Open Data AIT Project

Source Code

https://github.com/amirroaster/aitproject

Abstract

The project is about the visualization of open data from DataSF. Users can register on the website, and get files. Without the registration, users are able to visualize the data.

Technologies

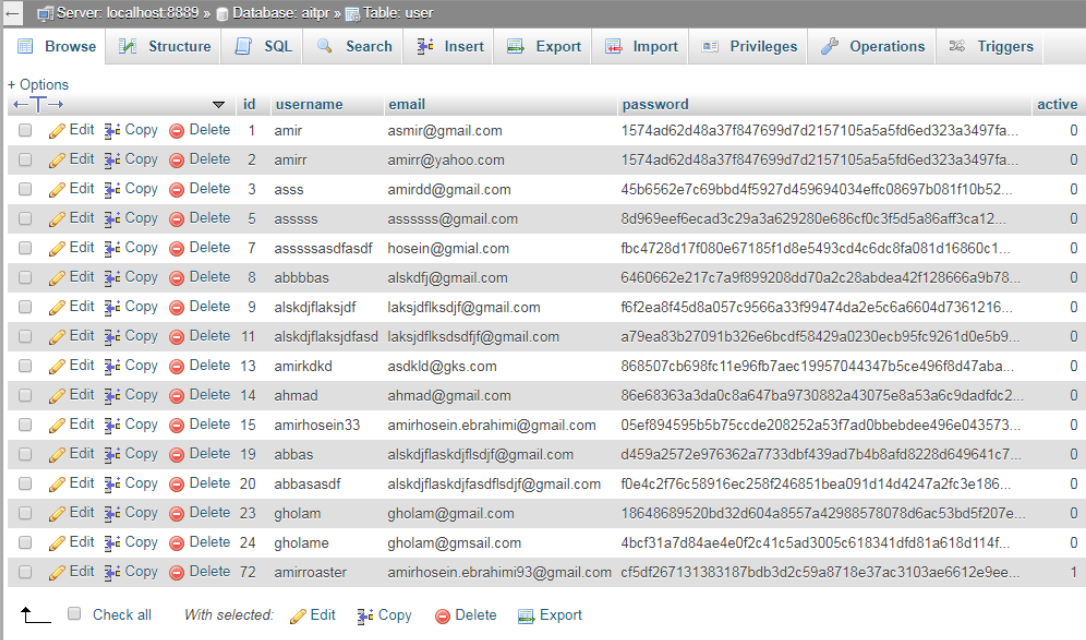PHP, SMTP Protocol, Ajax, html, JavaScript, jQuery, D3, DC, Leaflet, bootstrap, CSS

