

flexdashboard for Prototyping and Profit : a gentle intro + tutorial

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Slides (pdf) @ bit.ly/klm-rladiesdallas-feb2021

I'm Kaelen!!!! (that's Abby)

- Data scientist/software dev on the microservices DS/DE team @ [Medidata Solutions](#)
- MS in Biostatistics
- Loves R, data, aliens, pets, and podcasts



Agenda

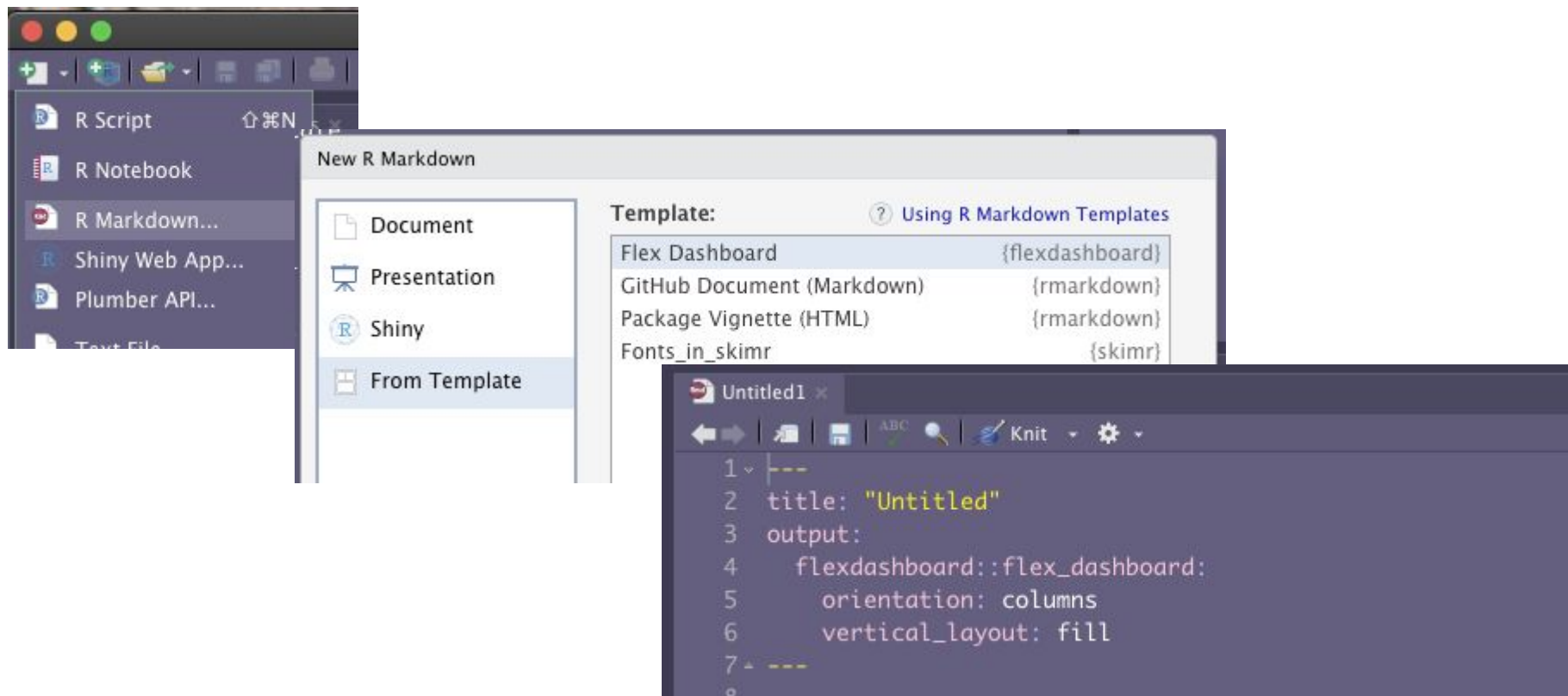
- flexdashboard basics
- flexdashboard for prototyping
- Building the flexdashboard together!
- flexdashboard for profit
- Extensions

flexdashboard basics

What is flexdashboard?

