StatsVG

Mapping Classroom Enrollment Occupancy Data By Time

San Jose State University
Anh Trinh

Outline

- Case Study
- Application Overview
- Architecture
  - Preprocessing - data acquisition
  - Post processing - building XML data files
  - Pre-Rendering SVG via Javascript onload()
  - Transforming Inkscape-generated SVG
  - Prepare Javascript Event
- Demo

Case Study

- Work based on statistical data
- School Administration
  - Create classes
  - Schedule building and classroom
  - Avoid building overpopulation
  - Fire hazard

Application Overview

- Mapstistic
  - 2009 Spring SJSU Enrollment Data
  - Bar chart like to show occupancy percentage
  - Detail view with pie chart and information
  - Slider to dynamically view data at different times

Preprocessing

- Preprocessing - data acquisition
- Scrape the SJSU official schedule found at www.sjsu.edu
- Crawler – Java program
  - Read HTML content
  - Regular Expression parses essential info
    - Schedule, Title, Section Code, Units, Type, Enrollment Days, Time, Dates, Location, Instructor, and other
  - Update DOM Document

Preprocessing (cont'd)

- Preprocessing (cont'd)

Fall 2009

Fall Schedule
Spring Schedule
Summer Schedule
Real-Time Courses
Archive

ADVERTISING
AEROSPACE ENGINEERING
AEROSPACE STUDIES
AFRICAN AMERICAN STUDIES
AFRICAN STUDIES
AMERICAN STUDIES
ANTHROPOLOGY
APPLIED SCIENCES & ARTS
ARABIC
ART
ART EDUCATION
ART HISTORY
ASIAN AMERICAN STUDIES
ASIAN STUDIES

ADVERTISING

ADVERTISING

Spring Schedule
Summer Schedule
Real-Time Courses
Archive

ADV 091	Intro Advertising	s01	MW	1030 1145
ADV 091	Intro Advertising	s02	TR	0900 1015
ADV 116	Spartan Daily Ad S	s01	MTWR	1330 1615
ADV 121	Consumer Adverti	s01	MW	1330 1445
ADV 122	Bus-to-Bus Adve	s02	TR	1200 1315
ADV 123	Brdcast & New di	s01	T	1800 2045
ADV 124	Copywriting	s01	TR	1630 1745
ADV 124	Copywriting	s02	MW	1500 1615
ADV 125	Ad Layout rod	s01	MW	1630 1745
ADV 125	Ad Layout Prod	s02	M	1800 2045
ADV 126	Media Pl ing & B	s01	TR	1630 1745
ADV 128	Integrt ktg Comm	s01	M	1800 2045
ADV 129	Camp gns Mgmt	s01	TR	1030 1145

Fall Schedule
Spring Schedule
Summer Schedule
Real-Time Courses
Archive

ADV 091

Schedule	Fall 2009
Title	Intro Advertising
GE Designator	
Footnotes	
Section	01
Code	40010
Units	3
Type	LEC
Enrollment	62/60 spaces filled
Days	MW
Time	1030 1145
Dates	08/24/09 12/08/09
Location	DBH 133
Instructor	G Nortey