System Architecture

A three-tier architecture is used that provides many benefits for production and development environments by modularizing the user interface, business logic, and data storage layers. Doing so gives greater flexibility to development teams by allowing them to update a specific part of an application independently of the other parts.
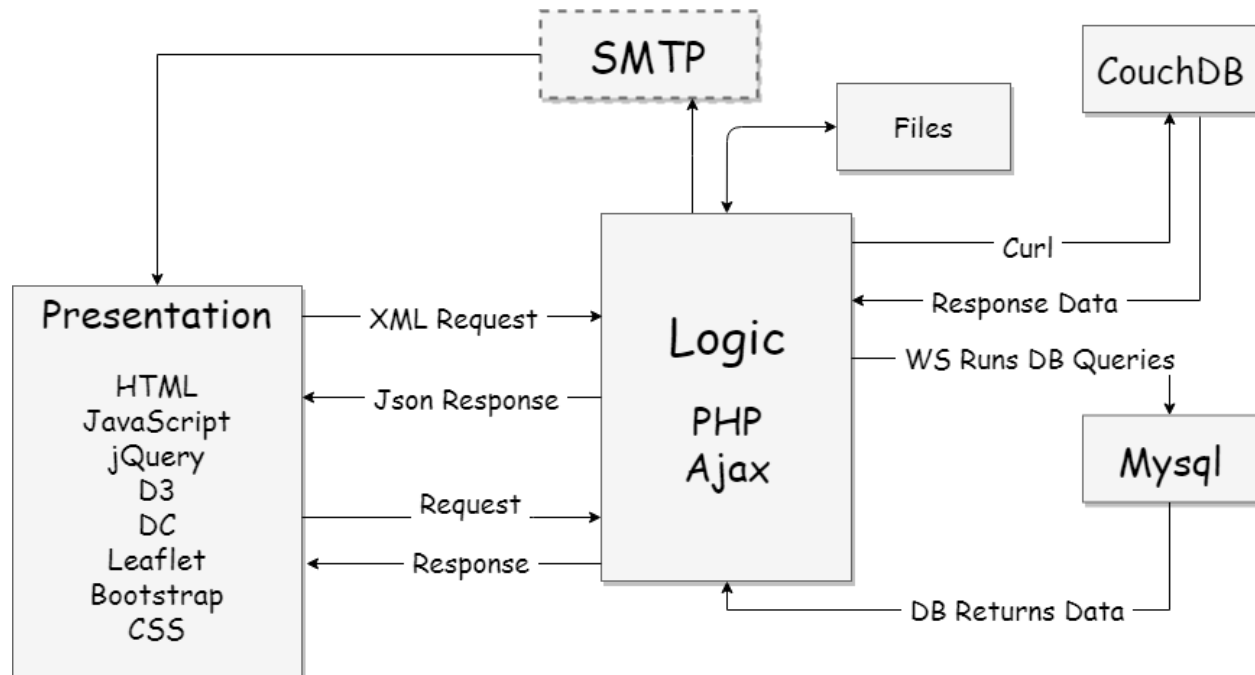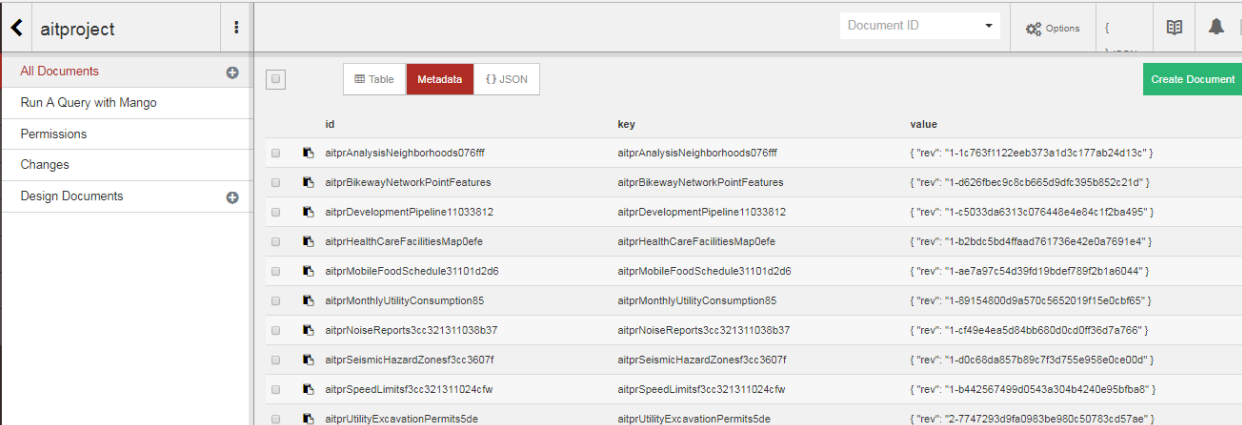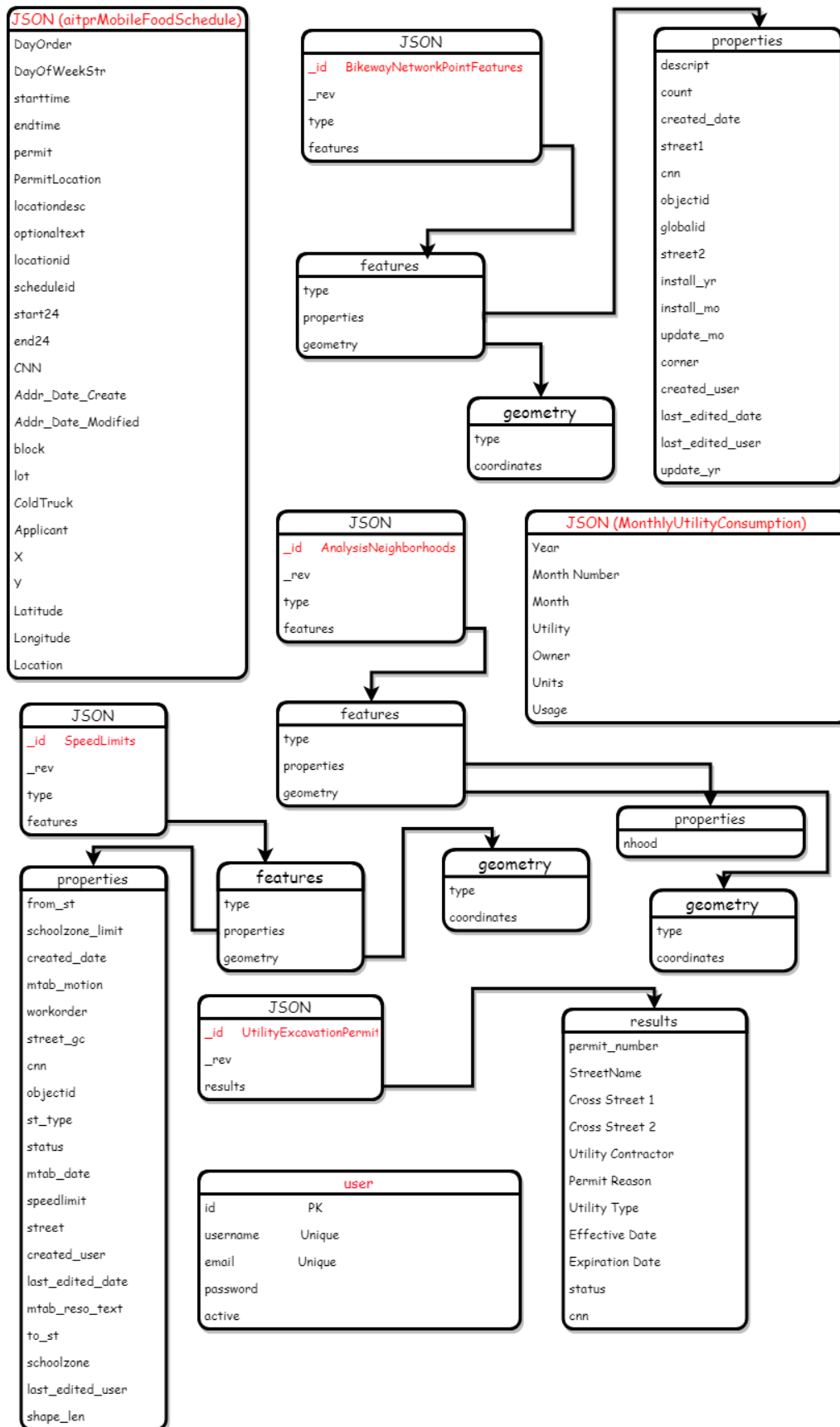
Database Design

