

SINGLE-FAMILY HOMES AS PERCENT OF ALL HOMES

19%



PERCENT OF ALL HOMES OCCUPIED BY OWNERS

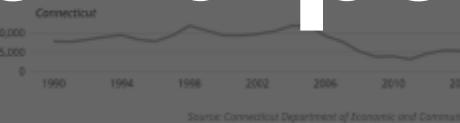
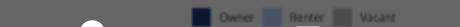
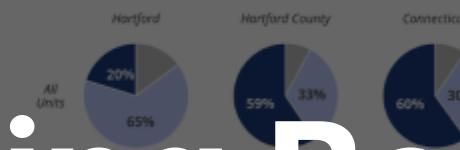
20%

Over 56% of Connecticut's occupied housing stock is comprised of single-family units. 65% of Hartford's occupied housing stock is owned by homeowners, while most multifamily units are occupied by renters.

In Hartford, 19% of occupied homes are single-family, and 81% are multifamily. Owners live in 64% of Hartford's 10,178 single-family homes, and renters live in 74% of its 43,680 multifamily homes.

Growth is slow in the state, which has seen a 42% decrease in building permits between 1990 and 2017.

In Hartford, there were 405 building permits issued in 1990, compared to 5 issued in 2017, representing a 99% decrease.



Source: Connecticut Department of Economic and Community Development

PEOPLE BURDENED BY COST OF HOUSING

50%

Households that are cost-burdened spend more than 30% of their income on housing. Severely cost-burdened spend more than 50% on housing.

RENTERS BURDENED BY COST OF HOUSING

59%

Housing cost burden for renters

32% 31% 29% 28% 27% 26% 25% 24% 23% 22% 21% 20% 19% 18% 17% 16% 15% 14% 13% 12% 11% 10% 9% 8% 7% 6% 5% 4% 3% 2% 1% 0% Hartford County Connecticut

Owners burdened by cost of housing

38%

Housing cost burden for owners

62% 61% 60% 59% 58% 57% 56% 55% 54% 53% 52% 51% 50% 49% 48% 47% 46% 45% 44% 43% 42% 41% 40% 39% 38% 37% 36% 35% 34% 33% 32% 31% 30% 29% 28% 27% 26% 25% 24% 23% 22% 21% 20% 19% 18% 17% 16% 15% 14% 13% 12% 11% 10% 9% 8% 7% 6% 5% 4% 3% 2% 1% 0% Hartford County Connecticut

RENTERS BURDENED BY COST OF HOUSING

30%

Housing costs as percent of income

Median income

30% \$38,818

19% \$48,954

21% \$53,500

12% \$75,686

\$0 \$50,000 \$100,000 \$150,000

Owners without Mortgage

Owners with Mortgage

All Owners

Renters

30% 29% 28% 27% 26% 25% 24% 23% 22% 21% 20% 19% 18% 17% 16% 15% 14% 13% 12% 11% 10% 9% 8% 7% 6% 5% 4% 3% 2% 1% 0% Hartford County Connecticut

OWNERS' HOUSING COSTS AS PERCENT OF INCOME

19%

Housing costs as percent of income

Median income

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\$0 \$50,000 \$100,000 \$150,000

Owners without Mortgage

Owners with Mortgage

All Owners

Renters

30% 29% 28% 27% 26% 25% 24% 23% 22% 21% 20% 19% 18% 17% 16% 15% 14% 13% 12% 11% 10% 9% 8% 7% 6% 5% 4% 3% 2% 1% 0% Hartford County Connecticut

Making Beautiful Reports that Communicate Effectively with pagedown and pagedreport

A Quick Story



This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see <http://rmarkdown.rstudio.com>.

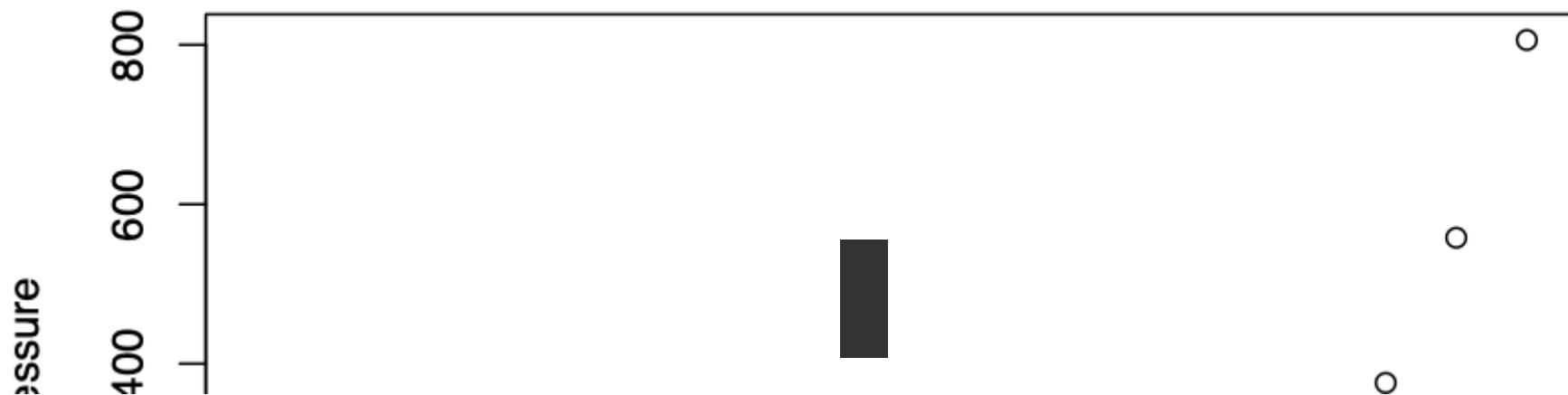
When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
summary(cars)
```

```
##      speed          dist
##  Min.   : 4.0   Min.   : 2.00
##  1st Qu.:12.0   1st Qu.: 26.00
##  Median :15.0   Median : 36.00
##  Mean    :15.4   Mean    : 42.98
##  3rd Qu.:19.0   3rd Qu.: 56.00
##  Max.    :25.0   Max.    :120.00
```

Including Plots

You can also embed plots, for example:



Report

David Keyes

1/5/2021

R Markdown

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Recognize This?

