

# Deconstructing and Constructing Graphics

## Data Computing

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### Janet L. Yellen, on the Economy's Twists and Turns

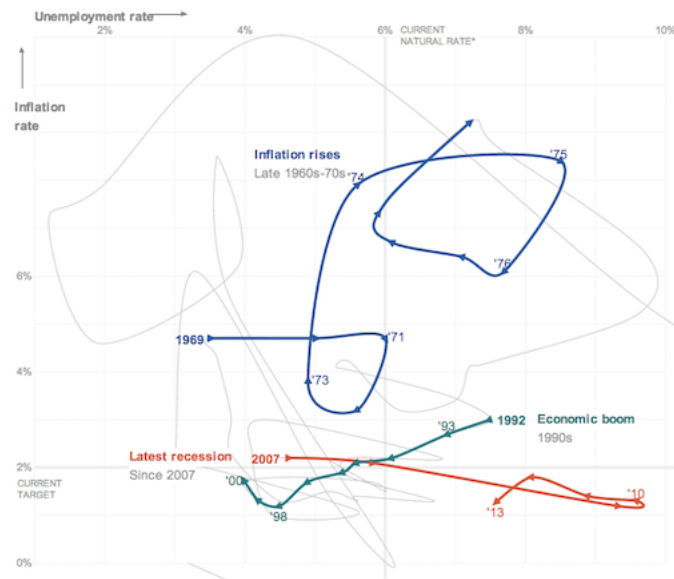
1 2 3 4 5 6 7

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#### Inflation and unemployment

The Federal Reserve is said to have a "dual mandate": keeping inflation in check and the unemployment rate low. These measures, which tend to change cyclically and in concert with each other, are charted for every year since the Great Depression.

In speeches and in meetings, Ms. Yellen, the nominee for the next Fed leader, has commented on the Fed's actions during significant periods, providing a window into her views and priorities.



\*The natural rate of unemployment is defined as the lowest sustainable level of unemployment over the long term. If the rate is pushed any lower than the natural level, wages and prices would rise.

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## Breaking down the Chart

1. What variables form the frame?
2. What (if any) variables are used for faceting?
3. What are the glyphs?  
(If there's more than one type of glyph, pick one type that seems important.)
  - a. What are the graphical attributes ("aesthetics") of the glyph?
    - i. ?
    - ii. ?
    - iii. ?
    - iv. ?
    - v. ?
    - vi. ?
  - b. For each of the glyph aesthetics, which variable sets the value? Add on to the answer in (a).
4. What guides/scales are displayed? Check off the relevant entries in your list of aesthetics.
5. What annotations are there?
6. What is the coordinate system? If more than one, describe each of them.

- a. ?
  - b. ?
  - c. ?
7. How many layers are there? If more than one, describe each of them.
- a. ?
  - b. ?
  - c. ?
8. For each of the variables that appears in the graph, write down a couple of typical values. Indicate whether the variable is quantitative or categorical.
- a. ?
  - b. ?
  - c. ?
  - d. ?
  - e. ?
  - f. ?
9. For categorical variables, say whether the ordering (topology) is helpful. If not, suggest a better criterion for ordering.
- a. ?
  - b. ?
  - c. ?

## Constructing the Chart

Consider three different grammar components of the graph:

1. Frame
2. Glyphs, known as *geoms* in `ggplot2`.
3. Facets

There must always be a frame and at least one glyph layer in a (non-empty) chart.

Write down an appropriate `ggplot2` statement for generating each component. Say what aesthetics apply to each layer. (Any layer can inherit aesthetics from the frame, or can override them.) Take `TheData` to be a data frame containing relevant variables. If other dataframes are needed, call them `Data1`, `Data2`, etc.

1. Frame: `ggplot( data = TheData, ? )`
2. Layer 1:
3. Layer 2:
4. Layer 3:
5. Faceting:

Write down an appropriate command to construct the graph (or something like it). As a reminder, here are a few of the `ggplot2` functions:

```
ggplot(), geom_point(), geom_barchart(), geom_blank(), geom_boxplot(), geom_density(),  
geom_errorbar(), geom_polygon(), geom_line(), geom_path(), geom_ribbon(), geom_rug(),  
geom_text(), scale_y_log10(), scale_x_log10(), xlabel(), ylabel()
```

For other graphical types, e.g. dendrograms, networks, etc. and for non-rectangular coordinates, just say what you see without having to construct it.