MySQL is used for storing the information of users, and Apache QouchDB is used for storing JSON files, and for GEOJSON files. PHPMYADMIN is used for handling the administration of MySQL over the Web. Fauxton is a native web-based interface built into CouchDB. It provides a basic interface to the majority of the functionality, including the ability to create, update, delete and view documents and design documents. It provides access to the configuration parameters, and an interface for initiating replication.
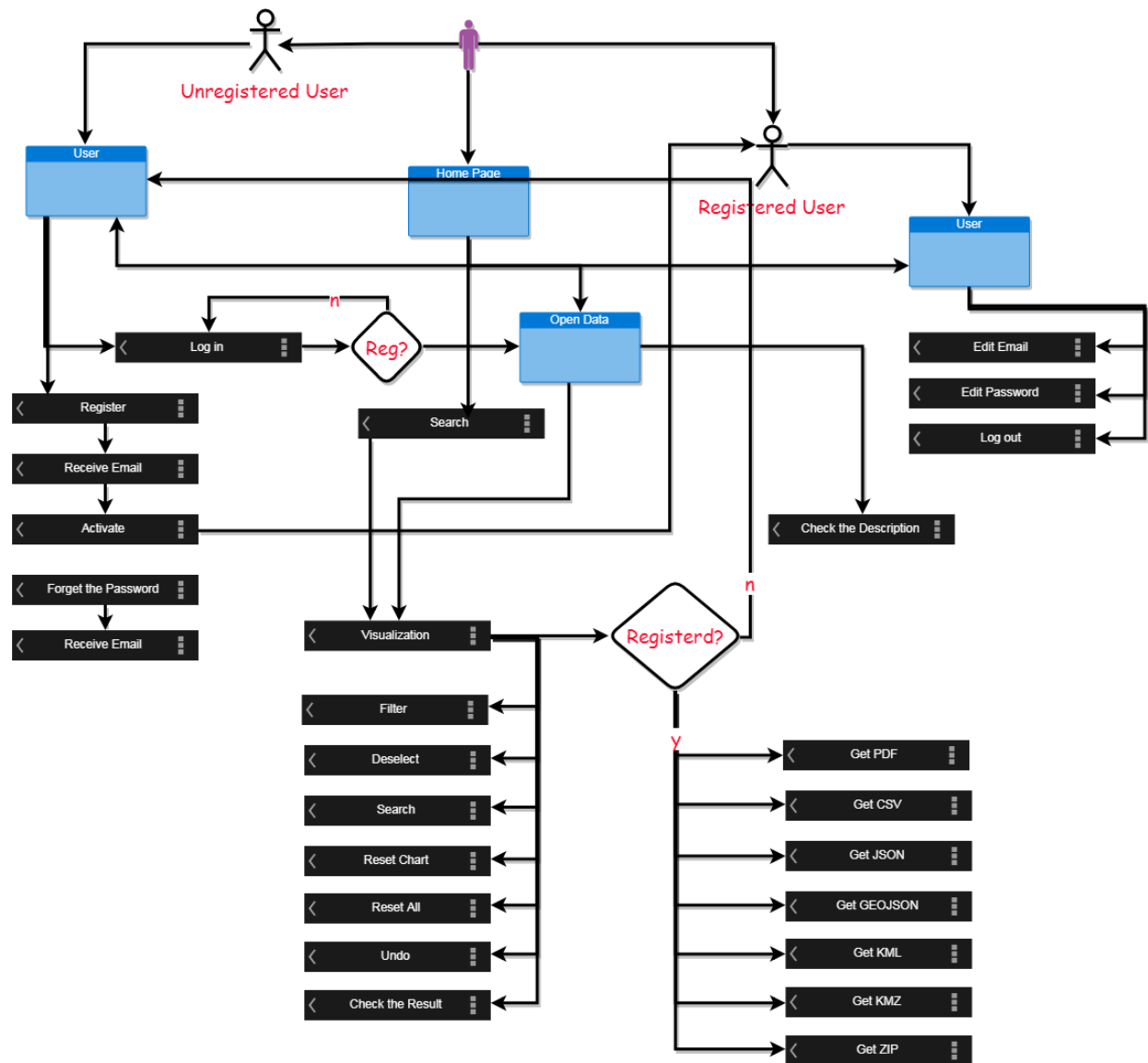

Open Data AIT Project
by Amir Ebrahimi (aebrahimi@unibz.it)

JSON (aitprMobileFoodSchedule)
- DayOrder
- DayOfWeekStr
- starttime
- endtime
- permit
- PermitLocation
- locationdesc
- optionaltext
- locationid
- scheduleid
- start24
- end24
- CNN
- Addr_Date_Create
- Addr_Date_Modified
- block
- lot
- ColdTruck
- Applicant
- X
- Y
- Latitude
- Longitude
- Location

JSON
- _id — BikewayNetworkPointFeatures
- _rev
- type
- features

features
- type
- properties
- geometry

geometry
- type
- coordinates

properties
- descript
- count
- created_date
- street1
- cnn
- objectid
- globalid
- street2
- install_yr
- install_mo
- update_mo
- corner
- created_user
- last_edited_date
- last_edited_user
- update_yr

JSON
- _id — AnalysisNeighborhoods
- _rev
- type
- features

JSON (MonthlyUtilityConsumption)
- Year
- Month Number
- Month
- Utility
- Owner
- Units
- Usage

features
- type
- properties
- geometry

JSON
- _id — SpeedLimits
- _rev
- type
- features

properties
- nhood

geometry
- type
- coordinates

properties
- from_st
- schoolzone_limit
- created_date
- mtab_motion
- workorder
- street_gc
- cnn
- objectid
- st_type
- status
- mtab_date
- speedlimit
- street
- created_user
- last_edited_date
- mtab_reso_text
- to_st
- schoolzone
- last_edited_user
- shape_len

features
- type
- properties
- geometry

geometry
- type
- coordinates

JSON
- _id — UtilityExcavationPermit
- _rev
- results

user
id	PK
username	Unique
email	Unique
password	
active	

results
- permit_number
- StreetName
- Cross Street 1
- Cross Street 2
- Utility Contractor
- Permit Reason
- Utility Type
- Effective Date
- Expiration Date
- status
- cnn

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Workflow

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Functionality

Two kinds of users are defined.

User (guest):

1. Log in
2. Register
3. Activate
4. Forget the Password
5. Search
6. Check the Description
7. Visualization (Filter, Deselect, Search, Reset Chart, Reset All, Undo, Check the Result)

User (registered):

1. Edit (Password, Email)
2. Log out
3. Search
4. Check the Description
5. Visualization (Filter, Deselect, Search, Reset Chart, Reset All, Undo, Check the Result)
6. Get Files (pdf, csv, json, geojson, kml, kmz, zip)

