eVote Tutorial

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

```
$ pyhton 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 SMPT 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.

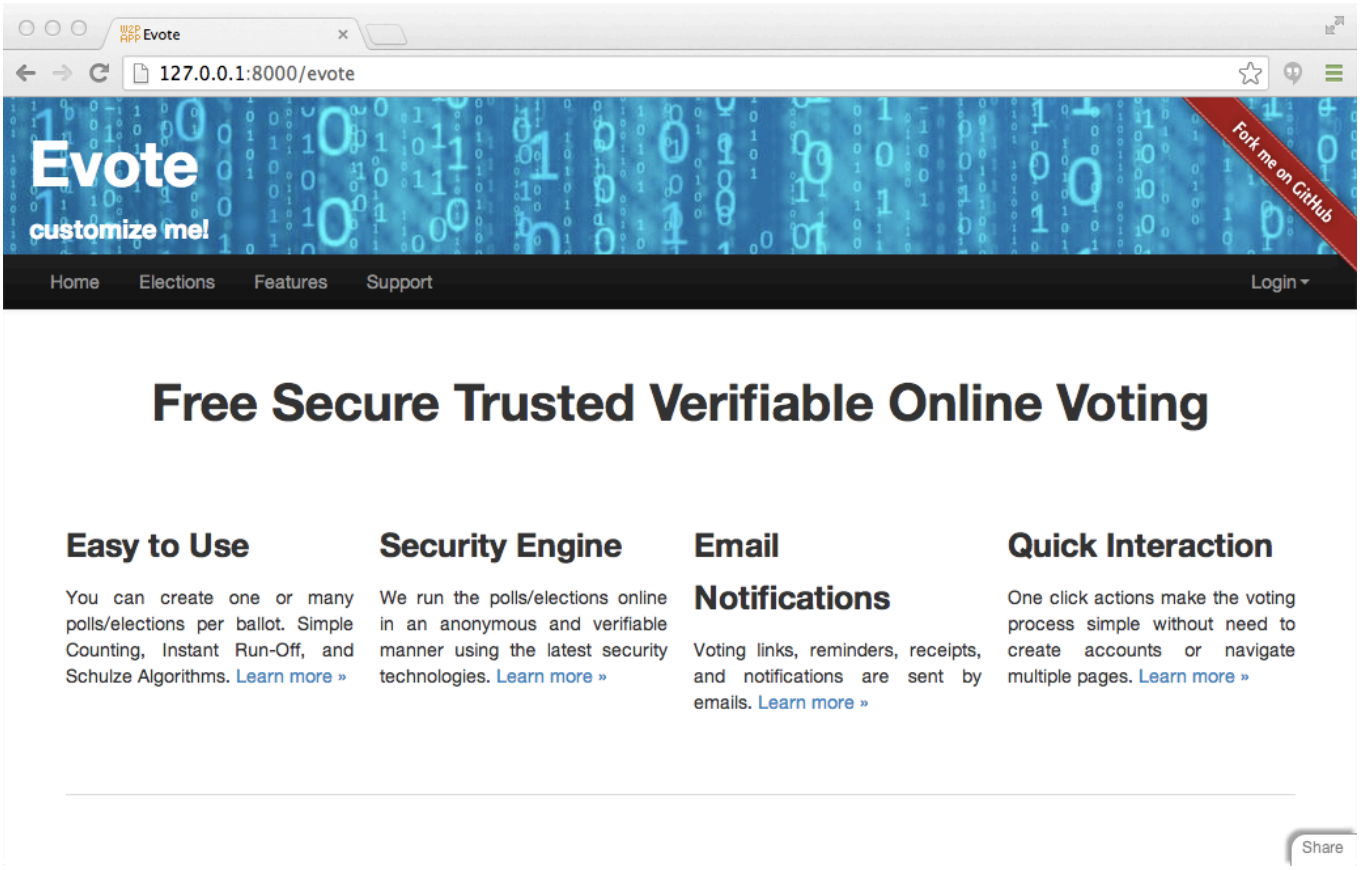
Optionally you may want to redirect (using the web server or using routes.py):

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

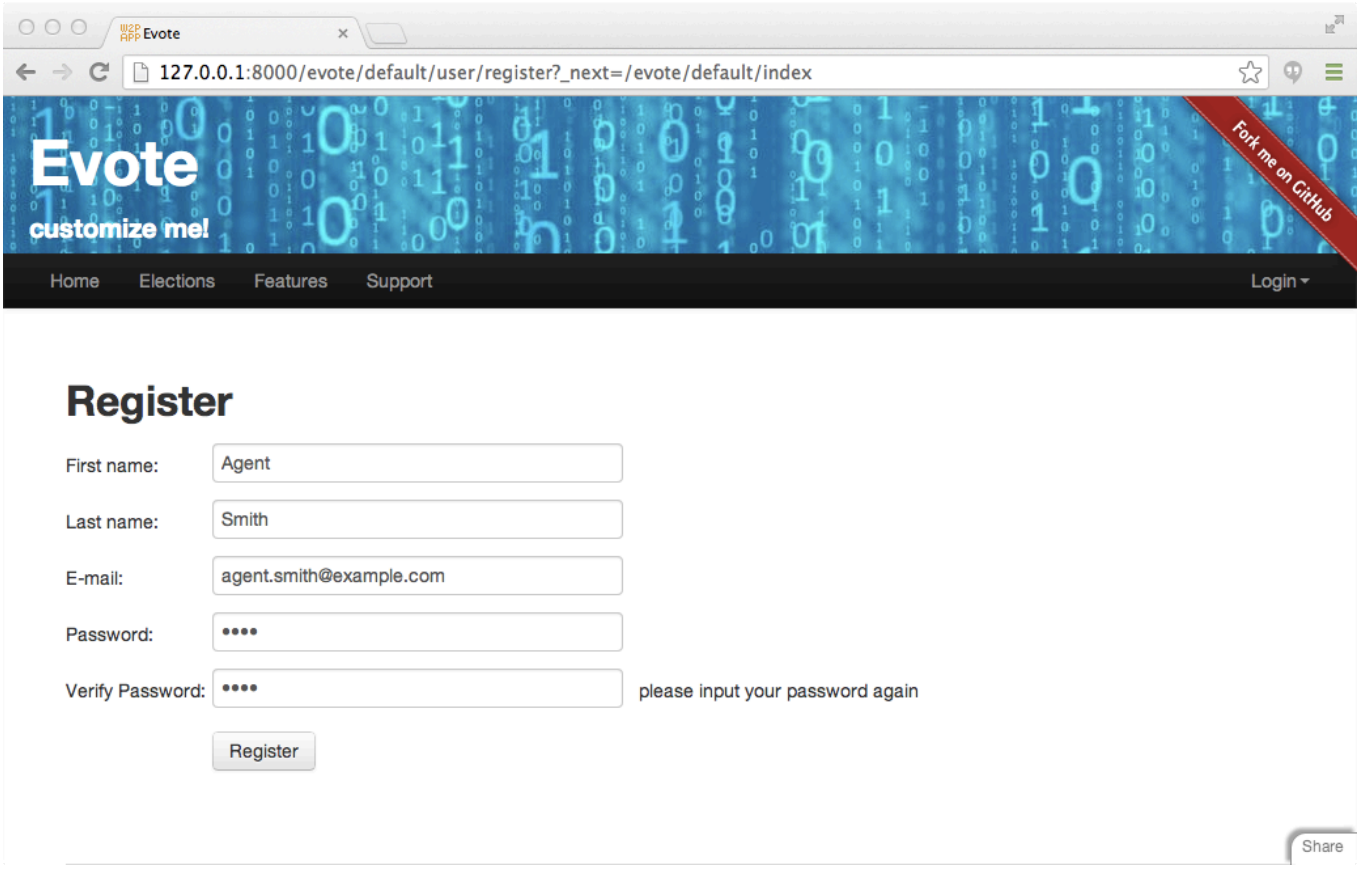
At this point eVote is configure and running.