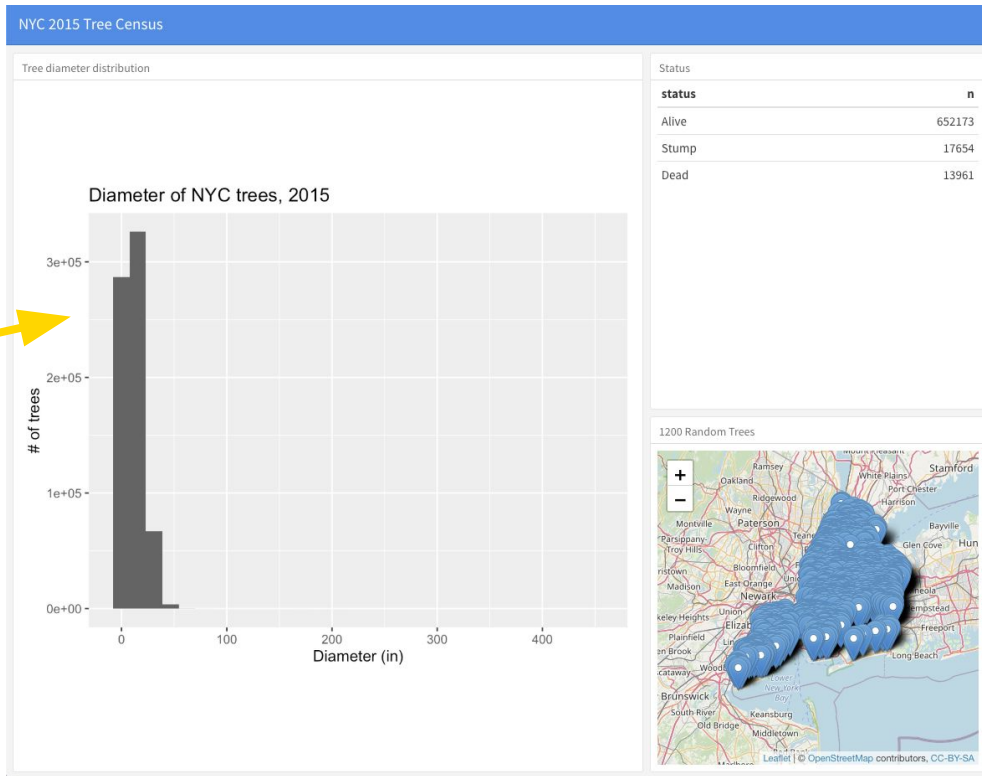
- An extension of RMarkdown that allows you to use a RMarkdown document to create an interactive dashboard
- Like many RStudio products (literally bless them 🙌) it has an amazing [website of documentation](#) that shows you:
 - How to set up a flexdashboard
 - Layouts
 - How to integrate Shiny
 - Example flexdashboards
- HTMLwidgets are supported!
 - Can use DT::datatable, Leaflet maps, Plotly plots, and more!