Screenshots
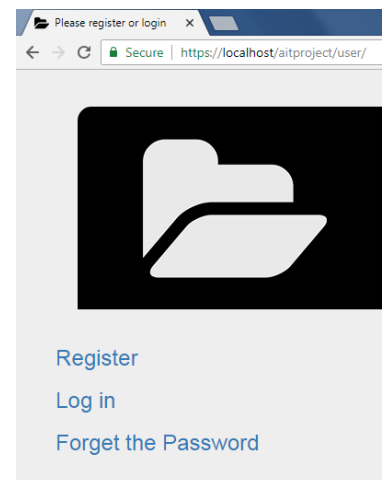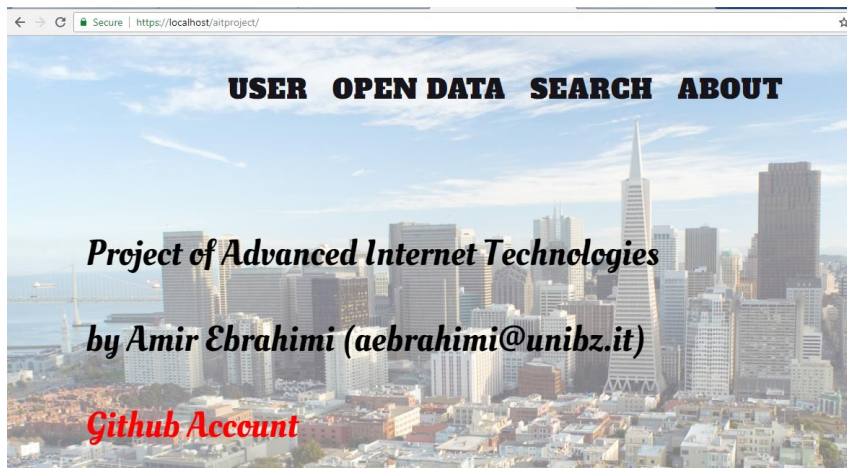
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by Amir Ebrahimi (aebrahimi@unibz.it)

Registraion

@ amirroaster

amirhosein.ebrahimi93@gmail.com

Password

Confirm Password

I'm not a robot — reCAPTCHA — Privacy - Terms

Register

Login

Forget the Password

Home
User
OpenData
Search

User Registration Successful
The activation link was sent to your email.

Registraion

@ amirroaster

amirhosein.ebrahimi93@gmail.com

Password

Activation Link

Admin <aitproject.2018bz@gmail.com>   8:14 PM (10 minutes ago)
to me

Dear amirroaster

Registration Email: amirhosein.ebrahimi93@gmail.com

Activation link: Activate

We are too glad.

by AitPr Team
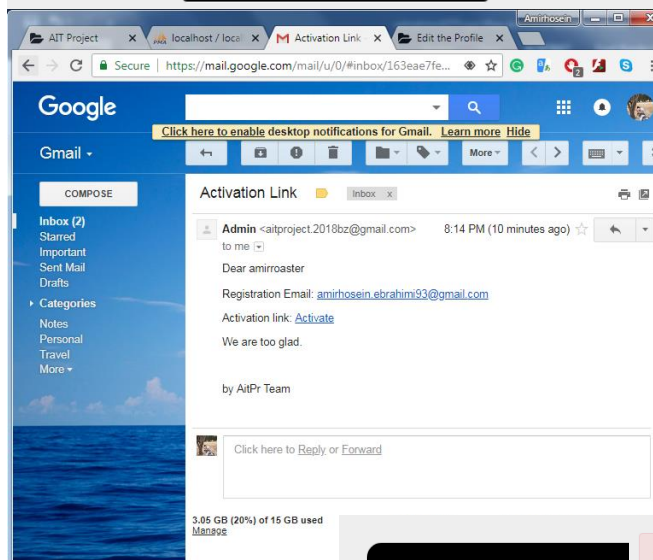
Home
User
OpenData
Search

Your account is activated successfully.
You can login now.

Please Login

@ amirroaster

I'm not a robot — reCAPTCHA — Privacy - Terms

Login

Register

Forget the Password

Hi amirroaster

Edit

Log out

You should use another password.

Edit the Profile

@ amirroaster

amirhosein.ebrahimi93@gmail.com

Old Password

New Password

Confirm New Password

Edit

Menu (repeated navigation)

Home
User
OpenData
Search

The account is updated.
You should log in again!

The password was sent to amirhosein.ebrahimi93@gmail.com

Edit the Profile

@ amirroaster

amirhosein.ebrahimi93@gmail.com

Old Password

New Password

Forget the Password

Email address

☐ I'm not a robot   reCAPTCHA
Privacy - Terms

Send the Password

Google

Gmail ▾

COMPOSE

Click here to enable desktop notifications for Gmail.   Learn more Hide

Inbox (2)
Starred
Important
Sent Mail
Drafts
▸ Categories
Notes
Personal
Travel
More ▾

Do you forget your password?   📁 Inbox x

Admin <aitproject.2018bz@gmail.com>   8:29 PM (0 minutes ago)
to me ▾

It seems that you are supposed to change your password on AITPr

Reset Password: Reset

by AitPr Team

Click here to Reply or Forward

3.05 GB (20%) of 15 GB used   Terms · Privacy   Last account activity: 1
Manage

Password is changed.
You can log in with the new password.

Reset the Password

@ amirroaster

New Password

Confirm New Password

Reset

☐ Secure   https://localhost/aitproject/search/

sche

No	Name	Link
1	Mobile Food Schedule	Link
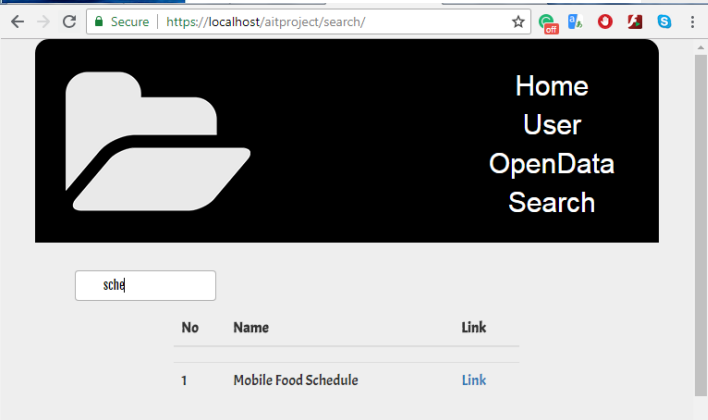
SF Development Pipeline 2017 Q2
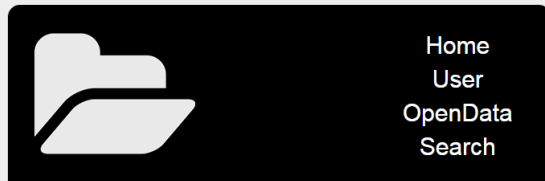
Snapshot of San Francisco Development Pipeline. Tracking of construction and entitlement activity based on data from Department of Building Inspection's Permit Tracking and the Planning Department's Project & Permit Tracking System, processed quarterly.