Running eVote

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

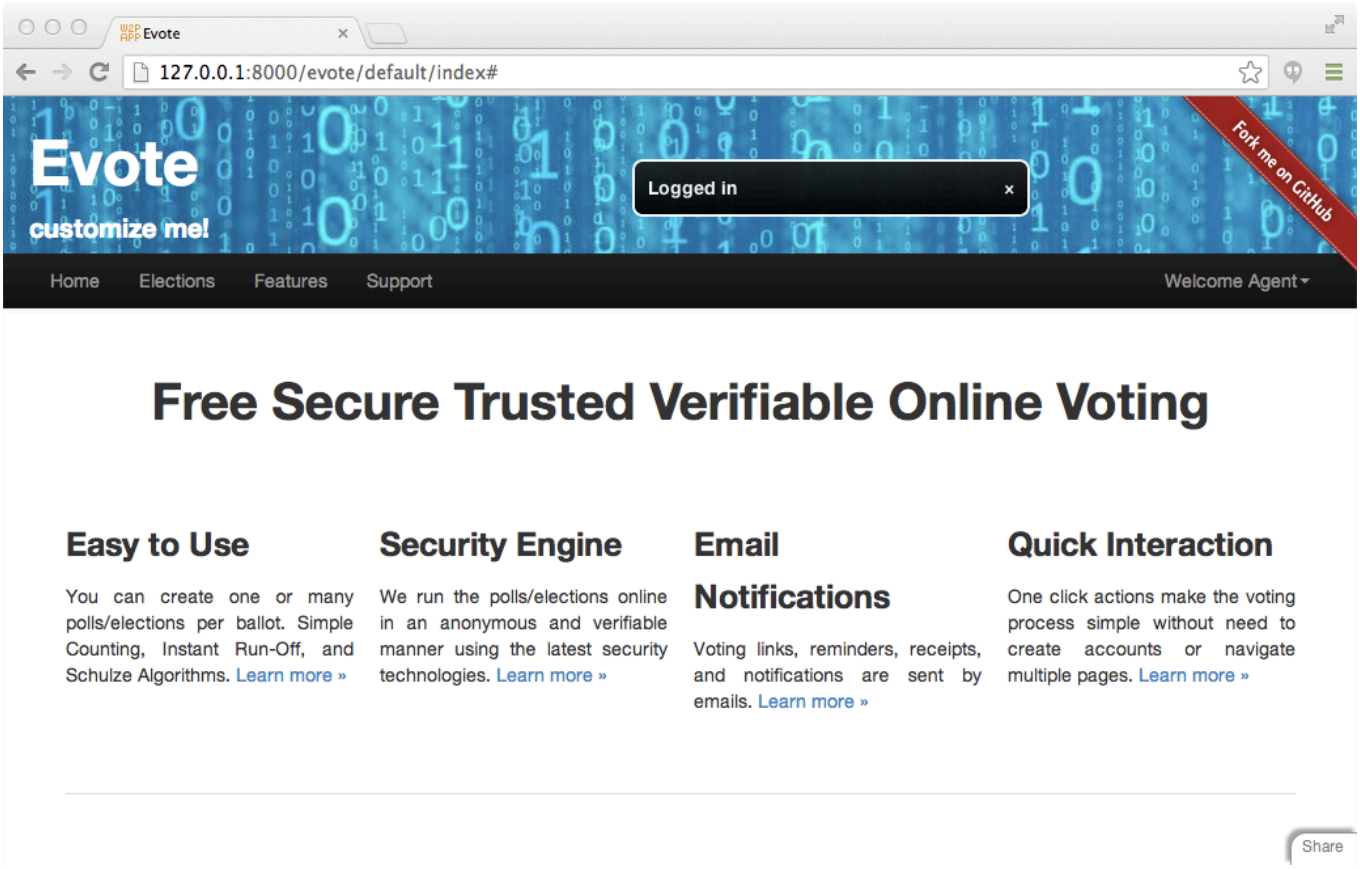


Click on [register] and register:

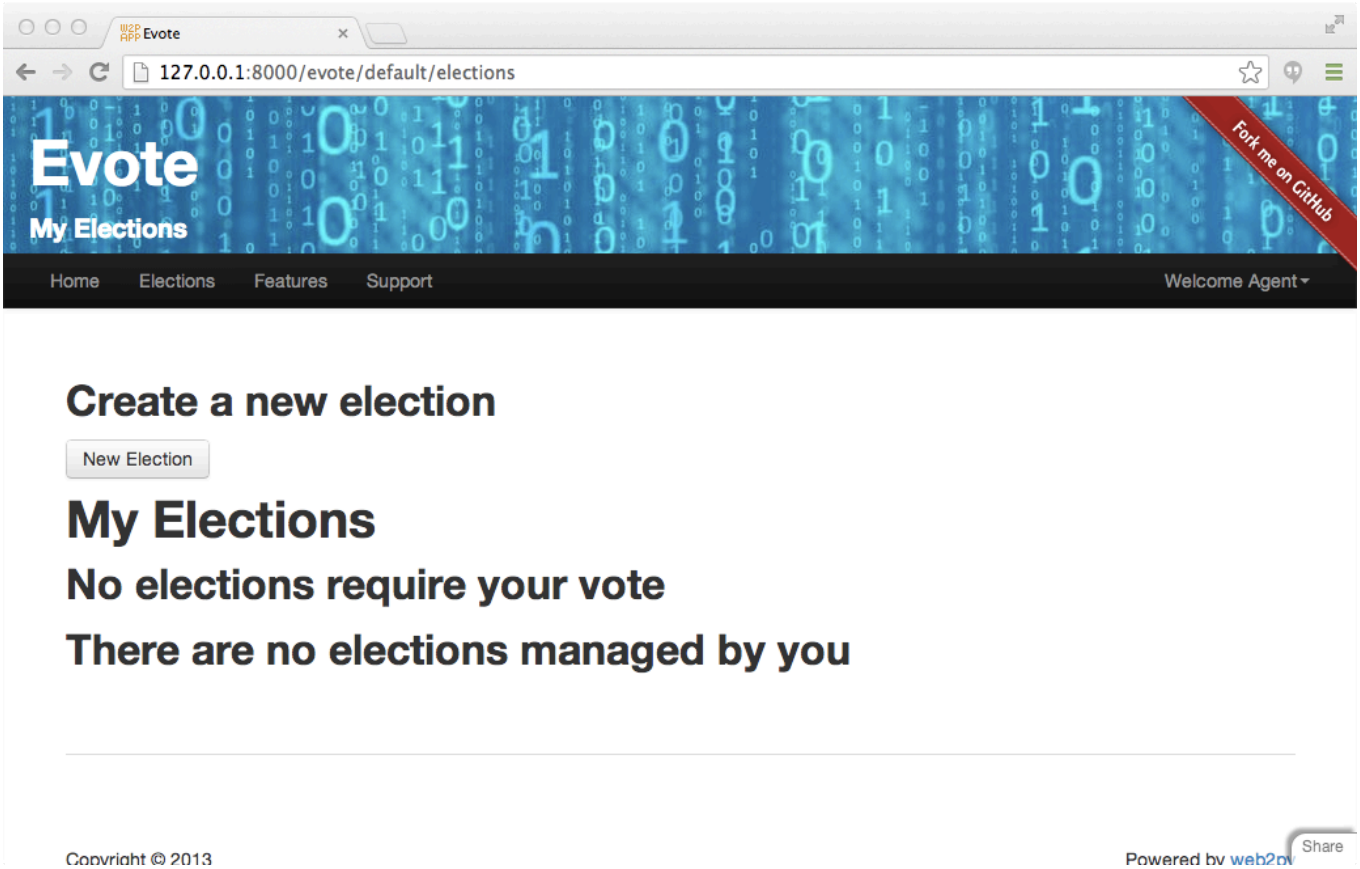


The newly registered user will receive an email with a link. Click on the link to verify the email. Then login.

