

# Data Visualization

## HealthCare Application

New Bee

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# Introduction

- **Purpose of the application**

- Information visualization
- Trend in diabetes
- Predictive analysis
- Correlate trends in diabetes

- **Project Accomplishments**

- Comprehended data set
- Data clean-up
- Suitable visualizations.

# Introduction

- **Users**

- Doctors
- Analytical people
- Common man

- **Data related work**

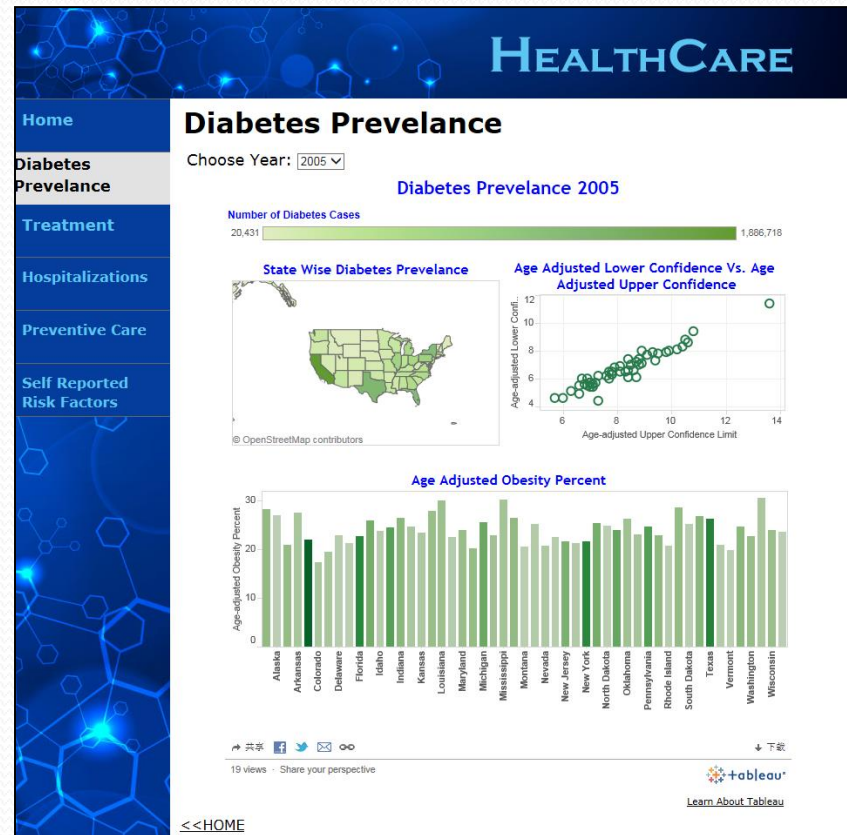
- Obtained from Centers for **Disease Control and Prevention** (CDC)
- Diabetes patients
- Multiple years data
- Across all states of the US



<http://www.cdc.gov/>

# Introduction

- Tools used
  - HTML and JavaScript
  - Apache Tomcat Server
  - NetBeans IDE 8.0.1
  - Dreamweaver CS8
  - Tableau



# Outlines in visualization

- **Diabetes Prevalence**

- shows the relationship among number of people diagnosed as diabetic, their adjusted ages and corresponding obesity percentage, within each geographic location for several years.

- **Hospitalization**

- shows the comparison of the number of discharges and the length of stay in the hospital for people diagnosed diabetic, as a first listed diagnosis or any listed diagnosis, across several years.

# Outlines in visualization

- **Treatment**

- Shows the percentage of adults within diabetes by diabetes medication status, across several years.

- **Self Reported Risk Factor**

- Shows trend pertaining to risk factors in diabetic patients.

- **Preventive Care**

- Suggests the trend in people (as percentage) who took different preventive actions, and were also diagnosed diabetic.

# Data Visualization

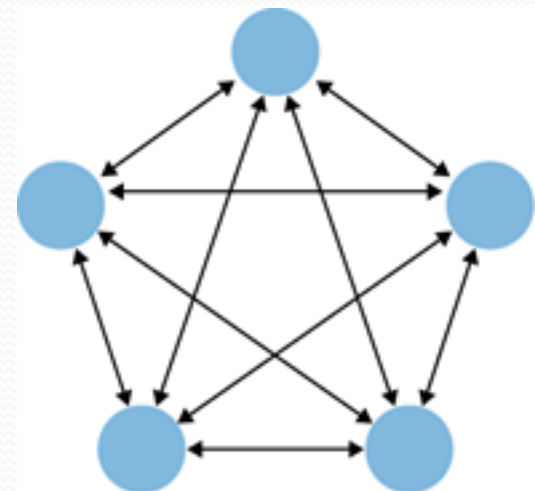
- **Design pattern**

- **Organization: Multiple workspaces**

Users may want to view different graphs and trends in the application.