No Visualization

Analysis Neighborhoods

The Department of Public Health and the Mayor's Office of Housing and Community Development, with support from the Planning Department, created these 41 neighborhoods by grouping 2010 Census tracts, using common real estate and residents' definitions for the purpose of providing consistency in the analysis and reporting of socio-economic, demographic, and environmental data, and data on City-funded programs and services. They are not codified in Planning Code nor Administrative Code.

▾ Details
This dataset is produced by assigning Census tracts to neighborhoods based on existing neighborhood definitions used by Planning and MOHCD. A qualitative assessment is made to identify the appropriate neighborhood for a given tract based on understanding of population distribution and significant landmarks. Once all tracts have been assigned a neighborhood, the tracts are dissolved to produce this dataset, Analysis Neighborhoods.
Go to this page

Health Care Facilities Map

Health care facilities located in San Francisco

No Visualization

SFMTA Bikeway Network Point Features

| A. PURPOSE | Point features (e.g. bike signals) on the network of bike routes, lanes, and paths around the city of San Francisco as of September 2014. This data is subject to change and the SFMTA does not assume any responsibility or liability for any property damage, injury, or other adverse circumstances that may arise while using this mapping data.

▸ Details
Go to this page

Mobile Food Schedule

A child data set of --Mobile Food Facility Permit-- includes day of week, start / end time, location and a description of type of food sold by vendor.

Go to this page

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SFO Airport Monthly Utility Consumption for Natural Gas, Water, and Electricity

This data set includes monthly utility consumption separated between tenant owned and commission owned (City of SF owned) end uses. The utilities analyzed are natural gas, electricity and water.

Go to this page

Noise Reports

SF311 cases created since 7/1/2008 with location information

No Visualization

San Francisco Seismic Hazard Zones

This is a digital Seismic Hazard Zone Map presenting areas where liquefaction and landslides may occur during a strong earthquake. Three types of geological hazards, referred to as seismic hazard zones, may be featured on the map

▶ Details
No Visualization

Speed Limits

| A. PURPOSE | Speed limits are indicated primarily for streets that have speeds greater than 25 MPH, unless the speed limit has been changed from a higher speed. 25 MPH is the de fact speed limit for most residential and commercial streets, and apply to streets on this map denoted by a 0 MPH label. Alleys narrower than 25 feet can have de facto speed limits of 15 MPH.

▶ Details
Go to this page

Utility Excavation Permits

Excavation permits issued by SF Public Works whose status is active or approved and not past their end date. This is a subset of Street-Use Permits dataset.

Go to this page

---

localhost says

You have some selected neighborhoods on the pie chart.
If you are supposed to select some neighborhoods on map, you also should select the previous ones here.

OK

Get CSV   GET JSON   Get KML   Get KMZ   Get ZIP

Home
User
OpenData
Search

Analysis of Neighborhoods

Neighborhood

Reload

Neighborhood

No	Neighborhood Name	Area (Square Meter)
1	Inner Richmond	1311234
2	Inner Sunset	2508087

Hide it

41 selected out of 41 records | Reset All

Nhood	Area
Nob Hill	716070.9451817699
Bayview Hunters Point	9090492.026769357
Castro/Upper Market	1508960.5093174076
Chinatown	395321.2910026963
Excelsior	2449100.9016540237
Financial District/South Beach	1976821.2353415478
Glen Park	1176383.1894846181

1 selected out of 41 records | Reset All

Nhood	Area
Bayview Hunters Point	9090492.026769357

Selected: Sunset/Parkside, Bayview Hunters Point, Presidio Heights, Pacific Heights reset

Neighborhood: Selected: Bayview Hunters Point, Sunset/Parkside, Pacific Heights, Presidio Heights reset

← → C 🔒 Secure | https://localhost/aitproject/user/index.php

Home
User
OpenData
Search

Hi amirroaster
The file, named AnalysisNeighborhoods.csv, is sent to amirhosein.ebrahimi93@gmail.com

Edit

Log out

← → C 🔒 Secure | https://mail.google.com/mail/u/0/#inbox/163eb08235...

Google

Click here to enable desktop notifications for Gmail. Learn more Hide

Gmail ▾

COMPOSE

File from AitPr Website   Inbox x

Inbox (2)
Starred
Important
Sent Mail
Drafts
▸ Categories
Notes
Personal
Travel
More ▾

Admin <aitproject.2018bz@gmail.com   8:49 PM (1 minute ago)
to me ▾

Hello amirroaster,

Your file is following.

Regards,

AitPr Team

📄 AnalysisNeighbo...

← → C 🔒 Secure | https://localhost/aitproject/pages/BikewayN...

Get CSV GET JSON Get KML Get KMZ Get GEOJSON Get ZIP

Home
User
OpenData
Search

Bike-way Network Point Features

Reload

| Name | Street 1 | Street 2 |

Bike-way Network Point Features

Reload

	bike	san	Street 2
No	Bikeway Net Name	Street 1	Street 2	Year
1	BIKE BOX	SAN JOSE AVE	29TH ST	2011

Hide it

Selected: [object Object] reset

Installation Year: Selected: 2016, 2014 reset

2012(0%)
2016(79%)
2014(25%)
2015(0%)
2017(10%)
2018(0%)

Time:

1,128 selected out of 3,160 records | Reset All

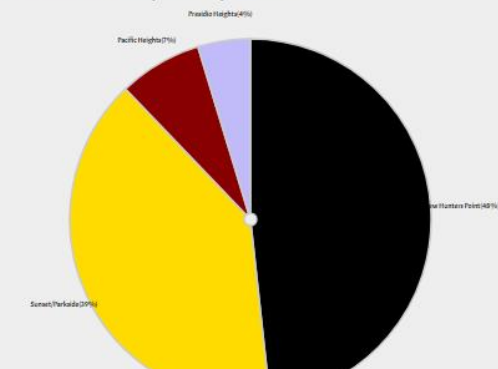| Permit Holder	Day	Start Time	End Time	Food Items	Address	Description
Creme Brulee To	Monday	08:00	19:00	Kettle Corn, Pizza, Coffee, Lattes, Cappuchino, Expresso, Hot Tea	870 MARKET ST	North side of Market between 4th and 5th