Creating a flexdashboard



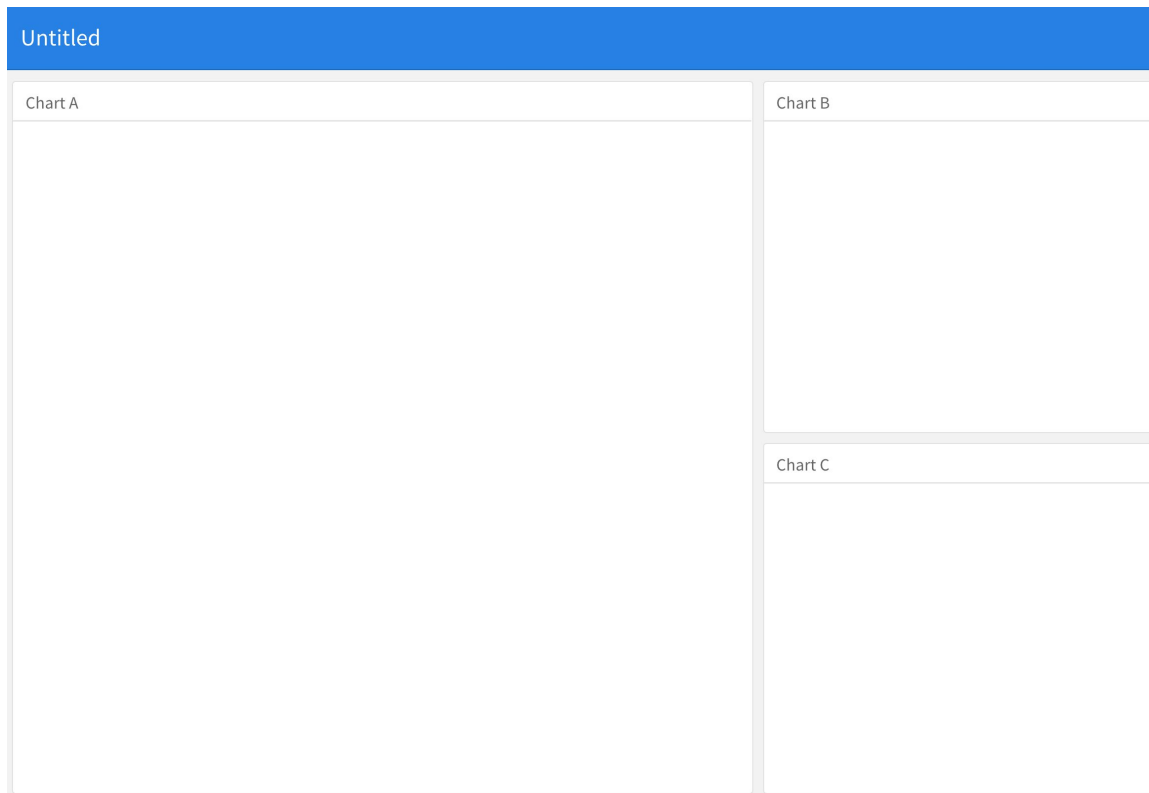
Write your RMarkdown document, then knit...

```
1. ---
2. title: "NYC 2015 Tree Census"
3. output:
4.   flexdashboard::flex_dashboard:
5.     orientation: columns
6.     vertical_layout: fill
7. ---
8.
9. ```{r setup, include=FALSE}
10. # libraries
11. library(Flexdashboard)
12. library(tidyverse)
13.
14. # load data
15. trees_2015 <- read_csv("new_york_tree_census_2015.csv")
16. ```
17.
18. Column {data-width=650}
19. -----
20.
21. ### Tree diameter distribution
22.
23. ```{r}
24. trees_2015 %>%
25.   ggplot(aes(tree_dbh)) +
26.   geom_histogram() +
27.   labs(title = "Diameter of NYC trees, 2015",
28.        x = "Diameter (in)",
29.        y = "# of trees")
30. ```
31.
32. Column {data-width=350}
33. -----
34.
35. ### Status
36.
37. ```{r}
38. trees_2015 %>%
39.   count(status, sort = TRUE) %>%
40.   knitr::kable()
41. ```
```



**flexdashboard for
prototyping + building the
dashboard**

By default, a flexdash looks like this:



I <3 open data

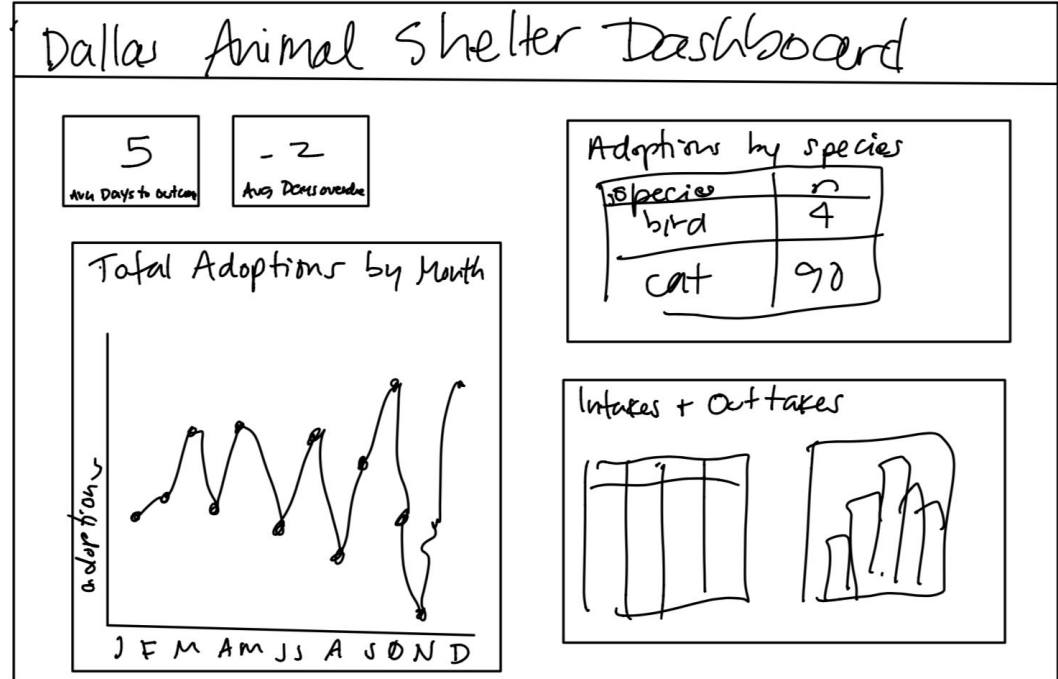
- Most (major? U.S.?) cities have an open data portal, Dallas included!
 - Want to be honest about my perspective as a U.S.-based NYC'er!
- [2020 Dallas Animal Shelter Data](#)
 - Available in CSV format!
- Let's build the Dallas Animal Shelters a dashboard to keep up with shelter activity!

Before we start building, some questions...

- Why is a dashboard appropriate for this data and stakeholder?
- What is the stakeholder looking to track in the dashboard, and do they have preferences about display?
 - Graphs vs. data tables
- Once you know what to track and visualization preferences, think about possibilities. What kinds of graphs or charts will be best for that metric/measure?

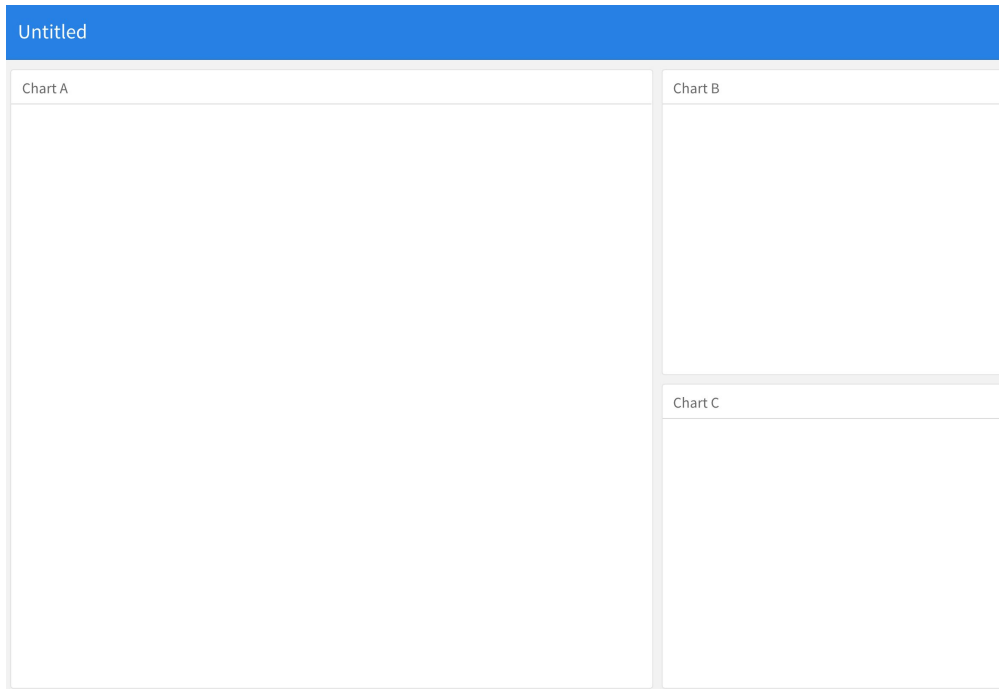
Draw a picture!