```
##      speed          dist
##  Min.   : 4.0   Min.   : 2.00
##  1st Qu.:12.0  1st Qu.: 26.00
##  Median :15.0  Median : 36.00
##  Mean    :15.4  Mean    : 42.98
##  3rd Qu.:19.0  3rd Qu.: 56.00
##  Max.   :25.0  Max.   :120.00
```

R Users Are Not Designers







Who runs the world?

A photograph of a red carpet event featuring several celebrities. In the foreground, a woman with short blonde hair and a sequined dress is speaking into a microphone. Next to her is a man wearing a green suit and a colorful patterned hat. Behind them are other well-dressed individuals, including a woman in a silver dress and another in a dark dress. The background shows a wall with a grid pattern.

PDFs Run the World

Who runs the world?

A still from the TV show 'The Office' featuring Michael Scott. He is wearing his signature blue button-down shirt, red suspenders, and patterned tie. He has his hands on his hips and is looking slightly to the right with a neutral expression. The background shows the office's hallway with cubicles and fluorescent lighting.

Yeah, I'm Gonna
Need That in a PDF

Options to Make PDF Reports



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```

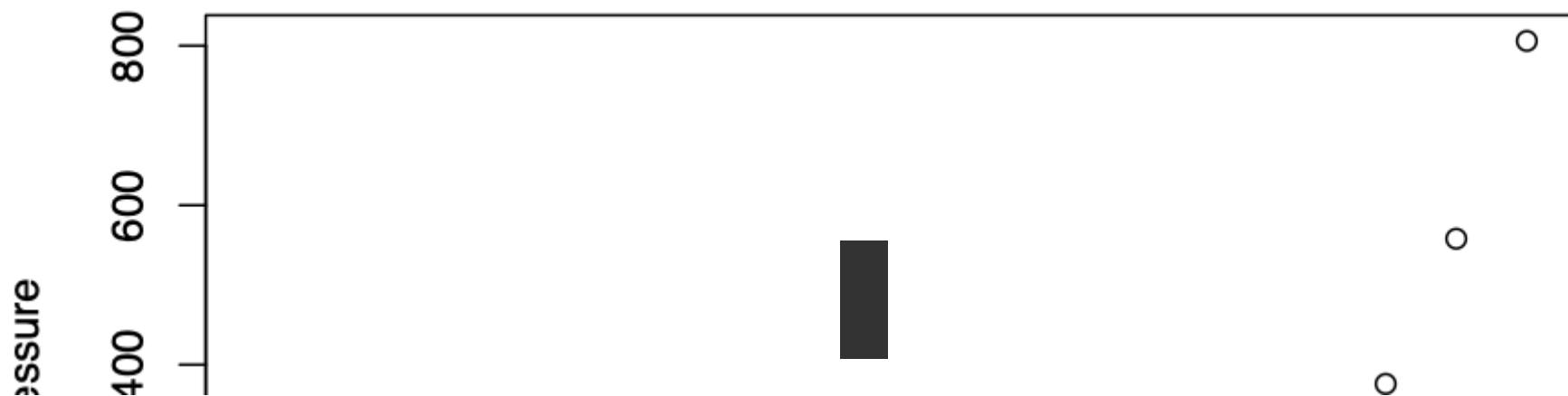
```
##      speed         dist
```

Option #1

Default PDF Format

Including Plots

You can also embed plots, for example:



Please Don't



Option #2

LaTeX





Andrew Heiss
@andrewheiss

▼