← → C 🔒 Secure | https://localhost/aitproject/pages/MobileFoodSchedule/

| Permit Holder | Food Items | Address | Start Time | End Time |

Day of Week: Selected: Friday, Tuesday, Thursday reset

Friday
Monday
Thursday
Tuesday
Wednesday
Saturday
Sunday

Wednesday(0%)
Friday(33%)
Tuesday(33%)
Monday(0%)
Thursday(33%)

← → C 🔒 Secure | https://localhost/aitproject/pages/MobileFoodSchedule/

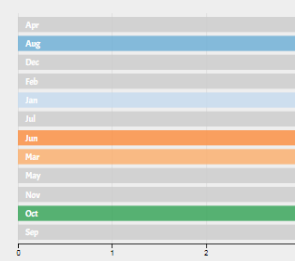|	Permit Holder	ice cream	Address	Start Time	End Time
No	Permit Holder	Food Items			Address
1	Singh Brothers Ice Cream	Ice Cream, Pre-Packaged Chips, Candies, Bottled Water & Canned SODA			1550 WALLACE AVE
2	Bay Area Dots, LLC	Hot dogs, condiments, soft pretzels, soft drinks, coffee, cold beverages, pastries, bakery goods, cookies, ice cream, candy, soups, churros, chestnuts, nuts, fresh fruit, fruit juices, desserts, potato chips and popcorn.			567 BAY ST
3	Singh Brothers Ice Cream	Ice Cream, Pre-Packaged Chips, Candies, Bottled Water & Canned SODA			1207 SHAFTER AVE
4	Singh Brothers Ice Cream	Ice Cream, Pre-Packaged Chips, Candies, Bottled Water & Canned SODA			1562 BANCROFT AVE
5	Singh Brothers Ice Cream	Ice Cream, Pre-Packaged Chips, Candies, Bottled Water & Canned SODA			35 NIBBI CT
6	Singh Brothers Ice Cream	Ice Cream, Pre-Packaged Chips, Candies, Bottled Water & Canned SODA			1173 INGERSON AVE

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by Amir Ebrahimi (aebrahimi@unibz.it)

Monthly Utility Consumption

Year Selected: 2014, 2016, 2015 reset

- 2013
- 2014
- 2015
- 2016
- 2017
- 2010
- 2011
- 2012

2017(0%) 2013(0%)

2016(33%)

2014(33%)

2015(33%)
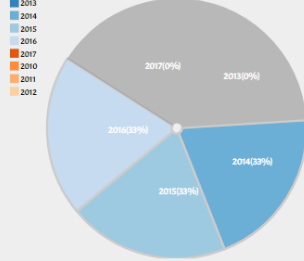
Month Selected: Mar, Aug, Jun, Jan, Oct reset

Apr	
Aug	
Dec	
Feb	
Jan	
Jul	
Jun	
Mar	
May	
Nov	
Oct	
Sep	

0 1 2 3

Utility Selected: Water, Gas reset

Water
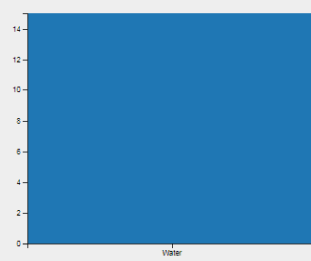
Owner Selected: Commission reset

- Commission
- Tenant
- Campus

Tenant(0%) Commission(100%)
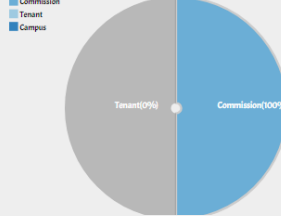
Units Selected: Million Gallons reset

Million Gallons   Therms
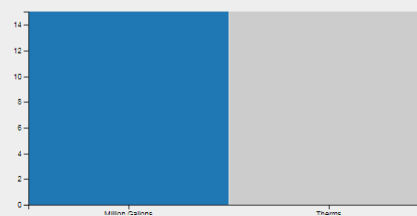
Whole Usage: 350k

49 selected out of 600 records | Reset All

Year	Month Number	Month	Utility	Owner	Units	Usage
2014	1	Jan	Gas	Commission	Therms	287730
2013	1	Jan	Gas	Commission	Therms	351489
2013	5	May	Gas	Commission	Therms	253194
2013	6	Jun	Gas	Commission	Therms	225358
2013	8	Aug	Gas	Commission	Therms	223986
2013	10	Oct	Gas	Commission	Therms	256241

localhost/aitproject/pages/SpeedLimits/

Speed Limits

Reload

guy   From Street ...   To Street ...

No	Street Name	Street Type	Street Length	Speed Limit	School Zone	From Street	To Street	
1	GUY	PL	535	0	No	01ST ST	LANSING ST	Show on Map

Hide it

Leaflet | © OpenStreetMap Contributors

Length Speed Limit

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Performance

Minified JavaScript means less bytes being downloaded from the client perspective.

For example, the same actions with full JavaScript codes and minified JavaScript codes are investigated. As it is shown, without minifying, 79% of time is related to scripting. While with minified JavaScript, scripting is decreased up to 55%.