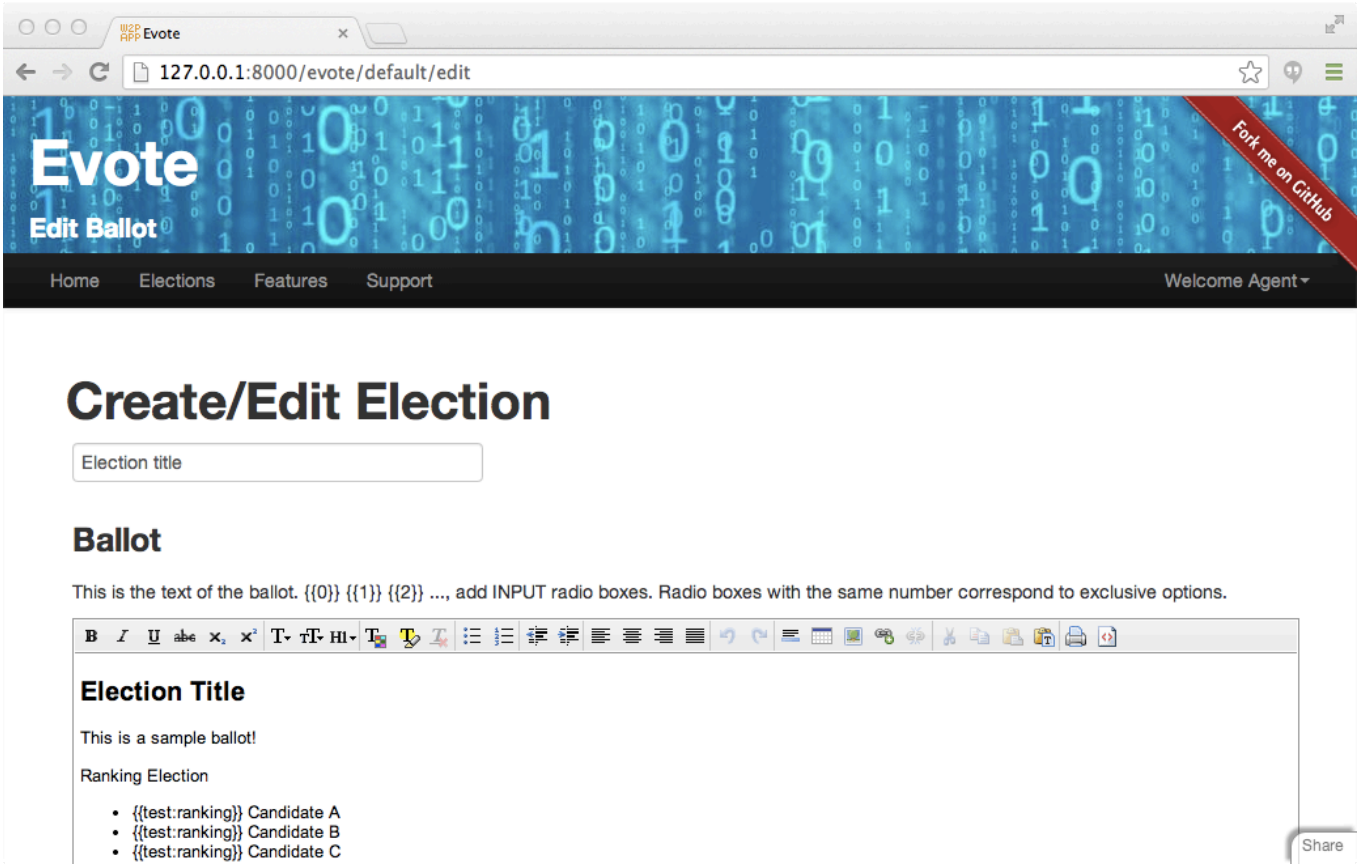
Upon login you will see your username on the top-right: “welcome Agent”!



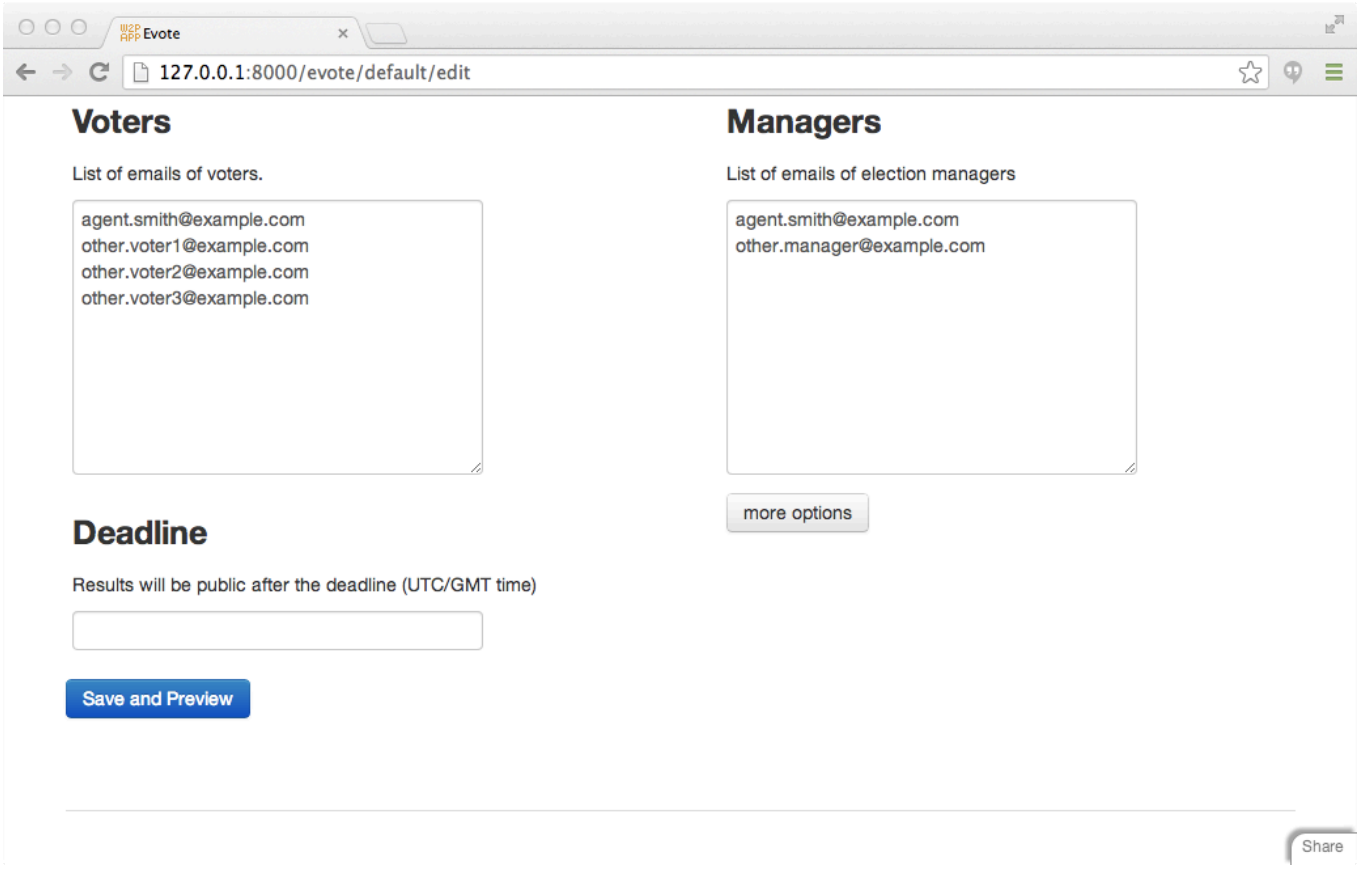
Click on the [elections] menu tab to create a new election:



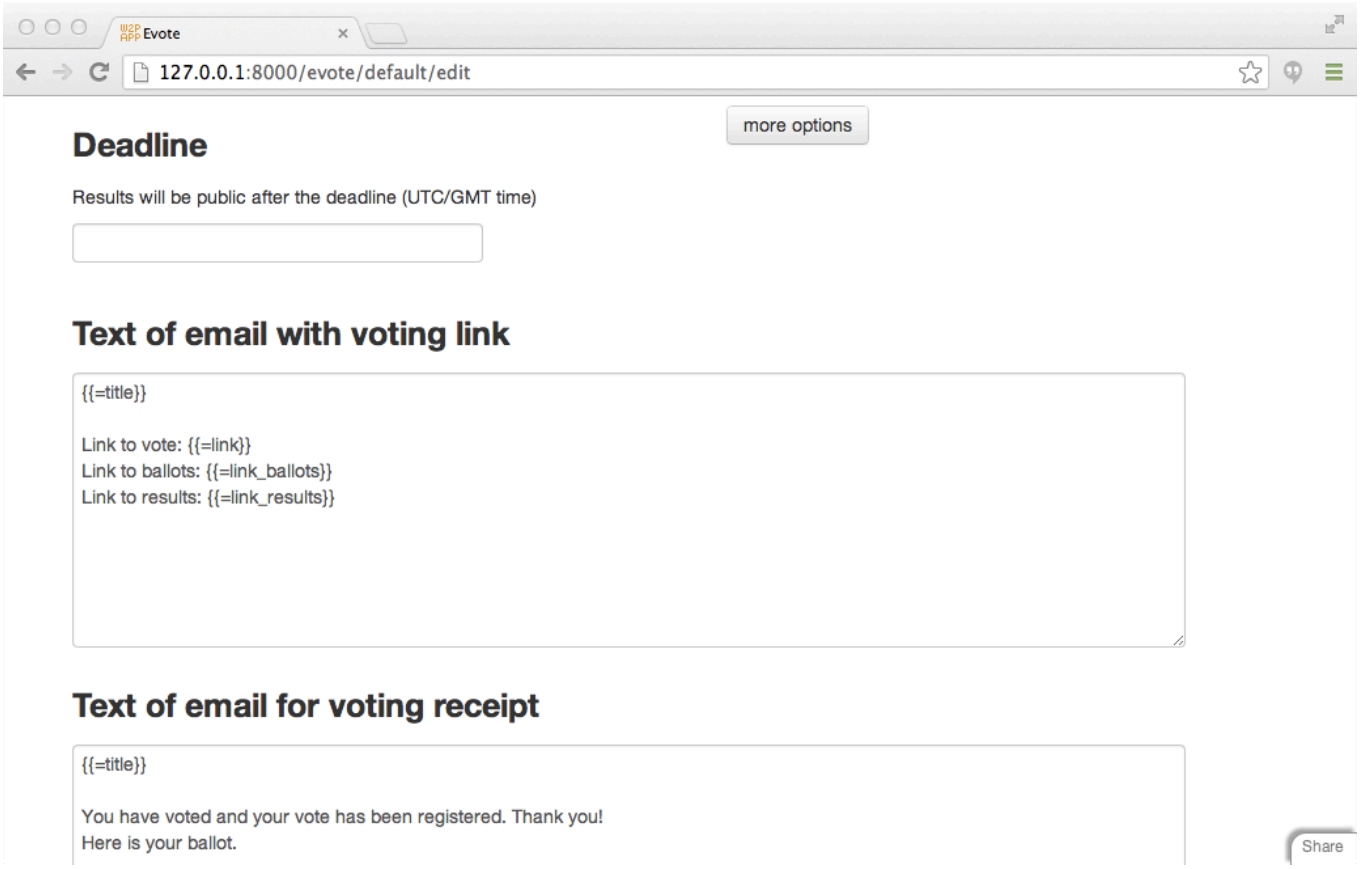
A new election has many parameters:
- a title
- a ballot (it contains the options and text)
- emails of voters
- emails of managers (they will receive anonymized copies of voted ballots for recount)
- a deadline
- additional text to be used in email communications
- an id (assigned automatically after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



Scroll down for more options...



Click [more options] for yet more option.



Types of elections.