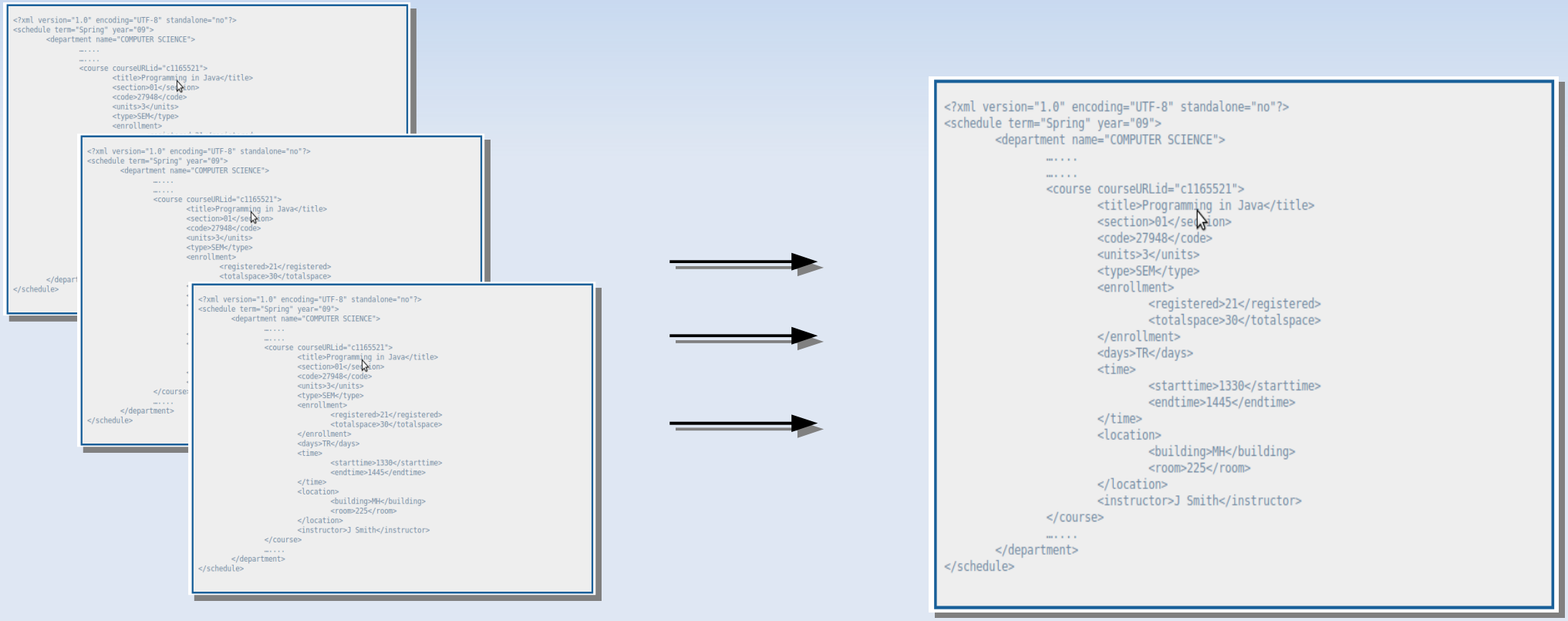
Page last generated: 09/21/2009 14:35:23

Preprocessing (cont'd)

Preprocessing (cont'd): Final XML output

```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<schedule term="Spring" year="09">
        <department name="COMPUTER SCIENCE">
                ……..
                ……..
                <course courseURLid="c1165521">
                        <title>Programming in Java</title>
                        <section>01</section>
                        <code>27948</code>
                        <units>3</units>
                        <type>SEM</type>
                        <enrollment>
                                <registered>21</registered>
                                <totalspace>30</totalspace>
                        </enrollment>
                        <days>TR</days>
                        <time>
                                <starttime>1330</starttime>
                                <endtime>1445</endtime>
                        </time>
                        <location>
                                <building>MH</building>
                                <room>225</room>
                        </location>
                        <instructor>J Smith</instructor>
                </course>
                ……..
        </department>
</schedule>
```

Post-Processing



Post-Processing (cont'd)