- **Navigation: Fully connected**

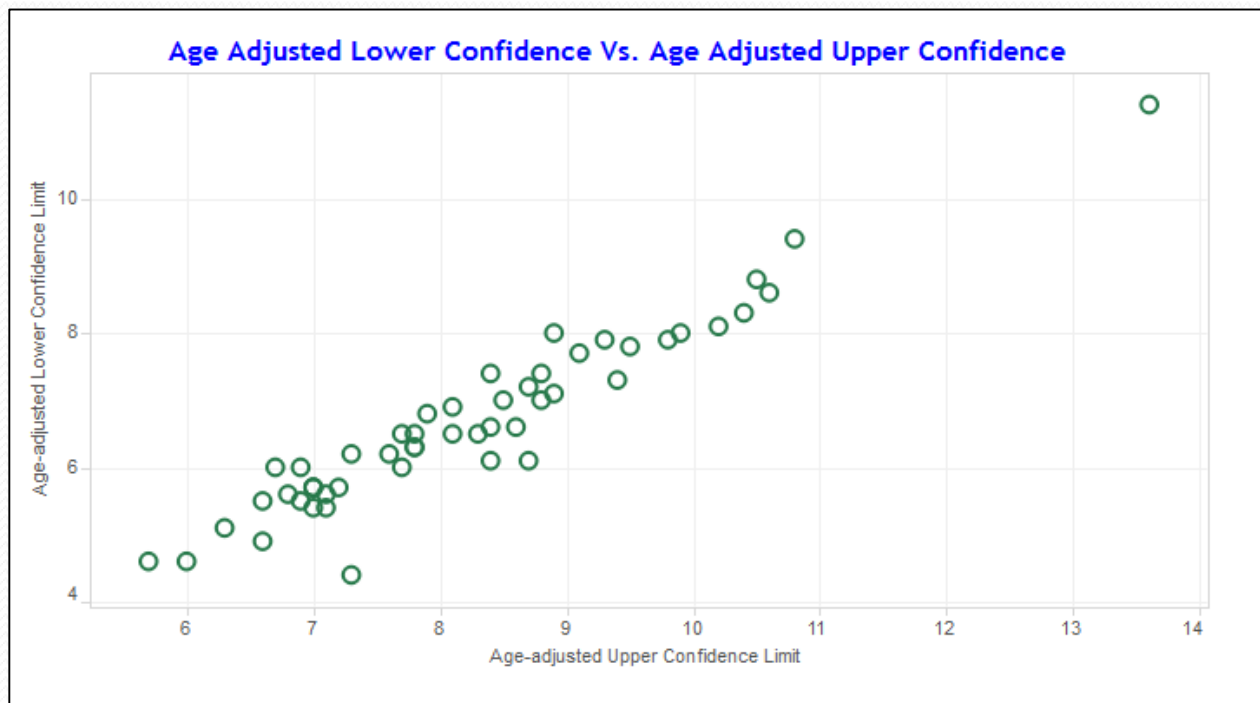
Allows the users to navigate between pages and also return to the home page from each page.