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Range: 0 – 2.9 min

- 834.6 ms — Loading
- 137170.3 ms — Scripting
- 3929.3 ms — Rendering
- 1142.0 ms — Painting
- 4386.0 ms — Other
- 25017.6 ms — Idle

172480 ms

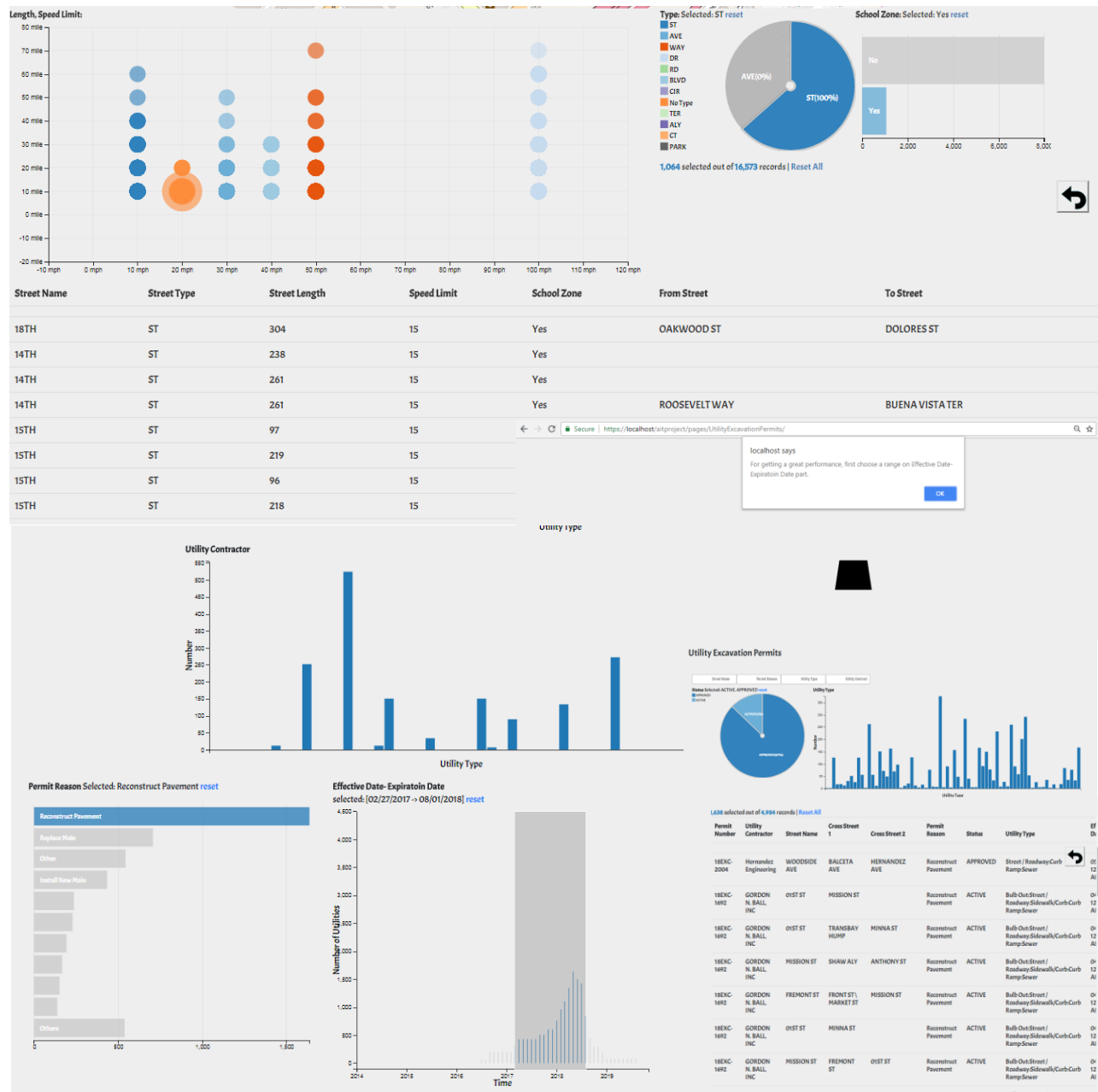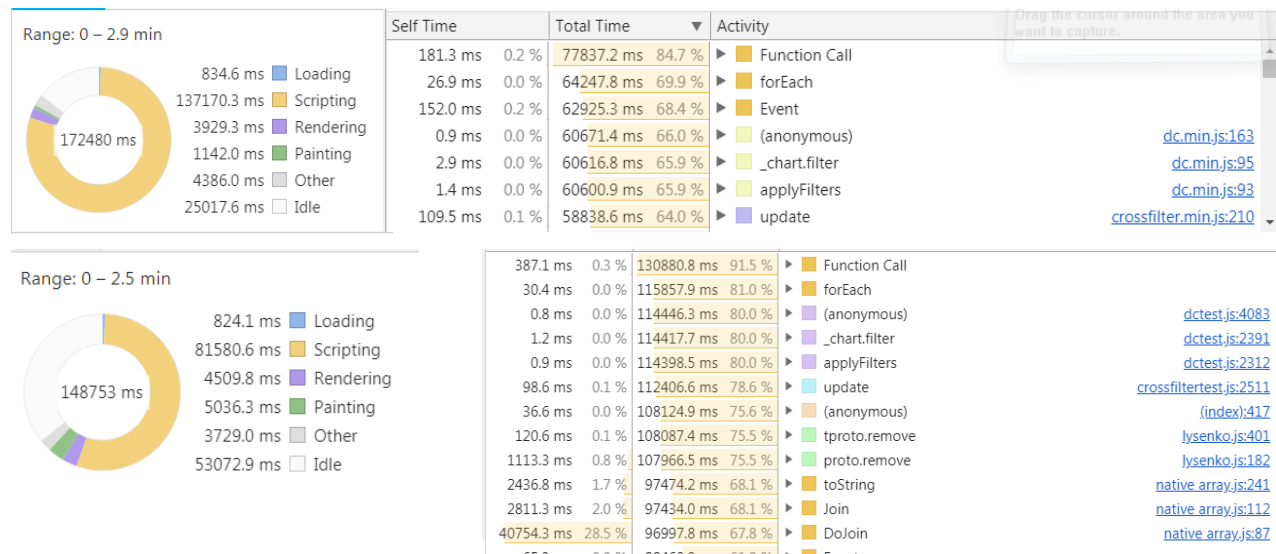| Self Time		Total Time	▼	Activity	
181.3 ms	0.2 %	77837.2 ms	84.7 %	▶ Function Call	
26.9 ms	0.0 %	64247.8 ms	69.9 %	▶ forEach	
152.0 ms	0.2 %	62925.3 ms	68.4 %	▶ Event	
0.9 ms	0.0 %	60671.4 ms	66.0 %	▶ (anonymous)	dc.min.js:163
2.9 ms	0.0 %	60616.8 ms	65.9 %	▶ _chart.filter	dc.min.js:95
1.4 ms	0.0 %	60600.9 ms	65.9 %	▶ applyFilters	dc.min.js:93
109.5 ms	0.1 %	58838.6 ms	64.0 %	▶ update	crossfilter.min.js:210