Which program gives the most obscure and maddeningly difficult-to-decipher logs and messages?





Andrew Heiss
@andrewheiss

Which program gives
maddeningly difficult

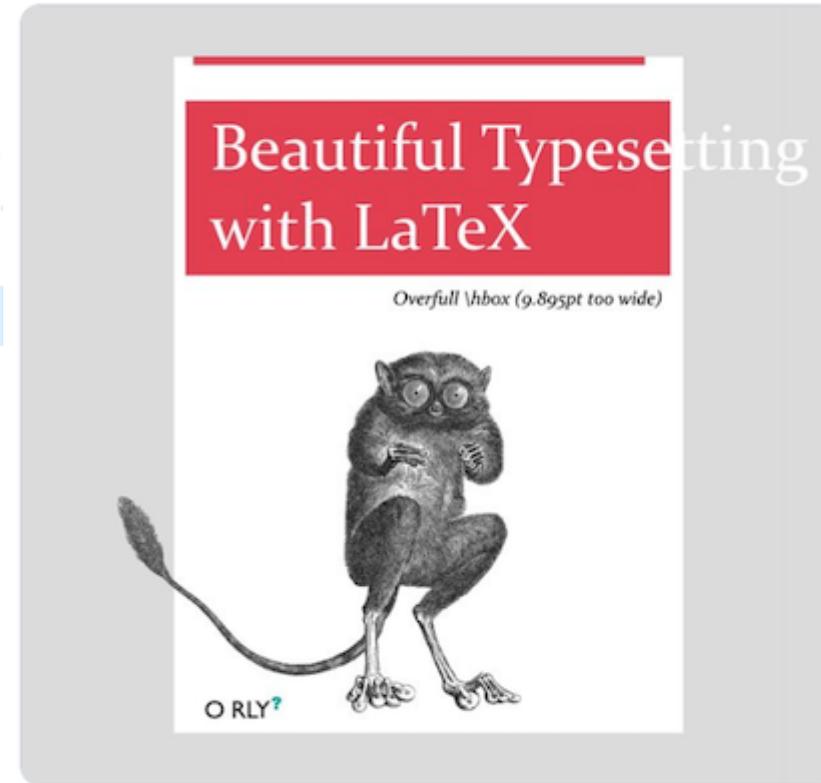
LaTeX

LaTeX



Give to MSF if you can
@thatommyhall

So nice to see this in print at last



11:29 AM · Apr 10, 2020 · Twitter for Android



Andrew Heiss
@andrewheiss

Which program gives the most
maddeningly difficult-to-decipher
logos and messages?

LaTeX

LaTeX



Give to MSF if you can
@thattommyhall

So nice to see this in print at last



Matt Cowgill
@MattCowgill

making tables in LaTeX is enough to make me take back
every bad thing I ever said about Microsoft Office

9:21 PM · Apr 11, 2020 · [Twitter Web App](#)

11:29 AM · Apr 10, 2020 · Twitter for Android



Give to MSF if you can
@thattommyhall

So nice to see this in print at last



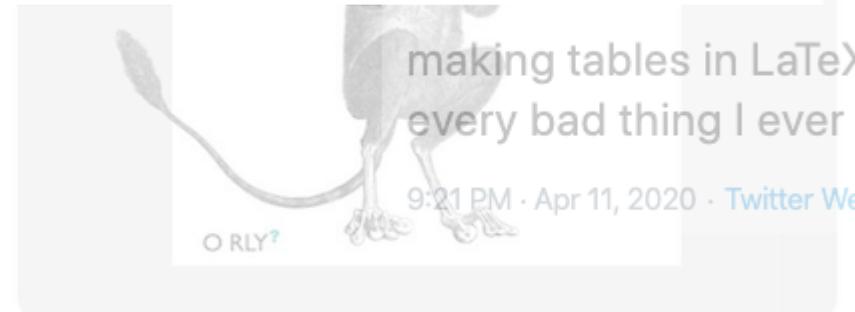
Andrew Heiss
@andrewheiss

Which program gives the most difficult-to-decipher error messages?
LaTeX



Jeff Littlejohn
@jefflittlejohn

Potential cause of death: troubleshooting Latex errors
from knitting rmarkdown. [#rstats](#)



9:21 PM · Apr 11, 2020 · Twitter Web App

11:29 AM · Apr 10, 2020 · Twitter for Android

Option #3 Work With a Designer





Is There
Another Option?

Yes!



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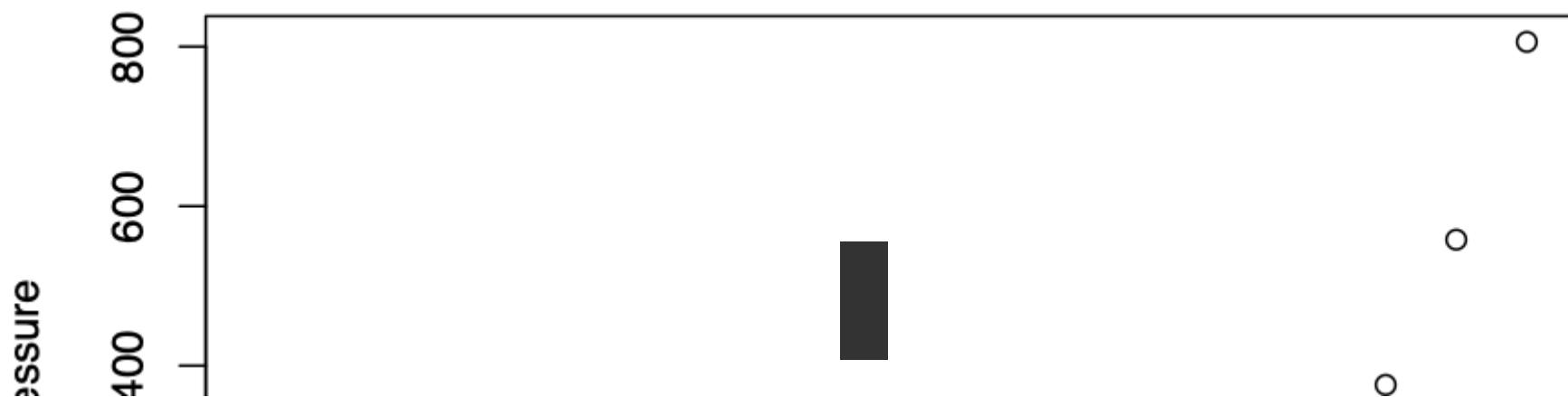
```
summary(cars)
```

How Did I Get From Here ...