# Data Visualization

## Design Principles

- Scatter plot 

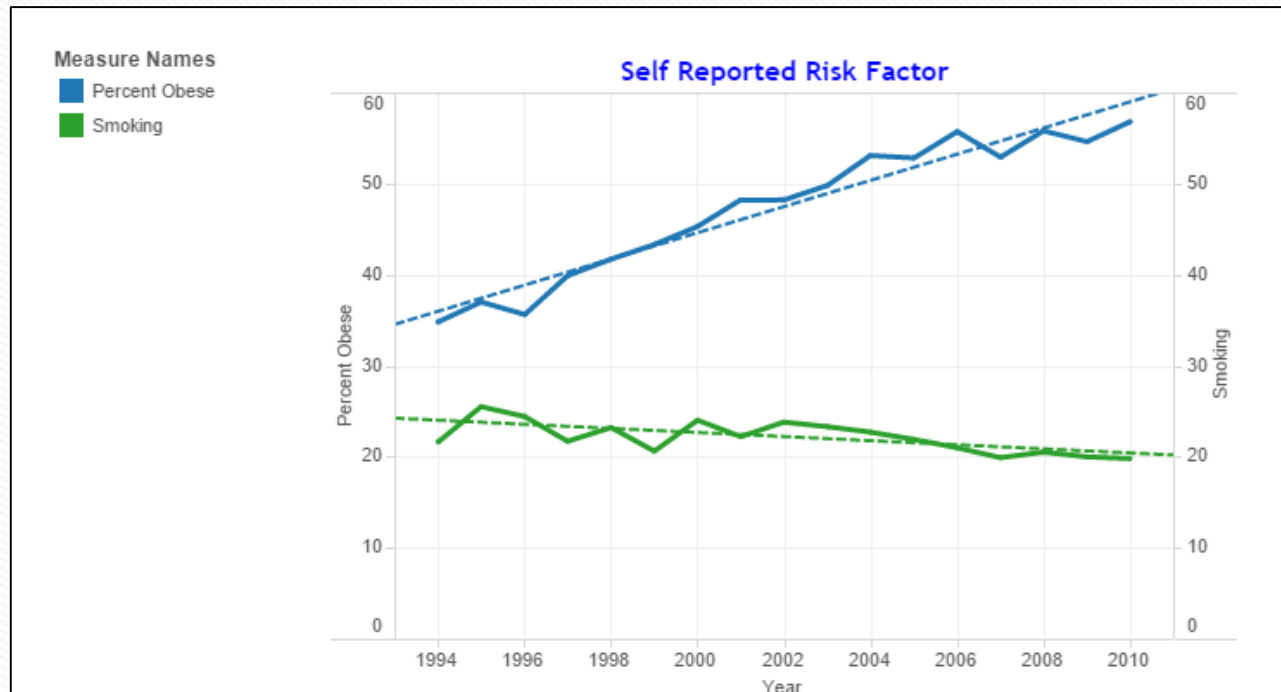




# Data Visualization

## Design Principles

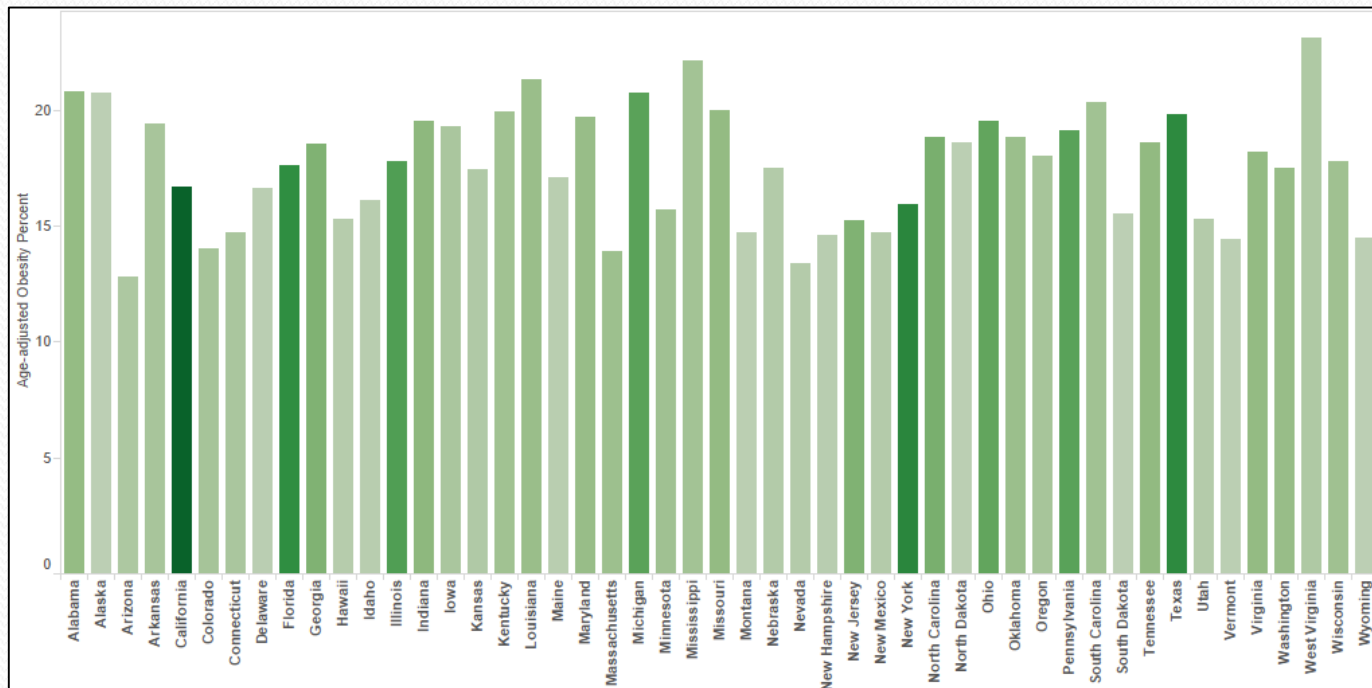
- Line graph (Trend Lines +) 