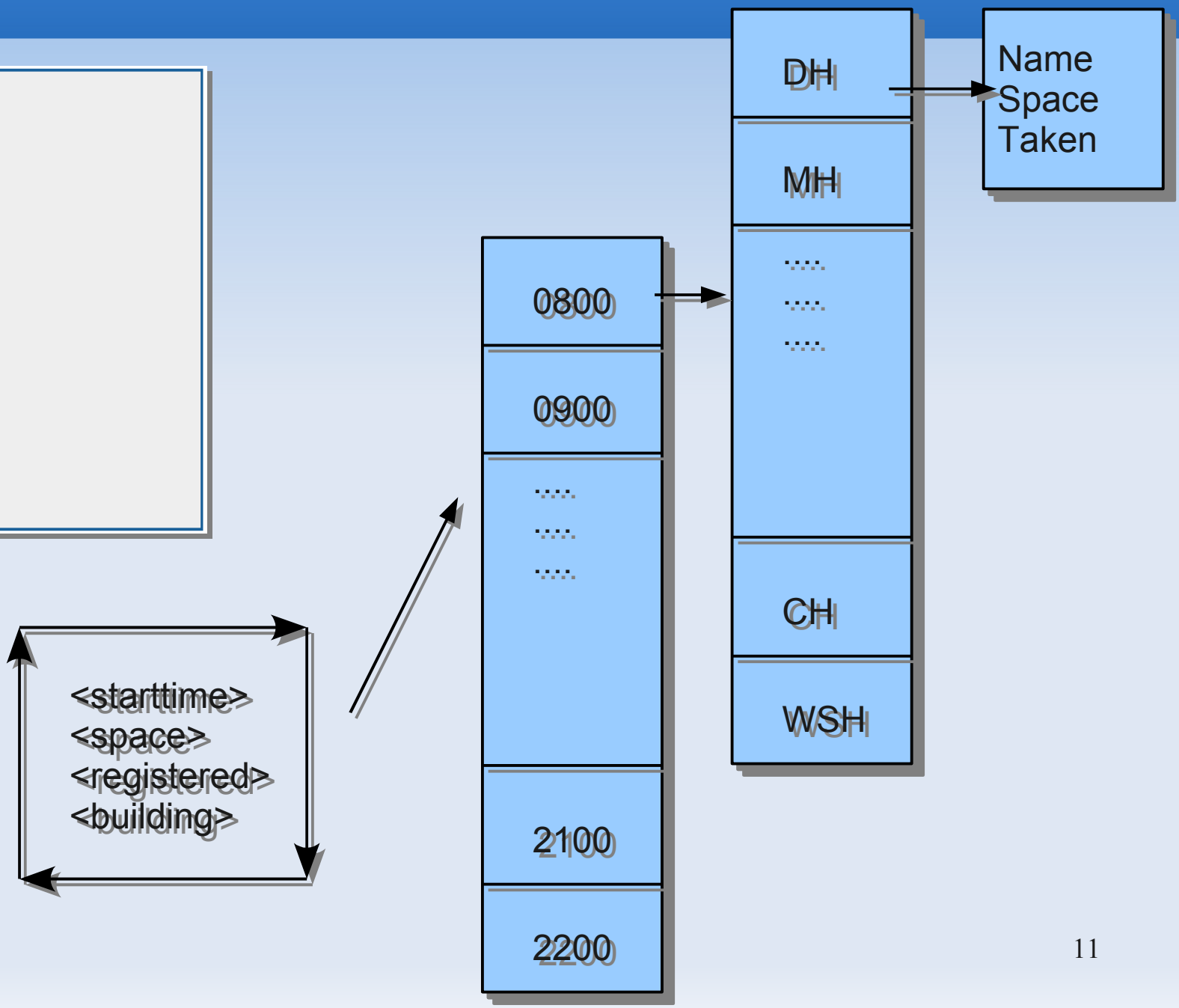
- Department XML
  - 130 XML documents
  - Sizes range from 148b to 153Kb
- After combining
  - 3.4MB
  - 6192 <course> XML element nodes

Pre-render

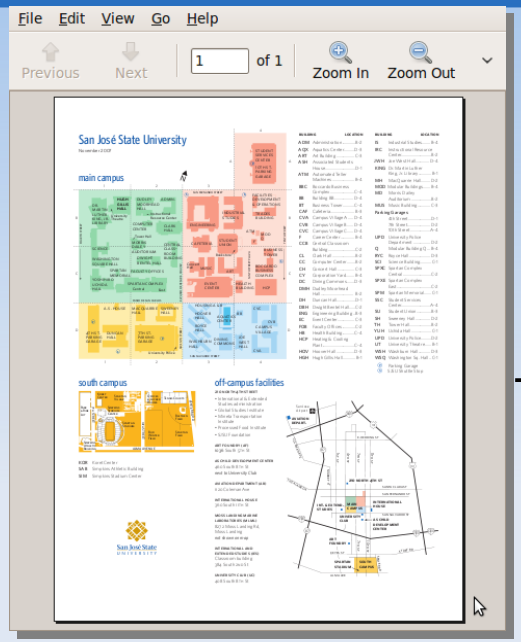
- Onload()
  - Load XML data and build 2-Dimensional Array Indexed by Time, Building
  - 2-D array models a map
    - <time X building>: capacity
    - `function BuildingCapacity(name, space, taken)`
  - Array elements contain detailed information

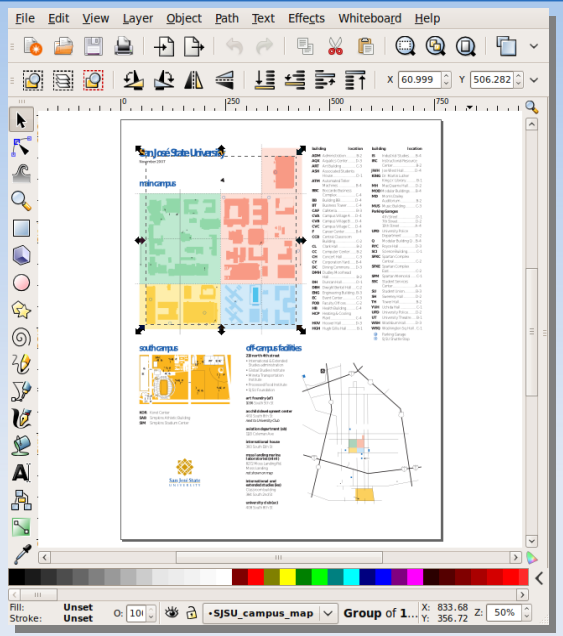
Pre-render (cont'd)