```
##   Mean    :15.4    Mean    : 42.98
##   3rd Qu.:19.0    3rd Qu.: 56.00
##   Max.   :25.0    Max.   :120.00
```

Including Plots

You can also embed plots, for example:



HOUSING

2020 Housing Data Profiles

HARTFORD

AFFORDABILITY

2020 Housing Data Profiles

HARTFORD

POPULAT

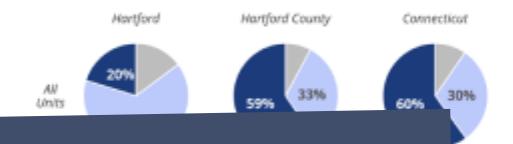
SINGLE-FAMILY HOMES AS PERCENT OF ALL HOMES

19%

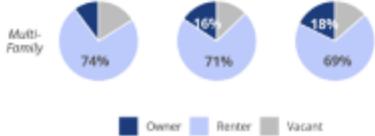


PERCENT OF ALL HOMES OCCUPIED BY OWNERS

20%



In Hartford, 19% of occupied homes are single-family, and 81% are multi-family. Owners live in 64% of Hartford's 10,178 single-family homes, and renters live in 74% of its 43,680 multifamily homes.



Owner Renter Vacant

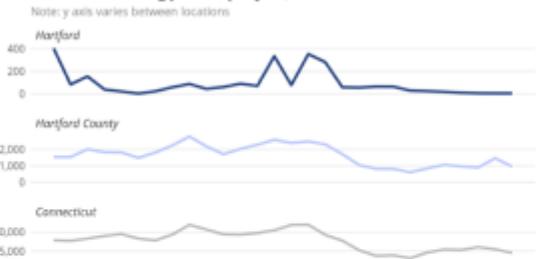
CHANGE IN BUILDING PERMITS, 1990-2017

-99%

Growth is slow in the state, which has seen a 42% decrease in building permits between 1990 and 2017.

In Hartford, there were 405 building permits issued in 1990, compared to 5 issued in 2017, representing a 99% decrease.

Number of building permits per year, 1990-2017



Source: Connecticut Department of Economic and Community Development



AFFORDABILITY

PEOPLE BURDENED BY COST OF HOUSING

50%

Households that are cost-burdened spend more than 30% of their income on housing. Severely cost-burdened spend more than 50% on housing.

RENTERS BURDENED BY COST OF HOUSING

59%

Housing cost burden for renters

	32%	22%	41%
Hartford	32%	22%	41%
Hartford County	25%	22%	47%
Connecticut	26%	23%	45%

OWNERS BURDENED BY COST OF HOUSING

38%

Housing cost burden for owners

	16%	21%	62%
Hartford	16%	21%	62%
Hartford County	10%	16%	73%
Connecticut	12%	17%	71%

Severe burden (50% or greater) Moderate burden (Between 30% and 50%) Not burdened (Less than 30%) Not computed

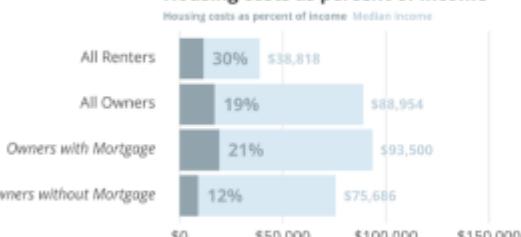
RENTERS' HOUSING COSTS AS PERCENT OF INCOME

30%

OWNERS' HOUSING COSTS AS PERCENT OF INCOME

19%

Housing costs as percent of income



TOTAL POPULATION
123,62

PEOPLE OF COLOR
85%

Connecticut population is increasingly diverse, population is becoming more diverse, municipalities, especially in Connecticut's cities, of residents are BIPOC, are white.

MEDIAN AGE
30

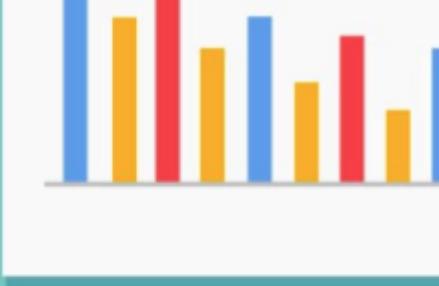
POPULATION CHANGE 2040
+0.3%

In the next twenty years, population is projected to grow from 126,443 to 126,846.



Client Needs 170+ Reports





R is Efficient ...

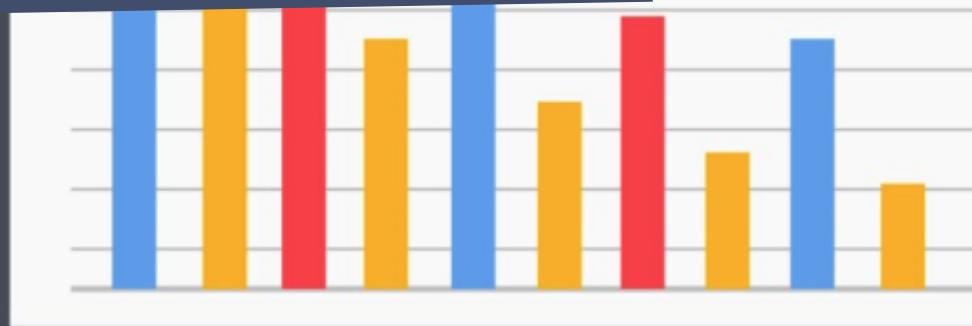


Illustration by MSSA/Shutterstock

Iterated fact sheets with R

A panoramic landscape of the Canadian Rockies at sunset. The sky is a deep blue, transitioning to orange and red near the horizon where the sun is setting behind a range of mountains. The mountains are rugged with dark, rocky faces and patches of snow. In the foreground, there is a large, calm lake with a turquoise color, reflecting the surrounding mountains. A dense forest of green coniferous trees lines the shore of the lake. The overall scene is a classic example of natural beauty.

... But Can it Be Beautiful?

LIJIA YU

Currently searching for a PhD student position

Please note that this is a *real* resume, and I'm really looking for a PhD student position at the moment. I made this resume because Yihui asked me if I'd like to test the `pagedown` package with my resume. If you are interested in my background and skills, please feel free to contact me.

2010
B.S.
Biology
Tsinghua University

2014

Enter pagedown

RESEARCH EXPERIENCE

2011
Graduate Research Assistant
Beijing Institute of Genomics, Chinese Academy of Sciences
Beijing, China

- Performed computational biology research towards understanding regulation of alternative splicing in human and mouse transcriptome.
- Found EGFR pathway related mutations, aimed to understand the impacts of cancer mutations on EGFR signaling pathway.

2015
Bioinformatician