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

The simplest way to create a group is:

{{x}} First Candiate {{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 Candiate {{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

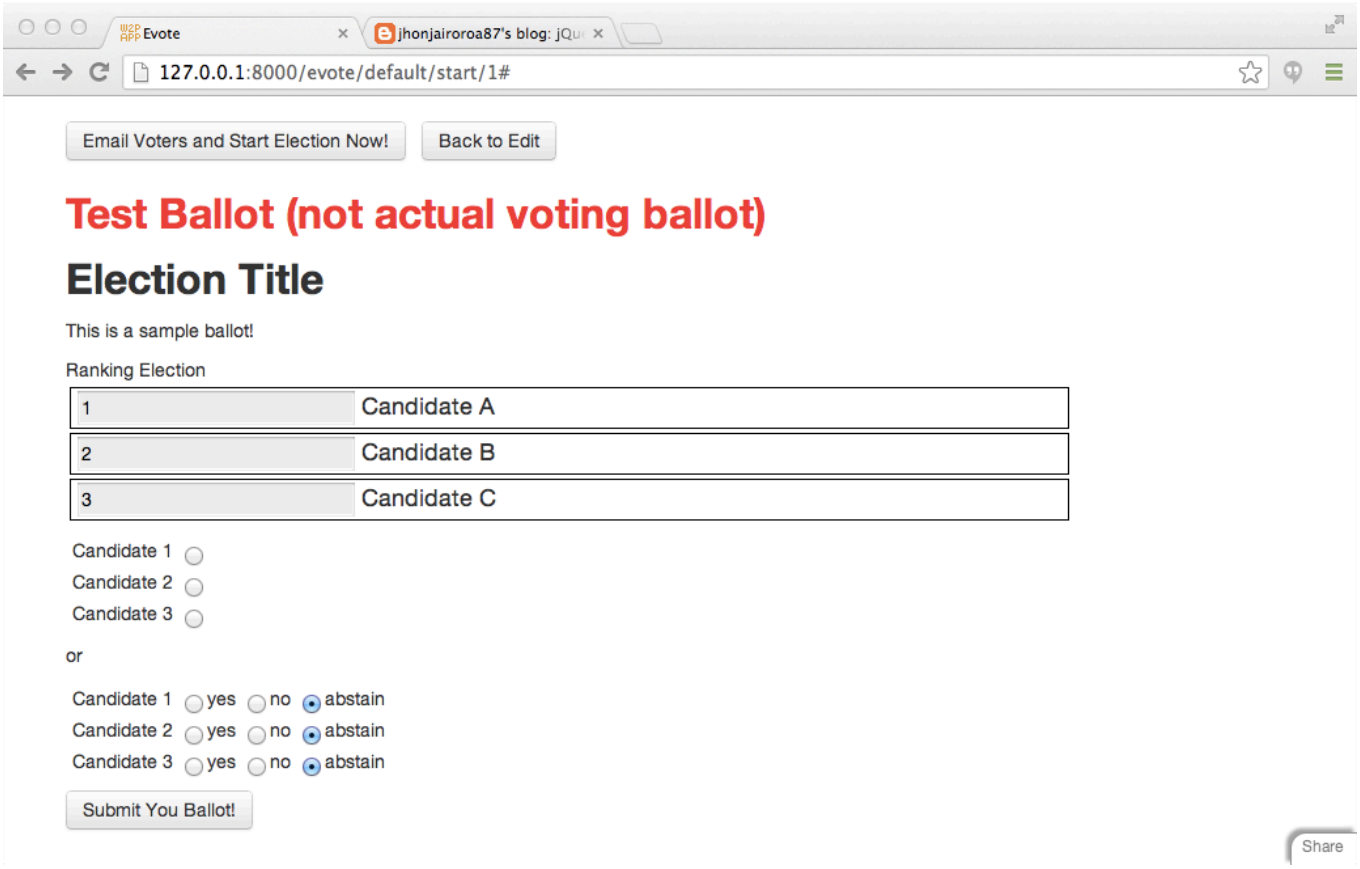
For each (‘x’,’y’,’z’) evote will count the first selection (yes) and the second selection (no).

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

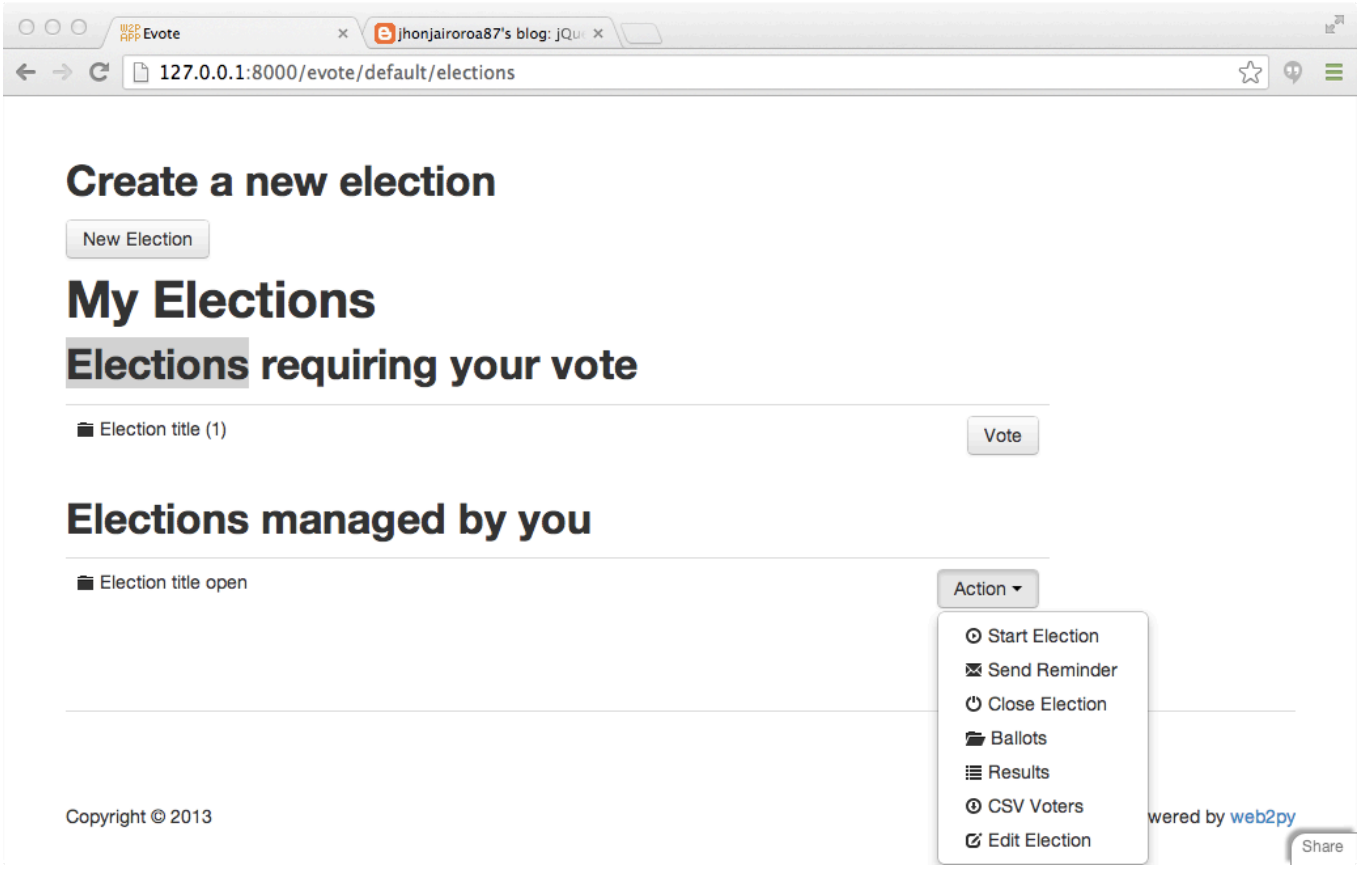
Here “x” is the election name, “ranking” is a keyword which instructs evote to turn the list item into a sortable list. The voter can sort the list with the mouse.

