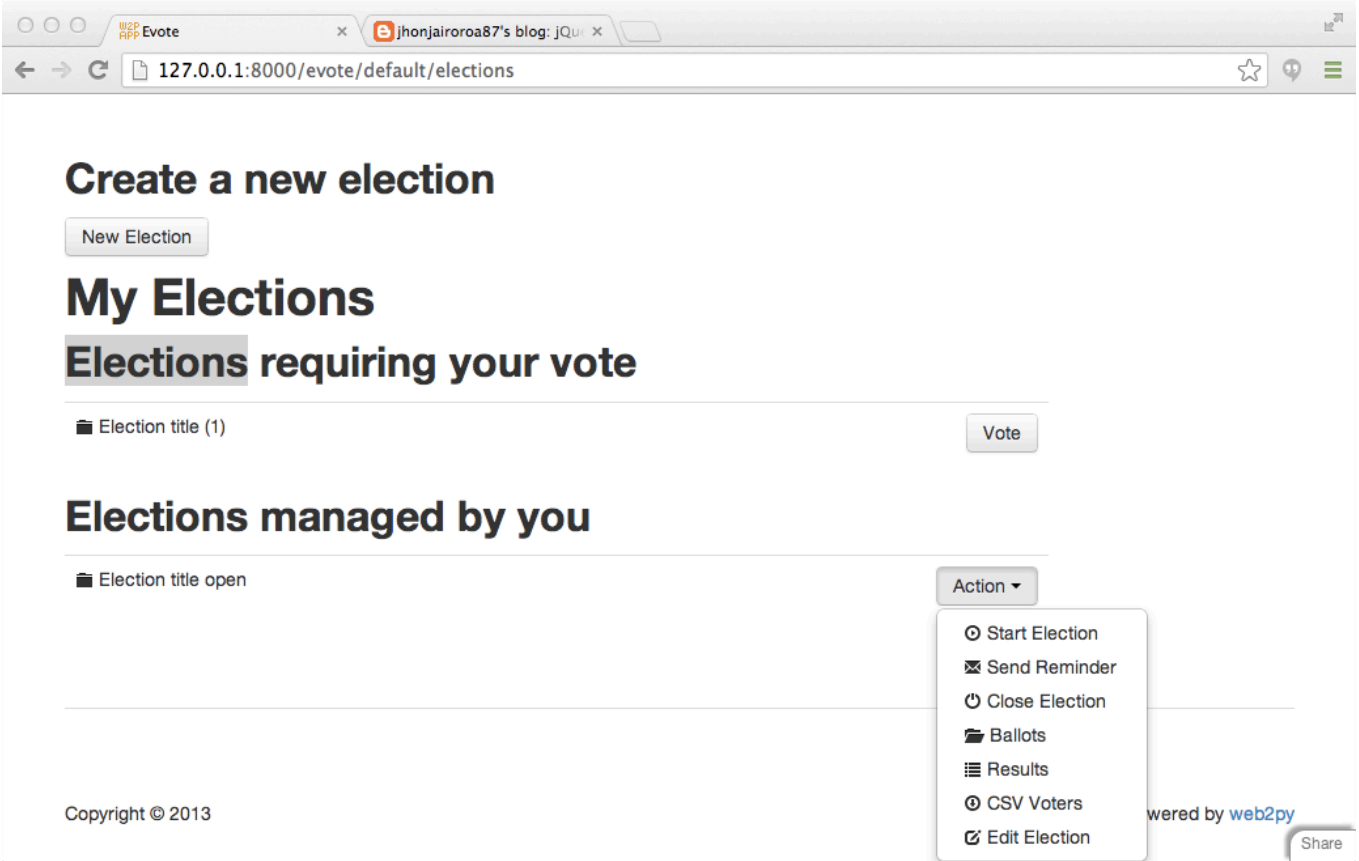
| Ballot Id                  | Voted On (UTC/GMT)  |
|----------------------------|---------------------|
| <div>ballot-1-000001</div> | BLANK               |
| <div>ballot-1-000002</div> | BLANK               |
| <div>ballot-1-000003</div> | BLANK               |
| <div>ballot-1-000004</div> | 2013-09-22 22:24:12 |

Download Ballots

Share



The manager can use the election page to prematurely close an election or send additional reminders to voters:



When an election is closed the radio boxes in each group are counted and results are shown publicly as follows:

The screenshot shows a web browser window with the address bar displaying `127.0.0.1:8000/evote/default/results/1#`. The page title is "Election Title". Below the title, it says "This is a sample ballot!". The section is titled "Ranking Election". There are three candidates listed with their respective counts in boxes:

| Candidate   | M | I | S |
|-------------|---|---|---|
| Candidate A | 9 | 1 | 2 |
| Candidate B | 1 | 1 | 0 |
| Candidate C | 3 | 1 | 1 |

Below this, there are three rows for "Candidate 1", "Candidate 2", and "Candidate 3", each with a box containing a number (2, 1, and 0 respectively). Below these, there is a section labeled "or" followed by three rows for "Candidate 1", "Candidate 2", and "Candidate 3". Each row has three boxes for "yes", "no", and "abstain" with counts inside (e.g., Candidate 1: yes=1, no=1, abstain=1).

At the bottom, a message states: "Election is completed re-counted every time this page is visited. You can see the individual ballots which have been counted and their associated tokens here". There is a "Share" button in the bottom right corner.

The boxes replace the radio boxes and show counts of clicks.

For ranking elections the boxes show different types of ranking results labeled as M, I, and S.

- M stands for "Simple Majority using the exponential Borda algorithm" (higher is better)
- I stands for "Instant Run-Off" (higher is better)
- S stands for "Schultze" (higher is better)

In the example Candidate A won according to two of the three counting algorithms.

The details of the ranking algorithms with tests are here:

[https://github.com/mdipierro/evote/blob/master/modules/ranking\\_algorithms.py](https://github.com/mdipierro/evote/blob/master/modules/ranking_algorithms.py)

Yet this part of eVote is to be considered experimental.