My Health Gene Technology Co., Ltd.
Beijing, China

- Investigated how cancer cells spread to other parts of the body at the single cell level.

2016
Visiting Scientist
University of Alabama at Birmingham
AL, USA

- Investigated the role of mitochondria in development of cancer.
- Investigated the evolution of genome architecture and its role in important evolutionary events.
- Detected thrombotic thrombocytopenic purpura related mutations in multiple patients' blood genome.

CONTACT INFO

lijia.yu@outlook.com
github.com/yulijia
+1 000-000-0000

For more information, please contact me via email.

SKILLS

Experienced in statistical analysis, statistical learning models, and optimization methods.

Full experience with next generation sequencing data analysis.

Highly skilled in R, Bash, Perl, Python, LaTeX

2014

PROFESSIONAL EXPERIENCE

Data Scientist, intern

SupStat Inc.
Beijing, China

- Taught R language to beginners.
- Wrote Shiny app demos.
- Converted statistical tutorials from SPSS to R language.

Bioinformatician

My Health Gene Technology Co., Ltd.
Beijing, China

- Analyzed whole-exome sequencing data.
- Wrote analysis pipelines of ChIP-seq, single cell DNA-seq and single cell RNA-seq.
- Studied tumor metastasis and wrote research reports.
- Also did case studies to identify the genetic defect causing rare disease.

2014

TEACHING EXPERIENCE

Introduction to R Language for Beginners.

Instructor of R and Data Mining Training Courses at SupStat Inc.
Beijing, China

Computational Biology and Bioinformatics.

Teaching assistant of GBS CB2-201 courses at UAB

AL, USA

2014

SELECTED PUBLICATIONS AND POSTERS

Genetic and epigenetic signals are found predictive to the distribution of intra-individual divergence of alternative splicing.

Poster for 2013 International Conference of Genomics
Qingdao, China

Yu L, Chen B, Zhang Z.

ESCRT-0 complex modulates Rbf mutant cell survival by regulating Rhomboid endosomal trafficking and EGFR signaling.

J Cell Sci. 2016 May 15;129(10):2075-84.

Sheng Z, Yu L, Zhang T, Pei X, Li X, Zhang Z and Du W.

HOUSING

2020 Housing Data Profiles

HARTFORD

AFFORDABILITY

2020 Housing Data Profiles

HARTFORD

POPULAT

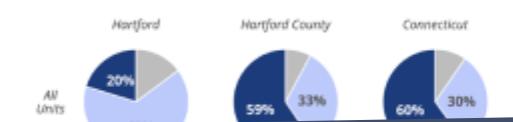
SINGLE-FAMILY HOMES AS PERCENT OF ALL HOMES

19%



PERCENT OF ALL HOMES OCCUPIED BY OWNERS

20%



Overall, 54% of Connecticut's

Connecticut Housing Reports

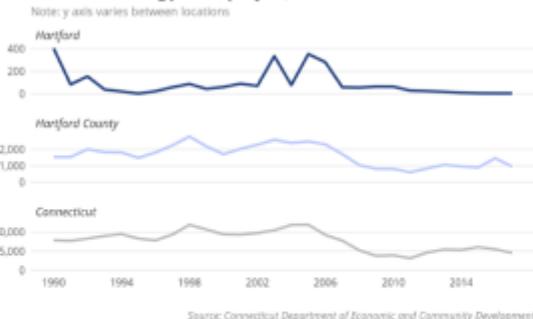
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Growth is slow in the state, which has seen a 42% decrease in building permits between 1990 and 2017.

In Hartford, there were 405 building permits issued in 1990, compared to 5 issued in 2017, representing a 99% decrease.

Number of building permits per year, 1990-2017



AFFORDABILITY

PEOPLE BURDENED BY COST OF HOUSING

50%

Households that are cost-burdened spend more than 30% of their income on housing. Severely cost-burdened spend more than 50% on housing.

2020 Housing Data Profiles

HARTFORD

2020 Housing Data Profiles

HARTFORD

TOTAL POPULATION

123,62

PEOPLE OF COLOR
85%

Connecticut population is increasingly diverse, with people of color making up a larger share of the population in municipalities, especially in Connecticut's cities. 85% of residents are BIPOC, and 75% are white.

COST OF

Housing cost burden for renters

Hartford	32%	22%	41%
Hartford County	25%	22%	47%
Connecticut	26%	23%	45%

COST OF

Housing cost burden for owners

Hartford	16%	21%	62%
Hartford County	10%	16%	73%
Connecticut	12%	17%	71%

Housing costs as percent of income



MEDIAN AGE
30

POPULATION CHANGE
2040
+0.3%

In the next twenty years, Connecticut's population is projected to grow by 0.3%, from 126,443 to 126,846.

RENTERS' HOUSING COSTS AS PERCENT OF INCOME

30%

OWNERS' HOUSING COSTS AS PERCENT OF INCOME

19%



R Code for the Plots