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

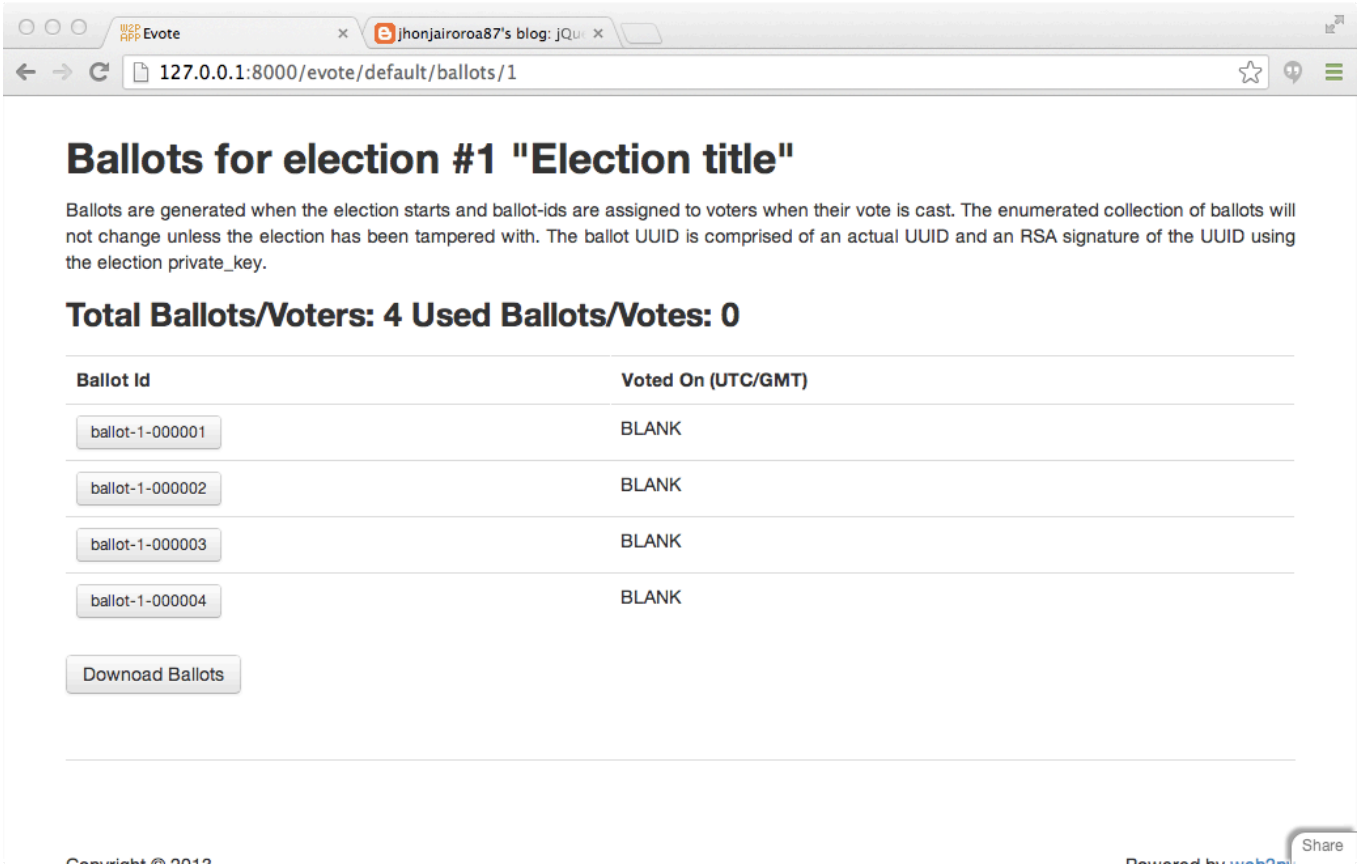


If you like it press [Email Voters and Start Election Now] else go back end edit it.

You can always manage all your elections in one place:



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.

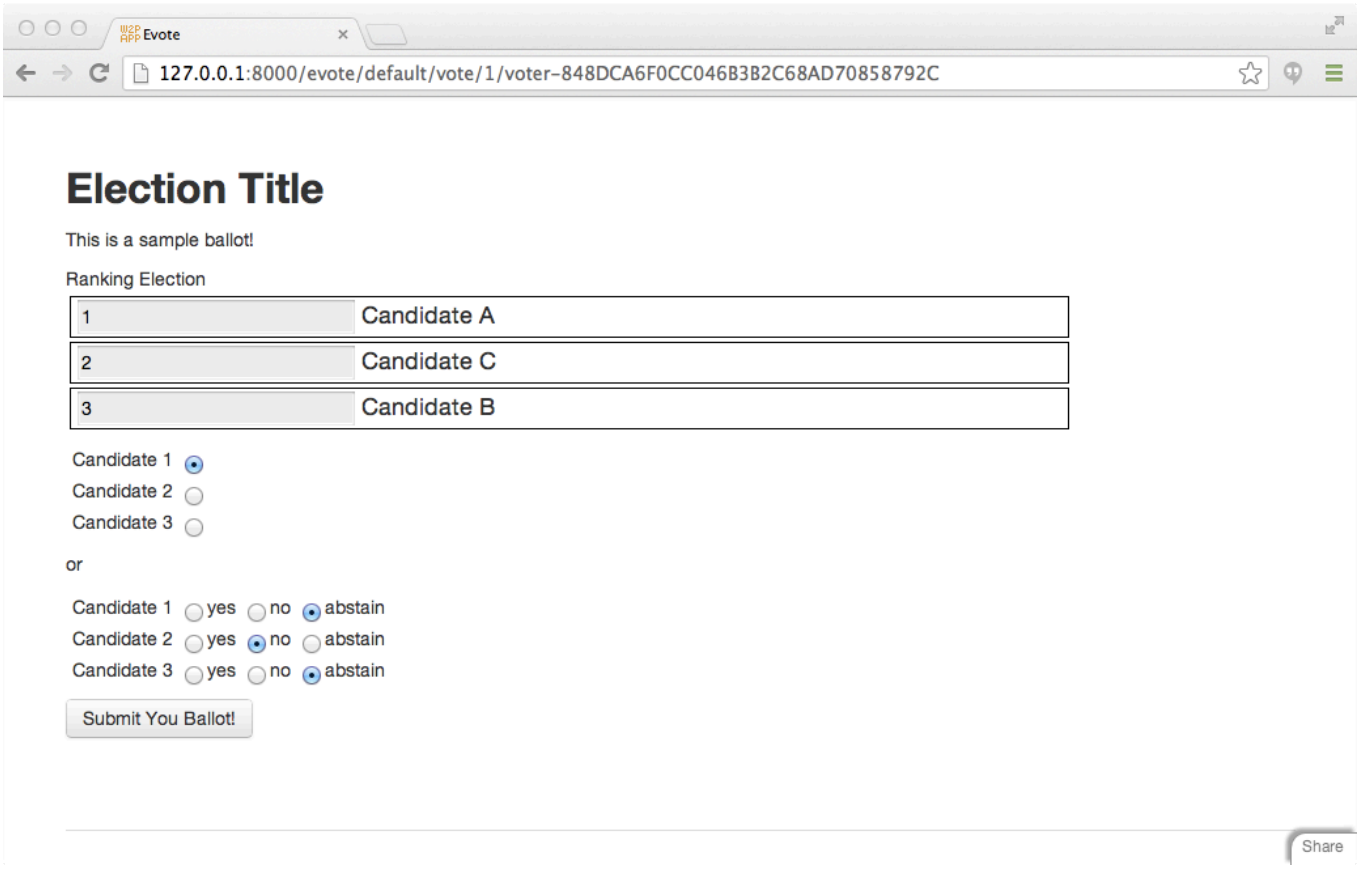


