

# decksh

a little language for decks



Anthony Starks  
@ajstarks

*A language is any mechanism to express intent, and the input to many programs can be viewed profitably as statements in a language. This column is about those “little languages.”*

Jon Bentley, Little Languages, Communications of the ACM, August 1986

# Deck



a Go package for presentations

# Elements



Structure



Text



Lists



Arrows



Images



Graphics



Charts



Loops



Data



Utility

decksh → deck markup

SVG  
PDF  
PNG

```
deck
  slide "rgb(250,250,250)" "black"
    ctext "Deck elements" 50 90 5
    image "follow.jpg" 70 50 640 480 50
    blist 10 75 3
      li "text, image, list"
      li "rect, ellipse, polygon"
      li "line, arc, curve"
    elist

    gy10
    rect 15 gy 8 6           "rgb(127,0,0)"
    ellipse 27.5 gy 8 6      "rgb(0,127,0)"
    line 50 gy 60 gy
    curve 80 gy 95 30 90 gy
    arc 70 gy 10 8 0 180 0.1 "rgb(0,0,127)"
    polygon "37 37 45" "13 7 10" "rgb(0,0,127)"

    opts="-fulldeck=f -textsize 1 - xlabel=2 -barwidth 1.5"
    dchart -left 10 -right 42 -top 42 -bottom 25 opts AAPL.d
  eslide
edeck
```

```
<deck>
  <slide bg="rgb(250,250,250)" fg="black">
    <text align="c" xp="50" yp="90" sp="5">Deck elements</text>
    <image name="follow.jpg" xp="70" yp="50" width="640" height="480" scale="50" />
    <list type="bullet" xp="10" yp="75" sp="3">
      <li>text, image, list</li>
      <li>rect, ellipse, polygon</li>
      <li>line, arc, curve</li>
    </list>
    <rect xp="15" yp="10" wp="8" hp="6" color="rgb(127,0,0)" />
    <ellipse xp="27.5" yp="10" wp="8" hp="6" color="rgb(0,127,0)" />
    <line xp1="50" yp1="10" xp2="60" yp2="10" />
    <curve xp1="80" yp1="10" xp2="95" yp2="30" xp3="90" yp3="10" />
    <arc xp="70" yp="10" wp="10" hp="8" a1="0" a2="180" sp="0.1" color="rgb(0,0,127)" />
    <polygon xc="37 37 45" yc="13 7 10" color="rgb(0,0,127)" />
    <text xp="26.00" yp="45.60" sp="1.50" align="center" wp="0.00" font="sans" opacity="100.00" color="black" type="">AAPL Volume</text>
    <line xp1="10.00" yp1="25.00" xp2="10.00" yp2="37.46" sp="1.50" opacity="100.00" color="lightsteelblue" />
    <text xp="10.00" yp="38.46" sp="0.75" align="center" wp="0.00" font="sans" opacity="100.00" color="rgb(127,0,0)" type="">679.9</text>
    <text xp="10.00" yp="23.00" sp="0.80" align="center" wp="0.00" font="sans" opacity="100.00" color="rgb(75,75,75)" type="">2017-09-01</text>
    <line xp1="12.91" yp1="25.00" xp2="12.91" yp2="34.24" sp="1.50" opacity="100.00" color="lightsteelblue" />
    <text xp="12.91" yp="35.24" sp="0.75" align="center" wp="0.00" font="sans" opacity="100.00" color="rgb(127,0,0)" type="">504.3</text>
    ...
  </slide>
</deck>
```

**Deck elements**

- text,image,list
- rect,ellipse,polygon
- line,arc,curve

AAPL Volume

Date	Volume
2017-09-01	679.9
2017-09-02	504.3
2017-09-03	492.1
2017-09-04	504.3
2017-09-05	504.3
2017-09-06	504.3
2017-09-07	504.3
2017-09-08	504.3
2017-09-09	504.3
2017-09-10	504.3
2017-09-11	504.3
2017-09-12	504.3
2017-09-13	504.3
2017-09-14	504.3
2017-09-15	504.3
2017-09-16	504.3
2017-09-17	504.3
2017-09-18	504.3
2017-09-19	504.3
2017-09-20	504.3
2017-09-21	504.3
2017-09-22	504.3
2017-09-23	504.3
2017-09-24	504.3
2017-09-25	504.3
2017-09-26	504.3
2017-09-27	504.3
2017-09-28	504.3
2017-09-29	504.3
2017-09-30	504.3

```
// hello world
deck
  slide "black" "white"
    ctext "hello, world" 50 25 10
    circle 50 0 100 "blue"
  eslide
edeck
```

# hello, world

# Running decksh

decksh

*read from stdin, write to stdout*

decksh in.dsh

*read from file, write to stdout*

decksh -o out.xml

*read from stdin, write to file*

decksh -o out.xml in.dsh

*read from file, write to file*

chmod +x in.dsh; ./in.dsh

*executable deck with #!/path/to/decksh*

decksh example.dsh | pdfdeck ...

hw.dsh - Visual Studio Code

File Edit Selection View Go Debug Terminal Help

hw.dsh x

```
// hello world
deck
    slide "black" "white"
        ctext "hello, world" 50 25 10
        circle 50 0 100 "blue"
    eslide
edeck
```

PROBLEMS TERMINAL ...