```
data_building_permits %>%
  filter(area_name %in% area_name_filter) %>%
  ggplot(aes(x = year, y = nb_building_permits, color = area_name)) +
  geom_line(size = 1.1) +
  scale_x_continuous(name = "", breaks = seq(1990, 2017, 4)) +
  scale_y_continuous(name = "# building permits",
                     labels = label_comma(accuracy = 1),
                     breaks = pretty_breaks(n = 3)) +
  scale_color_manual(name = "",
                     values = psc_colors("blue", "blue3", "grey2")) +
  guides(color = FALSE) +
  facet_wrap(vars(area_name),
             scales = "free_y",
             ncol = 1) +
  expand_limits(y = 0) +
  labs(title = "Number of building permits per year, 1990-2017",
       subtitle = "Note: y axis varies between locations",
       caption = "Source: Connecticut Department of Economic and Community Development") +
  theme_psc() +
  theme(
    panel.grid.major.y = element_line(),
    legend.position = "bottom",
    axis.title.y = element_blank()
  )
```

HTML and CSS for the Layout





```
:::{.wrap-columns .psc-no-border}
:::columns-33

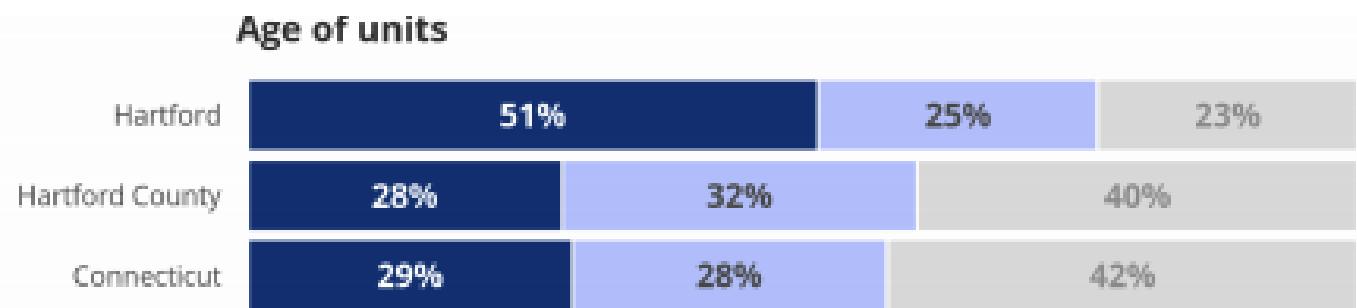
##### Units built before 1970

### `r df_key_stats_filter$perc_b1970`  
  
Older homes are prone to falling into disrepair, and often carry environmental risks such as lead paint. An aging housing stock can be a sign of poor housing quality.  
  
:::  
:::columns-67  
  
```{r year_built_dotplot, fig.height = 0.6}  
data_acs$year_built %>%
 filter(year_built_grp %in% c("Before 1950", "From 1950 to 1970") &
 area_level == "Town") %>%
 group_by(area_name) %>%
 summarize(perc_built = sum(perc_built)) %>%
 mutate(
 highlight_town = if_else(area_name == params$area_name, "Y", "N"),
 text_label = if_else(area_name == params$area_name, params$area_name, "")
) %>%
 dot_plot_comparing_towns("blue", var = perc_built, type = "percent") +
 scale_x_continuous(labels = percent_format(),
 limits = c(0, 1))
```
```



```
columns-33 {  
  flex: 33%;  
  padding-right: 20pt;  
}  
  
.columns-67 {  
  flex: 67%;  
  padding-left: 20pt;  
  padding-top: 10pt;  
  align-items: center;  
}
```

Older homes are prone to falling into disrepair, and often carry environmental risks such as lead paint. An aging housing stock can be a sign of poor housing quality.



The Result



```
:::  
:::columns-67  
```{r single_family_dotplot, fig.height=0.8}  
types_of_units %>%
 filter(units_structure_grp == "Single-Family") %>%
 dot_plot_comparing_towns("blue", var = perc_estimate, type = "percent")
...
:::
:::
:::{.wrap-columns nsc=border-top}
```

```
:::columns-3
```{r units_structures_percent, fig.height=0.8}  
df_text_units %>%  
  filter(area_name == "Connecticut") %>%  
  group_by(units_structure_grp) %>%  
  mutate(percent = sum(estimate))  
...  
#### Percent  
## `r df_text_units %>% select(-perc_owner)
```

Here's the Thing: It's Complicated

Overall, `r types_of_units %>% filter(area_name == "Connecticut" & units_structure_grp == "Single-Family") %>% pull(percent)` of Connecticut's occupied housing stock is comprised of single-family housing, while `r types_of_units %>% filter(area_name == "Connecticut" & units_structure_grp == "Multifamily") %>% pull(percent)` is multifamily housing (2+ units in structure). Most single-family homes are occupied by homeowners, while most multifamily units are occupied by renters.

In `r params\$area_name`, `r types_of_units_text %>% filter(units_structure_grp == "Single-Family") %>% pull(percent)` of occupied homes are single-family, and `r types_of_units_text %>% filter(units_structure_grp == "Multifamily") %>% pull(percent)` are multi-family. Owners live in `r df_text_units %>% filter(units_structure_grp == "Single-Family" & occupancy_status == "Owner") %>% pull(perc)` of `r params\$area_name`'s `r types_of_units_text %>% filter(units_structure_grp == "Single-Family") %>% pull(estimate)` %>% comma(accuracy = 1)` single-family homes, and renters live in `r df_text_units %>% filter(units_structure_grp == "Multifamily" & occupancy_status == "Renter") %>% pull(perc)` of its `r types_of_units_text %>% filter(units_structure_grp == "Multifamily") %>% pull(estimate)` %>% comma(accuracy = 1)` multifamily homes.