When you start the election, each voter receives an email like this:

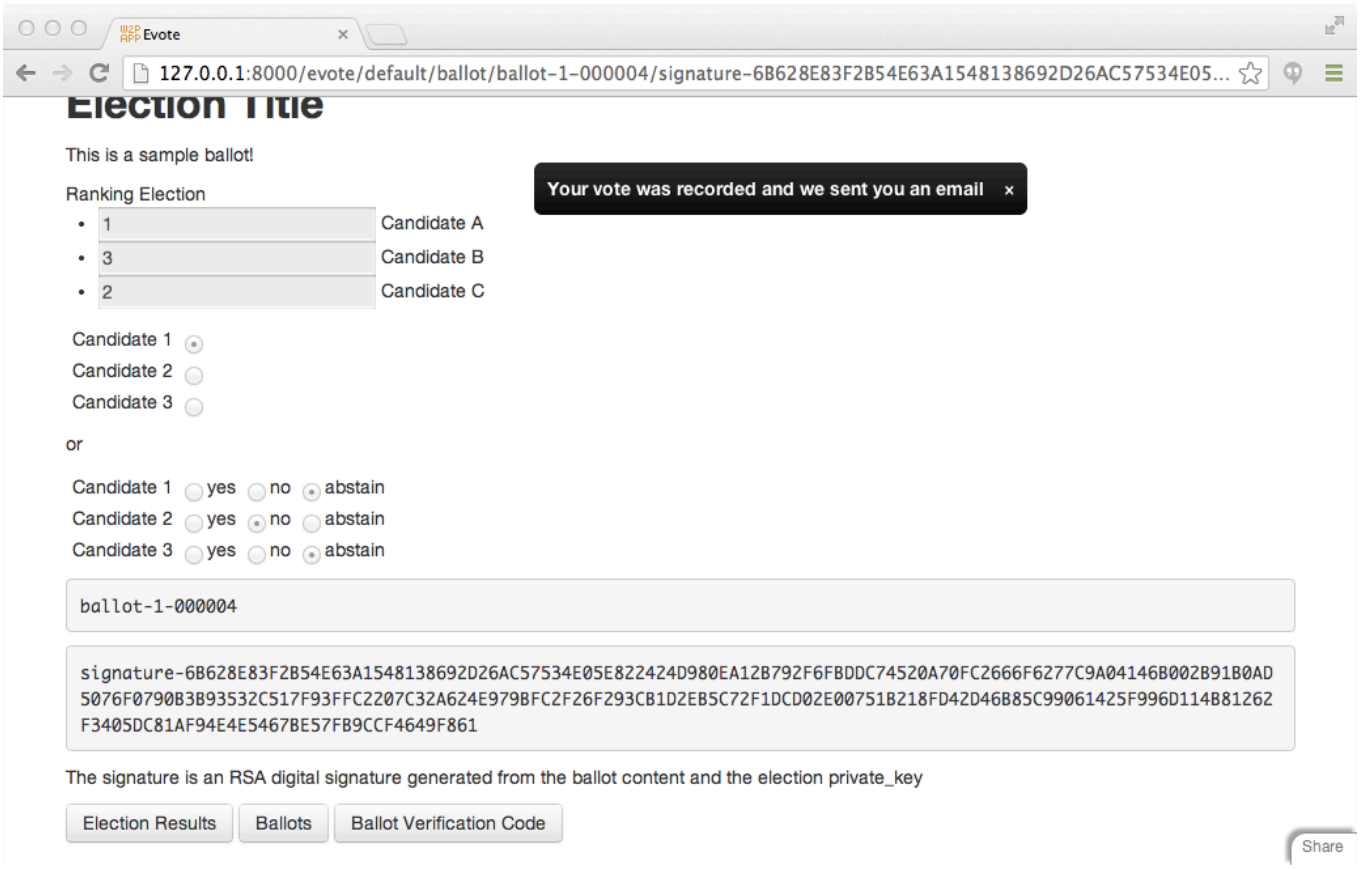
```
From: i.vote.secure@gmail.com
To: other.voter1@example.com
Subject: Election title [1]

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.

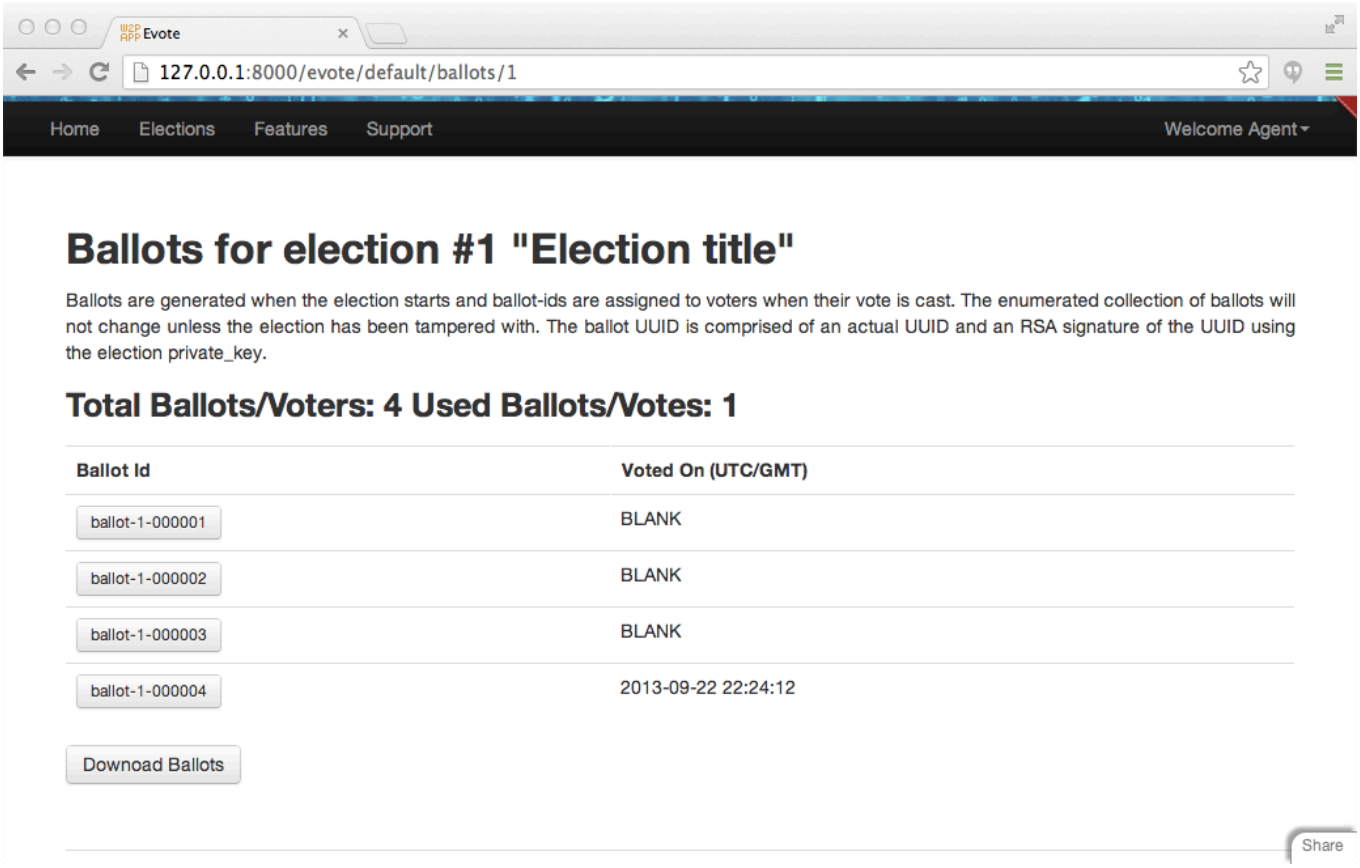
ATTENTION! The system assumes the voter does receive the email!