- I highly recommend drawing at least 1 picture of what your dashboard *could* look like before you start building!
 - You can even show these rough sketches to stakeholders and iterate before you start building, but proceed with caution!
- Here's my idea of a rough version of our animal shelter dashboard



Vo of the dashboard

- Let's build it together, starting with the default flexdashboard layout (shown at right)
- I've pre-calculated some metrics and created some graphs for us already



Changes are straightforward...

- Add context and information for users the same way you add information in an RMarkdown document
 - Write text outside the code blocks
 - Can include links, images, anything usually available in Markdown
- Use `DT::datatable()` to make an interactive, searchable table
- Use `plotly::ggplotly()` to make an interactive plot
- Change the layout
 - The [documentation](#) provides a lot of example layouts

Vo.1 of the dashboard

- Maybe a layout change: Change to tabset columns on the right, with one “showcase” graphic on the left (in this case the map)
 - Changing the layout involves editing the row/column code that controls the layout, so:

```
Column {data-width=350}
```



```
Column {.tabset}
```

Vo.1 of the dashboard

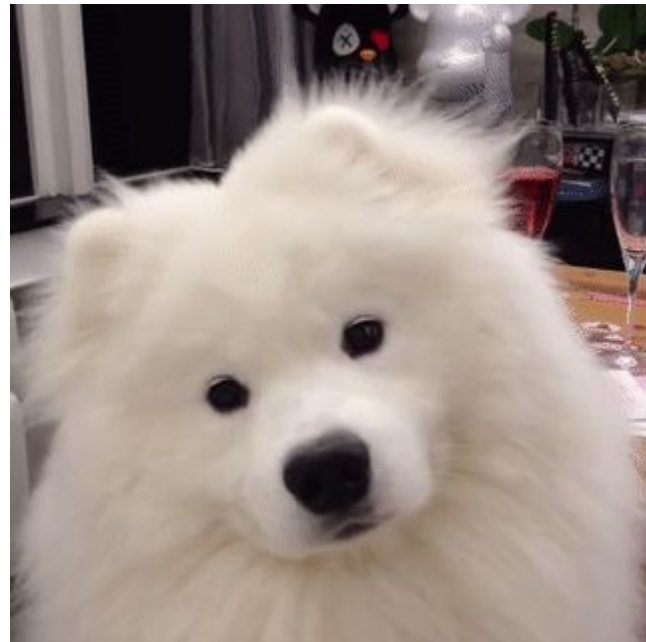
- TBD! - i'll update this during the session with what we create

Vo.2 of the dashboard

- TBD! - i'll update this during the session with what we create

And so on!

- This dashboard is getting unwieldy (and sort of ugly in my opinion) but you can keep iterating and adding things as the stakeholder desires
- In my experience, **stakeholders don't always know what they actually want**, especially when they don't make graphs for a living
 - **Flexdashboard can allow you to build and show new features to them quickly**



flexdashboard for profit

Profit???

- Probably some money, eventually
- But the best profit of all???? You know how to use another cool new thing in R
 - ~*~ the real profit is the stuff we learned along the way ~*~