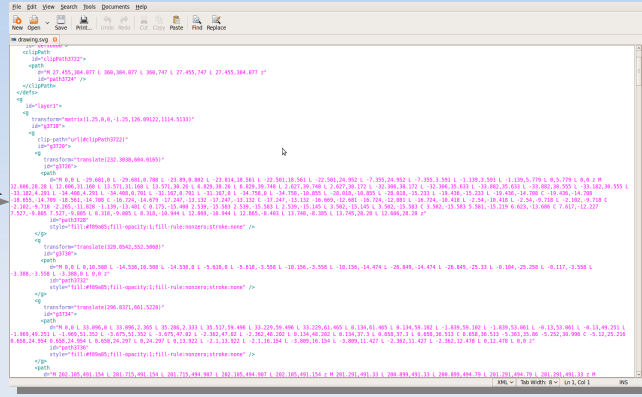
```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<schedule term="Spring" year="09">
        <department name="COMPUTER SCIENCE">
                ".....
                ".....
                <course courseURLid="c1165521">
                        <title>Programming in Java</title>
                        <section>01</section>
                        <code>27948</code>
                        <units>3</units>
                        <type>SEM</type>
                        <enrollment>
                                <registered>21</registered>
                                <totalspace>30</totalspace>
                        </enrollment>
                        <days>TR</days>
                        <time>
                                <starttime>1330</starttime>
                                <endtime>1445</endtime>
                        </time>
                        <location>
                                <building>MH</building>
                                <room>225</room>
                        </location>
                        <instructor>J Smith</instructor>
                </course>
                ".....
        </department>
</schedule>
```