Range: 0 – 2.5 min

- 824.1 ms — Loading
- 81580.6 ms — Scripting
- 4509.8 ms — Rendering
- 5036.3 ms — Painting
- 3729.0 ms — Other
- 53072.9 ms — Idle

148753 ms

Self Time		Total Time		Activity	
387.1 ms	0.3 %	130880.8 ms	91.5 %	▶ Function Call	
30.4 ms	0.0 %	115857.9 ms	81.0 %	▶ forEach	
0.8 ms	0.0 %	114446.3 ms	80.0 %	▶ (anonymous)	dctest.js:4083
1.2 ms	0.0 %	114417.7 ms	80.0 %	▶ _chart.filter	dctest.js:2391
0.9 ms	0.0 %	114398.5 ms	80.0 %	▶ applyFilters	dctest.js:2312
98.6 ms	0.1 %	112406.6 ms	78.6 %	▶ update	crossfiltertest.js:2511
36.6 ms	0.0 %	108124.9 ms	75.6 %	▶ (anonymous)	(index):417
120.6 ms	0.1 %	108087.4 ms	75.5 %	▶ tproto.remove	lysenko.js:401
1113.3 ms	0.8 %	107966.5 ms	75.5 %	▶ proto.remove	lysenko.js:182
2436.8 ms	1.7 %	97474.2 ms	68.1 %	▶ toString	native array.js:241
2811.3 ms	2.0 %	97434.0 ms	68.1 %	▶ Join	native array.js:112
40754.3 ms	28.5 %	96997.8 ms	67.8 %	▶ DoJoin	native array.js:87
65.2 ms	0.0 %	88469.0 ms	61.8 %	▶ Event	

Also, there are some alerts for users which if they consider those points, they will have a better performance.

The project prevents from script injection in JavaScript. As an instance, Ajax is used for getting data from a PHP file.
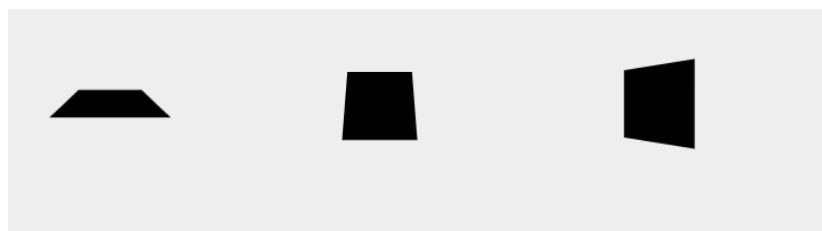
UX/UI Analysis

Although, investigating the data on some charts needs a large-enough screen, it is tried to have a responsive style.

Undo Button: in the most parts of visualization, undo button is enabled.

Processing Block

When the page is loading, a processing block is appeared. It provides a better feeling for users.
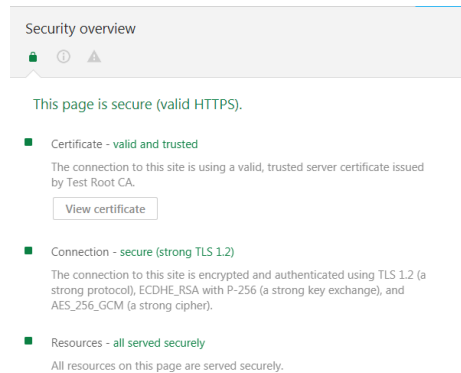

Security Analysis

1. SSL
   SSL certificates create an encrypted connection and establish trust. One of the most important components of online business is creating a trusted environment where potential customers feel confident in making purchases. SSL certificates create a foundation of trust by establishing a

secure connection. To ensure visitors their connection is secure, browsers provide visual cues, such as a lock icon or a green bar.

SSL certificates have a key pair: a public and a private key. These keys work together to establish an encrypted connection. The certificate also contains what is called the "subject," which is the identity of the certificate/website owner.

Security overview

🔒 ⓘ ⚠

This page is secure (valid HTTPS).

■ Certificate - valid and trusted
The connection to this site is using a valid, trusted server certificate issued by Test Root CA.

[View certificate]

■ Connection - secure (strong TLS 1.2)
The connection to this site is encrypted and authenticated using TLS 1.2 (a strong protocol), ECDHE_RSA with P-256 (a strong key exchange), and AES_256_GCM (a strong cipher).

■ Resources - all served securely
All resources on this page are served securely.

2. Password Hashing
Hashing is a type of algorithm which takes any size of data and turns it into a fixed-length of data. This is often used to ease the retrieval of data as you can shorten large amounts of data to a shorter string (which is easier to compare).
MD5 has a 128 bits hash value vs 256 bits of SHA-256. That means that for SHA-256, the possibility for collisions (2 different messages having the same hash value) is lots and lots smaller than for MD5: Not 2 times as some people think, but 340282366920938463463374607431768211456 times smaller (= 2^256 / 2^128 = 2^128). In fact, tests have been performed were data collisions were achieved with MD5. MD5 dates from 1991 whereas SHA-256 was published in 2001. So the algorithm of SHA-256 is more sofisticated and up to date. Hence SHA-256 is used in the project.

3. ReCAPTCHA
ReCAPTCHA is a free service that protects the website from spam and abuse. ReCAPTCHA uses an advanced risk analysis engine and adaptive CAPTCHAs to keep automated software from engaging in abusive activities on your site. It does this while letting your valid users pass through with ease.
ReCAPTCHA offers more than just spam protection. Every time CAPTCHAs are solved, that human effort helps digitize text, annotate images, and build machine learning datasets. This in turn helps preserve books, improve maps, and solve hard AI problems.

4. Communicate with the user through SMTP
For example, it is used for sending activation link. The Use of fake emails does not result in the activation of the account. PHPMailer is one of the best libraries in order to satisfy this goal.

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by Amir Ebrahimi (aebrahimi@unibz.it)

Lesson Learned

1. Sessions in PHP
2. Working with CouchDB
3. Read data by Ajax
4. Working with PHPMailer
5. Working with Recaptcha
6. Working with D3
7. Working with DC (all charts)
8. Working with Leaflet
9. Implementing SSL on localhost