```
:::  
:::columns-67  
```{r units_structure_pie, fig.height=1.75, fig.width = 6}  
computation
visualization
```



# I Tried Teaching Others



**It Didn't  
Go Well**



# Can We Make Something Beautiful ...

A silhouette of a person standing on a dark, irregular shape, possibly a rock or a hill, with their arms raised wide in a gesture of triumph or freedom. The background is a gradient sky transitioning from purple at the top to orange and yellow at the bottom, suggesting a sunset or sunrise.

... and Easy to Use?

# Enter pagedreport



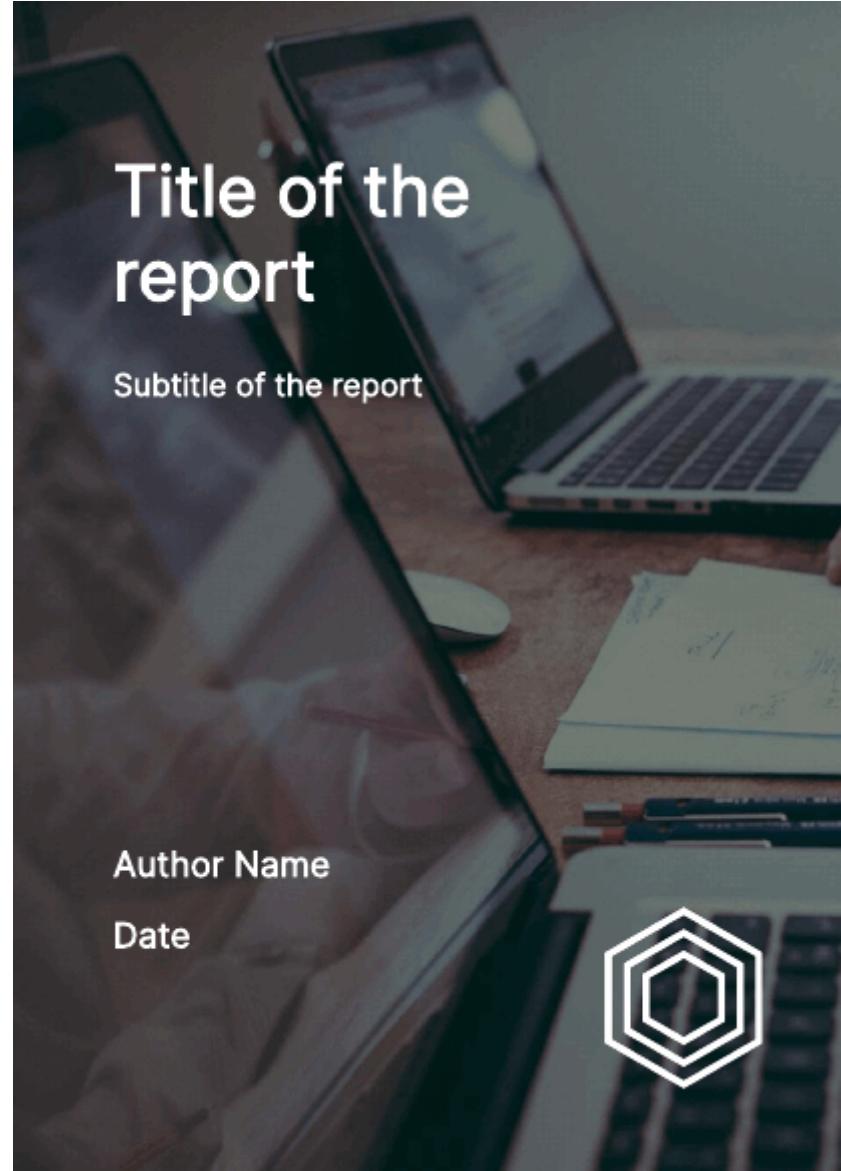
# Windmill

Title of the report

Subtitle of the report

Author Name

Date



# Grid



Date

## Title of the report

Subtitle of the report

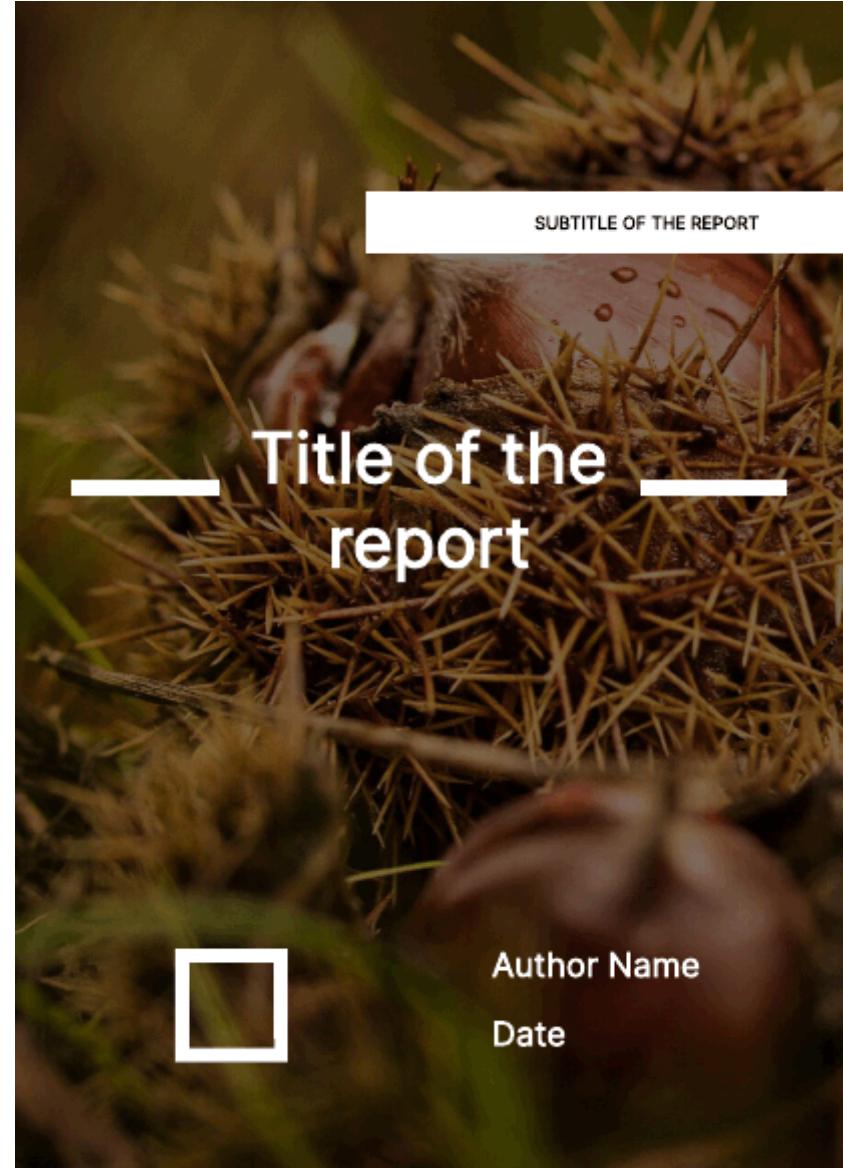
Author Name

# Hazelnuts

— Title of the  
report —

SUBTITLE OF THE REPORT