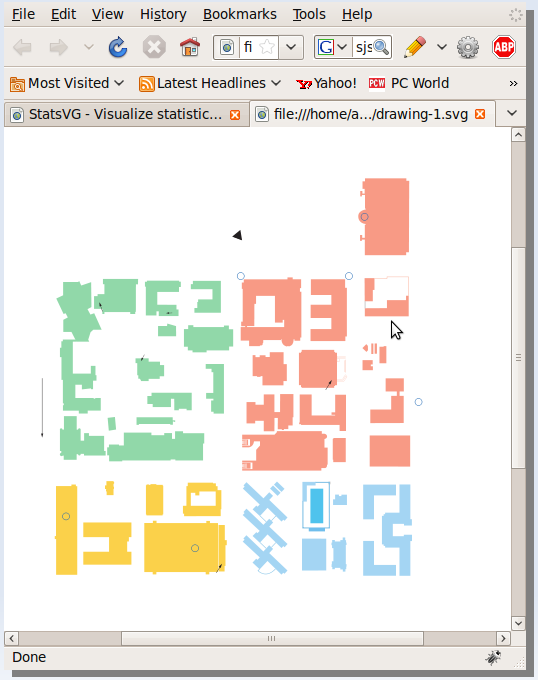


Transforming Inkscape-generated SVG









Prepare JavaSript Event

File Edit View Search Tools Documents Help

New Open Save Print... Undo Redo Cut Copy Paste Find Replace

drawing.svg

```
    <clipPath
       id="clipPath3722">
      <path
         d="M 27.455,384.077 L 360,384.077 L 360,747 L 27.455,747 L 27.455,384.077 z"
         id="path3724" />
    </clipPath>
  </defs>
  <g
     id="layer1">
    <g
       transform="matrix(1.25,0,0,-1.25,126.09122,1114.5133)"
       id="g3718">
      <g
         clip-path="url(#clipPath3722)"
         id="g3720">
        <g
           transform="translate(232.3038,604.0165)"
           id="g3726">
          <path
             d="M 0,0 L -29.681,0 L -29.681,0.788 L -23.89,0.802 L -23.814,18.561 L -22.501,18.561 L -22.501,24.952 L -7.355,24.952 L -7.355,3.591 L -1.139,3.591 L -1.139,5.779 L 0,5.779 L 0,0 z M
12.606,28.28 L 12.606,31.168 L 13.571,31.168 L 13.571,38.26 L 6.829,38.26 L 6.829,39.748 L 2.627,39.748 L 2.627,38.172 L -32.306,38.172 L -32.306,35.633 L -33.882,35.633 L -33.882,30.555 L -33.182,30.555 L
-33.182,4.291 L -34.408,4.291 L -34.408,0.701 L -31.167,0.701 L -31.167,0 L -34.758,0 L -34.758,-10.855 L -28.018,-10.855 L -28.018,-15.233 L -19.436,-15.233 L -19.436,-14.708 C -19.436,-14.708
-18.655,-14.709 -18.561,-14.708 C -16.724,-14.679 -17.247,-13.132 -17.247,-13.132 C -17.247,-13.132 -16.669,-12.681 -16.724,-12.081 L -16.724,-10.418 L -2.54,-10.418 L -2.54,-9.718 L -2.102,-9.718 C
-2.102,-9.718 -2.265,-11.828 -1.139,-13.481 C 0.175,-15.408 2.539,-15.583 2.539,-15.583 L 2.539,-15.145 L 3.502,-15.145 L 3.502,-15.583 C 3.502,-15.583 5.581,-15.219 6.623,-13.686 C 7.617,-12.227
7.527,-9.805 7.527,-9.805 L 8.318,-9.805 L 8.318,-10.944 L 12.869,-10.944 L 12.865,-8.403 L 13.748,-8.385 L 13.745,28.28 L 12.606,28.28 z"
             id="path3728"
             style="fill:#f89a85;fill-opacity:1;fill-rule:nonzero;stroke:none" />
        </g>
        <g
           transform="translate(328.0542,552.5068)"
           id="g3730">
          <path
             d="M 0,0 L 0,10.508 L -14.536,10.508 L -14.536,0 L -5.618,0 L -5.618,-3.558 L -10.156,-3.558 L -10.156,-14.474 L -26.849,-14.474 L -26.849,-25.33 L -0.104,-25.258 L -0.117,-3.558 L
-3.388,-3.558 L -3.388,0 L 0,0 z"
             id="path3732"
             style="fill:#f89a85;fill-opacity:1;fill-rule:nonzero;stroke:none" />
        </g>
        <g
           transform="translate(296.8371,661.5228)"
           id="g3734">
          <path
             d="M 0,0 L 33.096,0 L 33.096,2.365 L 35.286,2.333 L 35.517,59.496 L 33.229,59.496 L 33.229,61.465 L 0.134,61.465 L 0.134,59.102 L -1.839,59.102 L -1.839,53.061 L -0.13,53.061 L -0.13,49.251 L
-1.969,49.251 L -1.969,51.352 L -3.675,51.352 L -3.675,47.02 L -2.362,47.02 L -2.362,48.202 L 0.134,48.202 L 0.134,37.3 L 0.658,37.3 L 0.658,36.513 C 0.658,36.513 -5.363,35.86 -5.252,30.996 C -5.12,25.216
0.658,24.954 0.658,24.954 L 0.658,24.297 L 0,24.297 L 0,13.922 L -2.1,13.922 L -2.1,16.154 L -3.809,16.154 L -3.809,11.427 L -2.362,11.427 L -2.362,12.478 L 0,12.478 L 0,0 z"
             id="path3736"
             style="fill:#f89a85;fill-opacity:1;fill-rule:nonzero;stroke:none" />
        </g>
        <path
           d="M 202.105,491.154 L 201.715,491.154 L 201.715,494.907 L 202.105,494.907 L 202.105,491.154 z M 201.291,491.33 L 200.899,491.33 L 200.899,494.79 L 201.291,494.79 L 201.291,491.33 z M
```

XML Tab Width: 8 Ln 1, Col 1 INS

Prepare JavaScript Event (cont'd)

- Format Inkscape generated SVG code
- Define `<linearGradient>` which contains 2 colors blue/yellow
- Added detailed-view layer
  - Pie chart
  - Initially set to hidden
  - Added placeholder for text

Prepare JavaScript Event (cont'd)

- Wrap a <g> around each <path>
- Insert `id` attribute to `<g> & <path>`
- Hook <g> `onclick`() event to event handler

Prepare JavaScript Event (cont'd)

- On slider click
  - Replace color-fill with gradient-fill
  - Calculate the offset of the gradient
- On building click
  - Set detailed-view to visible
  - Calculate the percentage and coordinates to draw pie chart

Demo

- http://antux.net/project/map.data.svg

Future Direction

- More Visualizations
- Animation
- Data-on-the-fly instead of pre-fetch
- 3-D likeliness
- Improve user-friendliness

Thank You!!!