1: bash

```
$ decksh hw.dsh | pdf
$ open f.pdf
$
```

master\* 0 x 0 ▲ 0 Ln 8, Col 1 Tab Size: 4 UTF-8 LF Plain Text 😊 🔔



hw.dsh - Visual Studio Code

File Edit Selection View Go Debug Terminal Help

hw.dsh x

```
// hello world
deck
    slide "black" "white"
        ctext "hello, Mars" 50 25 10
        circle 50 0 100 "red"
    eslide
edeck
```

PROBLEMS TERMINAL ...

1: bash

```
$ decksh hw.dsh | pdf
$ open f.pdf
$ decksh hw.dsh | pdf
$
```

master\* 0 0 0 0 Ln 5, Col 29 Tab Size: 4 UTF-8 LF Plain Text 😊 🔔



# *Keywords and arguments*

**text** "string....." x y n [font][color][op]

text "hello, world" 80 50 2 hello, world

text "hello, world" 80 40 2 "serif" hello, world

text "hello, world" 80 30 2 "serif" "red" hello, world

text "hello, world" 80 20 2 "serif" "red" 50 hello, world

# *Keywords*

## **Structure    Text**

deck	text
edeck	ctext
slide	etext
eslide	rtext
canvas	textblock
include	textfile
	textcode

## **Lists**

list
blist
nlist
clist
li
elist

## **Graphics and Arrows**

rect	line	arrow
square	hline	crarrow
ellipse	vline	clarrow
circle	lbrace	cuarrow
polygon	rbrace	cdarrow
arc	ubrace	
curve	dbrace	

## **Images**

image
cimage

## **Charts**

dchart
legend

## **Loop**

for
efor

## **Data**

data
edata

## **Utility**

vmap	polarx
random	polary

# Variables and Assignments

```
x=10                                // number assignment  
y=20  
factor=2  
what="hello world"                   // string assignment  
  
size=x/factor                        // assignment with binop  
text what x y size                  // text "hello world" 10 20 5  
  
y-=10                               // assignment operation  
size+=factor                         // assignment op, substitute  
text what x y size                  // text "hello world" 10 10 7  
  
for v=0 100 5                        // loop from 0 to 100 by 5  
    line 100 v 0 v 0.1 "blue"        // blue horizontal lines  
    line v 100 v 0 0.1 "red"        // red vertical lines  
efor
```

# Text

hello world

text

*x y size [font] [color] [op] [link]*

hello world

ctext

*x y size [font] [color] [op] [link]*

hello world

etext

*x y size [font] [color] [op] [link]*

rotate  
angle  
path  
out  
name

rtext

*x y angle size [font] [color] [op] [link]*

# Text

## textblock

The quick brown fox  
jump over the lazy  
dog

## textfile

This is the contents  
of a file

"text" x y width size [font] [color] [op] [link]

"file" x y size [font] [color] [op] [sp]

## textcode

```
package main

import "fmt"

func main() {
    fmt.Println("hello, world")
}
```

"filename" x y width size [color]

# Lists

First thing

- First thing

- I. First thing

First thing

Second thing

- Second thing

2. Second thing

Second thing

Third thing

- Third thing

3. Third thing

Third thing

Fourth

- Fourth

4. Fourth

Fourth

list

blist

nlist

clist

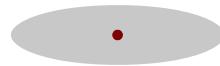
x y size [font] [color] [opacity] [spacing]

# Graphics



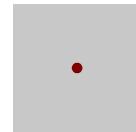
rect

`x y w h [color] [op]`



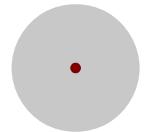
ellipse

`x y w h [color] [op]`



square

`x y w [color] [opacity]`



circle

`x y w [color] [op]`



polygon

`"xc" "yc" [color] [op]`



arc

`x y w h a1 a2 [lw] [color] [op]`



curve

`bx by cx cy ex ey [lw] [color] [op]`



hline

`x y len [lw] [color] [op]`



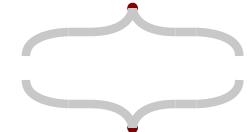
vline

`x y len [lw] [color] [op]`



[r-l]brace

`x y size aw ah [lw] [color] [op]`



[u-d]brace

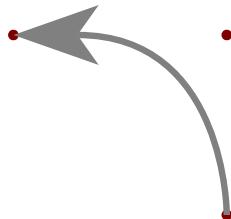
`x y size aw ah [lw] [color] [op]`

# Arrows



arrow

$x1 \ y1 \ x2 \ y2 \ [\text{linewidth}] \ [\text{aw}] \ [\text{ah}] \ [\text{color}] \ [\text{op}]$



lcarrow

$x1 \ y1 \ x2 \ y2 \ x3 \ y3 \ [\text{lw}] \ [\text{aw}] \ [\text{ah}] \ [\text{color}] \ [\text{op}]$



rarrow

...



ucarrow

...



darrow

...