# Data Visualization

## Design Principles

- Bar chart 




# Data Visualization

## Design Principles

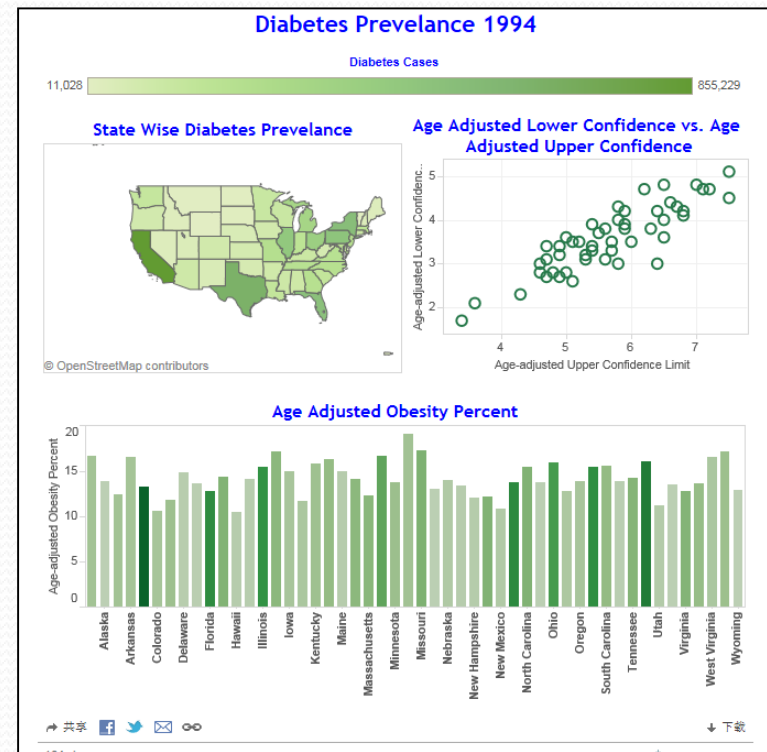
- US map 



# Web Application

- **Dashboard** 
- Shneiderman's Mantra
- Overall structure
- Details
- **Note!**

not refreshed on a daily basis,  
as a typical dashboard is  
intended to do.



# Analytical Interactions

- **Comparison**

- An effective data analysis is to allow comparisons.
- The dataset chosen for this project had data for different years and comparison of data among years and state was thought suitable.

- **Sorting**

- The visualization graphs are allowed to be sorted to analyze the same data in different perspectives.

# Analytical Interactions

- **Filtering**

- The filtering option is provided for users to choose specific years of data.
- Users can choose year and obtain data and trend corresponding to that year.

- **Highlighting**

- Brushing – Highlight the same data in multiple graphs
- Data Spot light – Highlight selected and dim the rest

# Analytical Interactions

- **Zooming and Panning**

- In the overall display of dashboards, the map is displayed as a small object.
- If the user wants to zoom to look for states in the east coast, the user would be able to do that by zooming and panning across the maps.

- **Data Tips**

- Users can get more information by hovering over the mouse.
- A tool tip with more information regarding the data will be displayed to the user.
- This feature would aid the user to understand and analyze more data and to further drill down to the atomic level.

# Setup and Run

- I. **Unzip original project zip file**
- II. **Open NetBeans IDE, click “File” in tool bar and open original project folder.**
- III. **If there is a warning of “Missing Java EE Server” under “Libraries”, right click on project “HealthCare” and click “Resolve Missing Server Problem” to configure a server which is indispensable to support tableau API.**
- IV. **Right click on project “HealthCare” and click “Run” to run this web application on local server.**



# DEMO

- **Web Application: HealthCare**



# References

- [1] <http://www.tableausoftware.com/new-features/javascript-api>, Accessed on Nov 30, 2014.
- [2] <http://www.tableausoftware.com/public/>, Accessed on Nov 15, 2014.
- [3] <http://www.cdc.gov/diabetes/data/national.html>, Accessed on Nov 15, 2014.
- [4] Ben Shneiderman, The Eyes Have It: A Task by Data Type Taxonomy for Information Visualizations. In Proceedings of the IEEE Symposium on Visual Languages, pages 336-343, Washington. IEEE Computer Society Press, 1996.  
<http://citeseer.ist.psu.edu/409647.html>