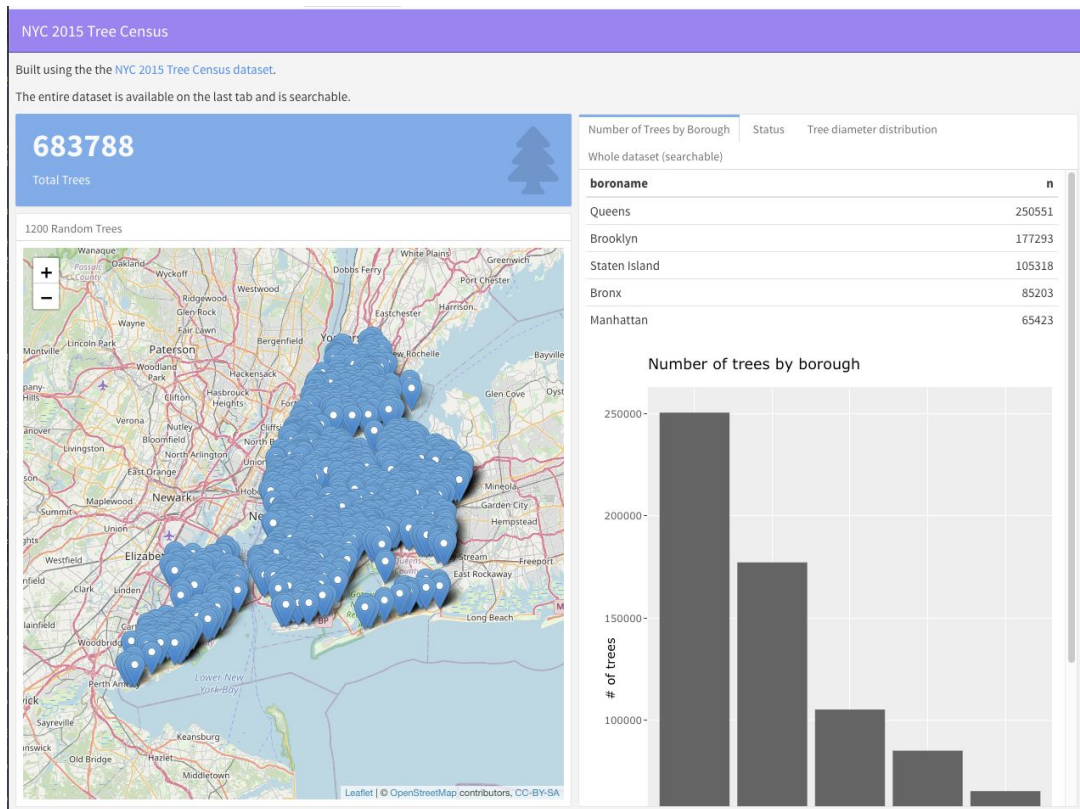
Extensions

flexdashboard and CSS

- Add custom styling to your flexdashboard using CSS

- Create a style.css text file
- Adjust the .navbar-inverse property to make it purple
- Add the css option to the yaml header

```
---
title: "NYC 2015 Tree Census"
output:
  flexdashboard::flex_dashboard:
    orientation: columns
    vertical_layout: fill
    css: style.css
---
```



flexdashboard and Shiny

- You can combine flexdashboard with more traditional Shiny code to make your dashboards even more advanced
 - Add inputs to help personalize outputs
 - Modularize
- More details in the flexdashboard [documentation](#)

When should I convert to a Shiny app?

- If your company has RStudio Shiny Server Pro
 - Why not?
- If you anticipate a high number of users (enterprise-scale), you may want an actual Shiny app
 - And will want to consider enterprise Shiny app needs, such as number of users at a given time.
 - This is another talk entirely!
- At any point when you start to feel like you have “too much code” for a flexdashboard alone
 - This is up to you, feel out the vibes
- As a fun, personal challenge
 - Follow your heart!

Deployment options

- Deploy on any of these if your company has them:
 - shinyapps.io
 - RStudio Shiny Server Pro
 - RStudio Connect
- For personal deploys:
 - shinyapps.io
 - Allows for native push-button deploy from RStudio!
 - Your own server with RStudio Shiny server installed on it
 - E.g. on an EC2 instance on AWS
- Google “deploy shiny app” + some key words about your situation and I guarantee you’ll find numerous resources!
 - Tutorials in blogs, videos, you name it!

Thank you!!

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Code and slides @

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*Very recent photo of me & grandpa
“painting”, circa 1990 or 1991*