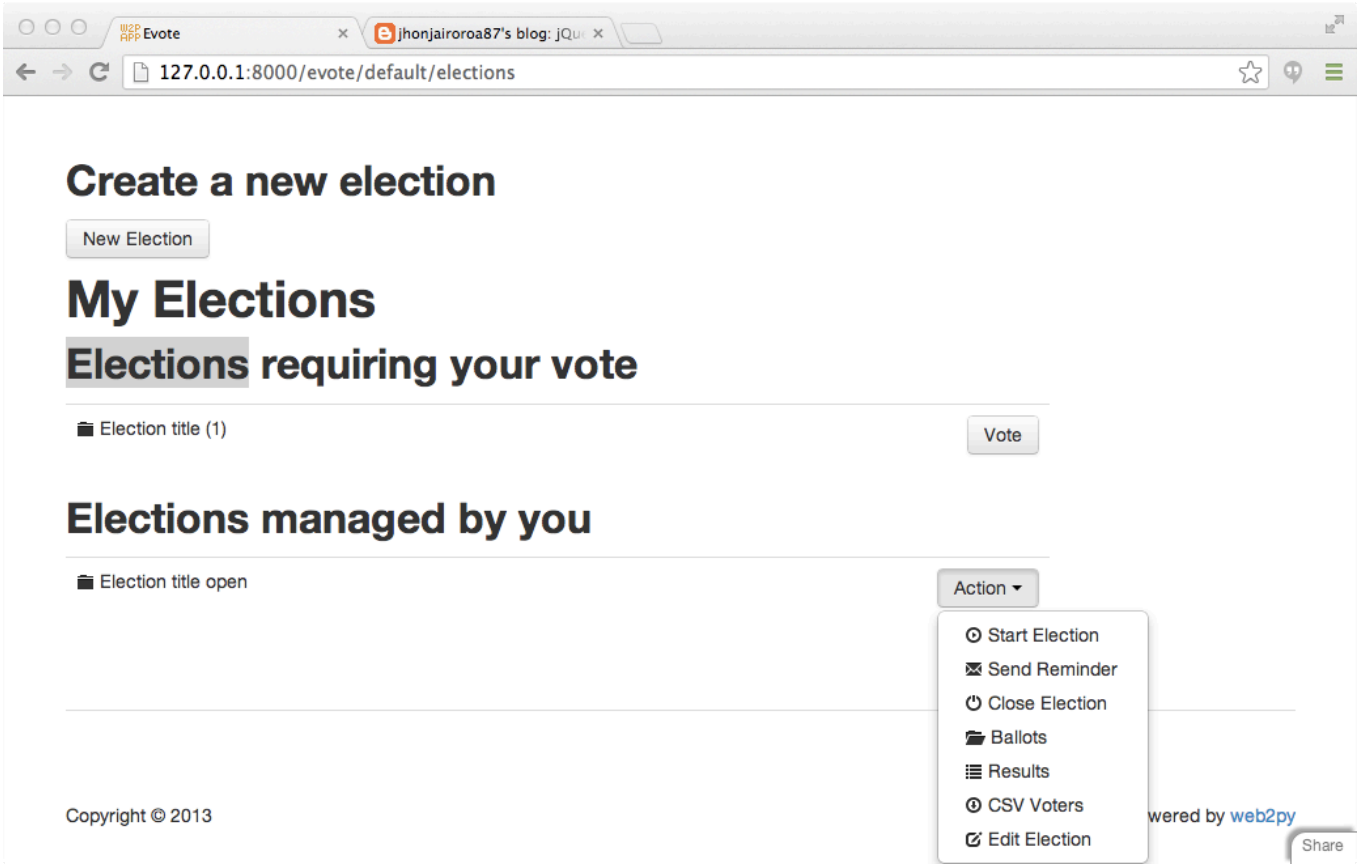
Upon voting the vote is recorded (linked to the ballot, not to the voter, thus anonymous) and the voter is presented with an acknowledgement pagen. The same content is also emailed to the voter as receipt and a copy is sent to the managers (anonymized) for verification.



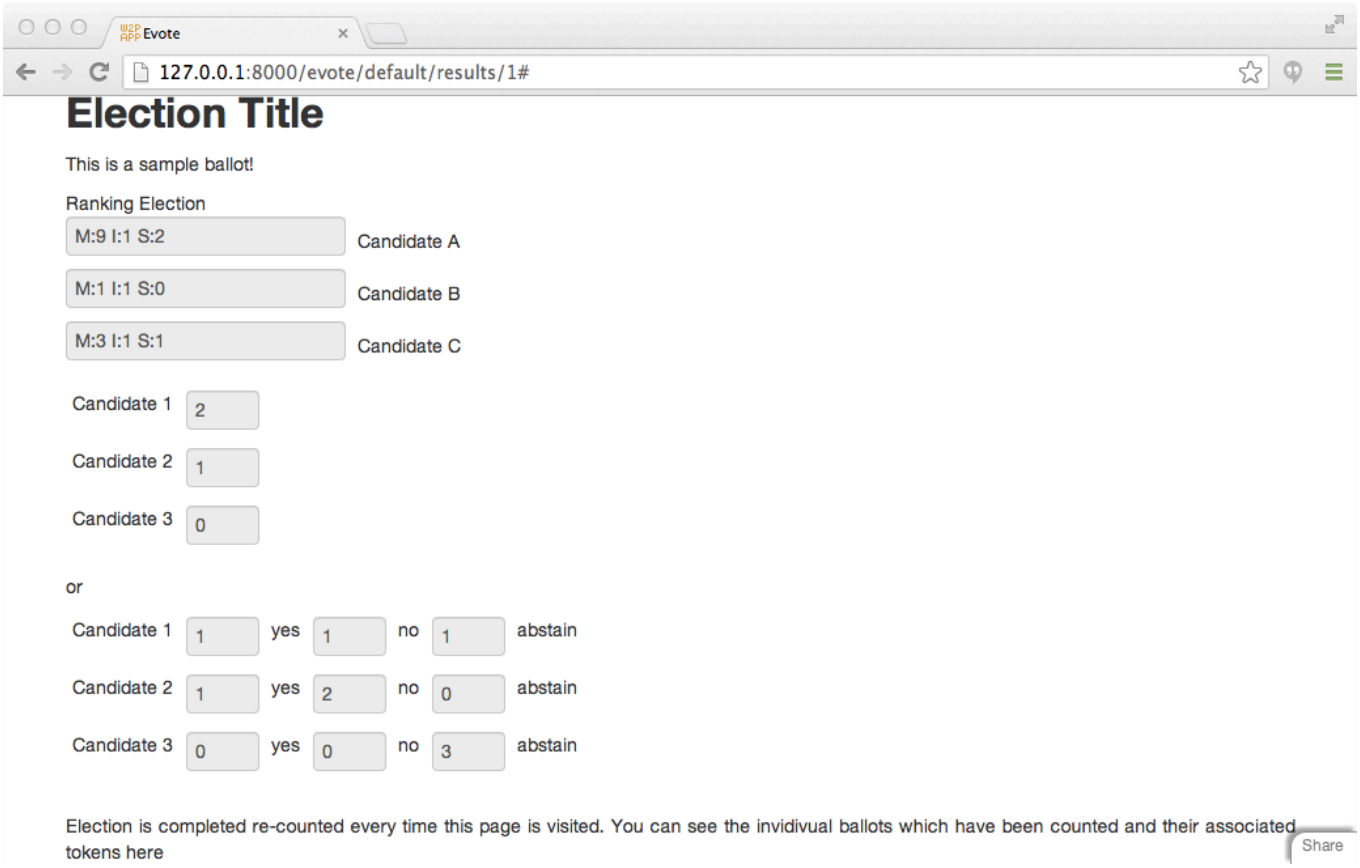
When a vote is cast, it is shown in the ballots page. This page is public to show that no new ballots are added or deleted. The actual ballots only become public when the election is closed.



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 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

Yet this part of eVote is to be considered experimental.