Author Name  
Date





**It's YAML All the Way Down**

```

```

```
title: "Title of the report"
subtitle: "Subtitle of the report"
author: "Author Name"
date: "Date"
output:
 pagedreport::paged_windmill:
 logo: "https://mk0rfortherest0o08q.kinstacdn.com/wp-content/uploads/2020/08/rru-logo-blu
 img_to_dark: FALSE
 logo_to_white: TRUE
knit: pagedown::chrome_print
main-color: "#6cabdd"

```

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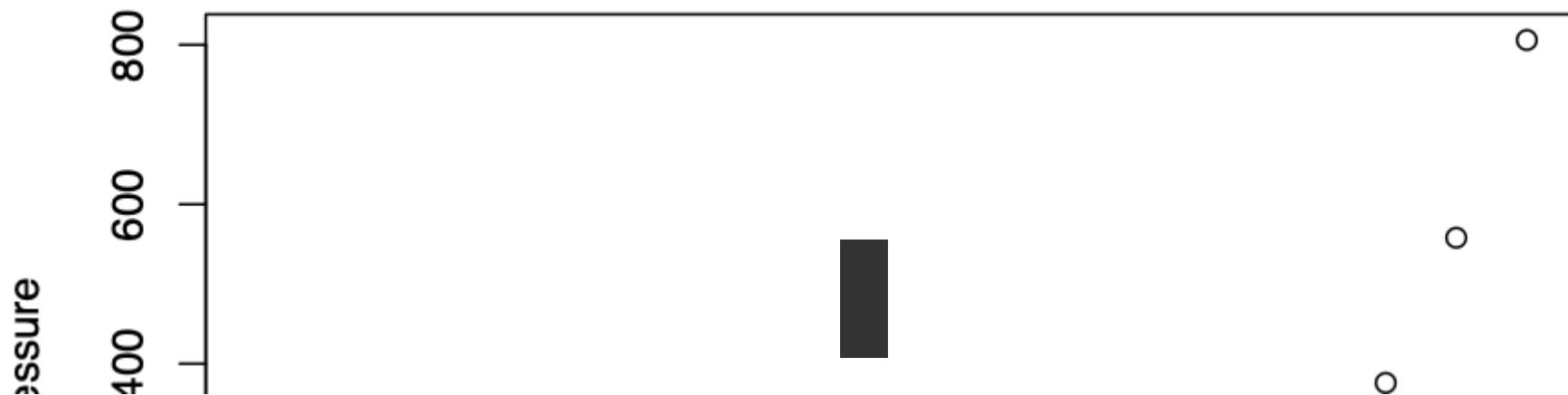
```
summary(cars)
```

```
##
```

# Please, Don't Make Ugly PDF Reports

## Including Plots

You can also embed plots, for example:



Got HTML + CSS Skills  
and Want 100% Control?  
Try pagedown



Subtitle of the report

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Questions?

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