# Images



image

"file" x y w h [scale] [link]

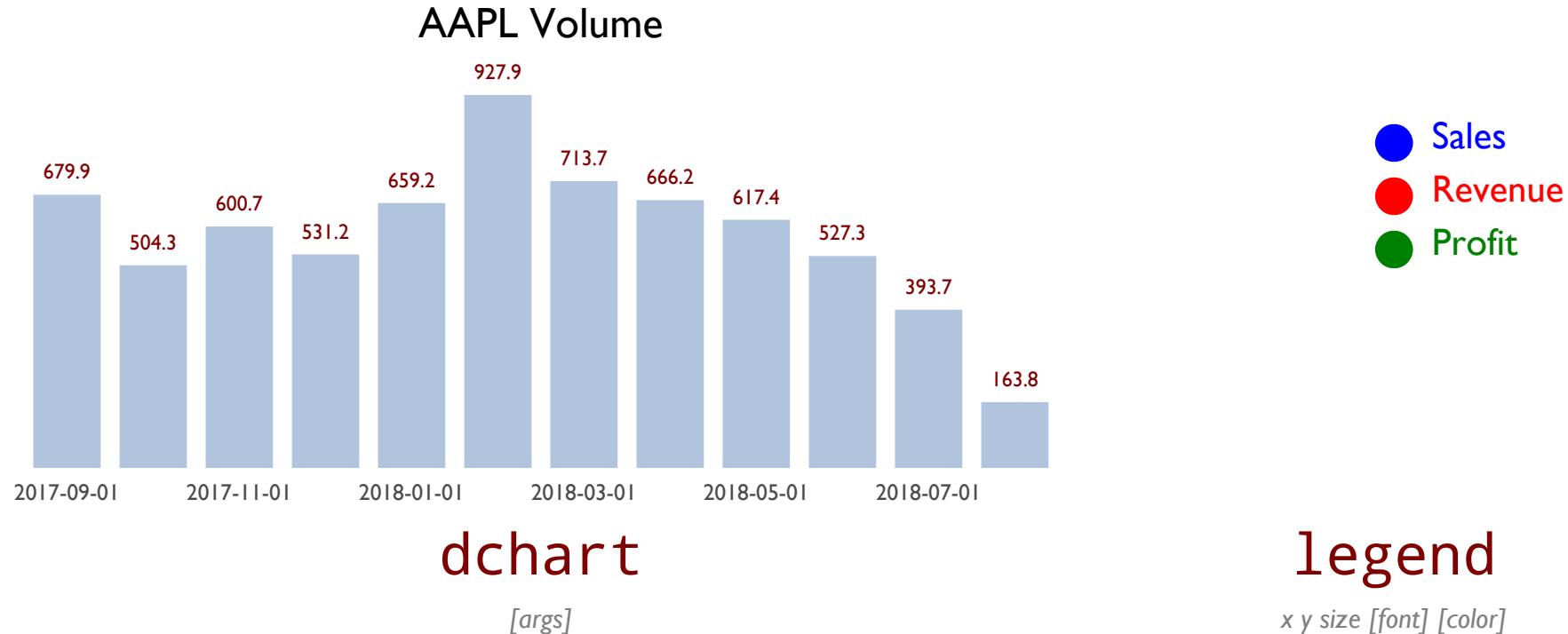


Up in the clouds

cimage

"file" "caption" x y w h [scale] [link]

# Charts



# *dchart* types



Column



Bar



Dot



Line



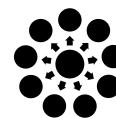
Scatter



Area



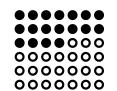
Donut/Pie



Radial

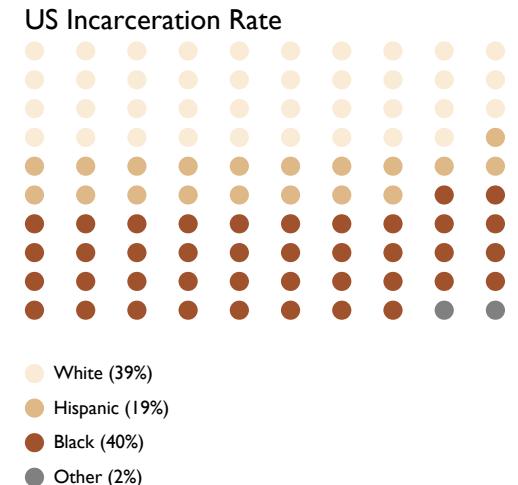
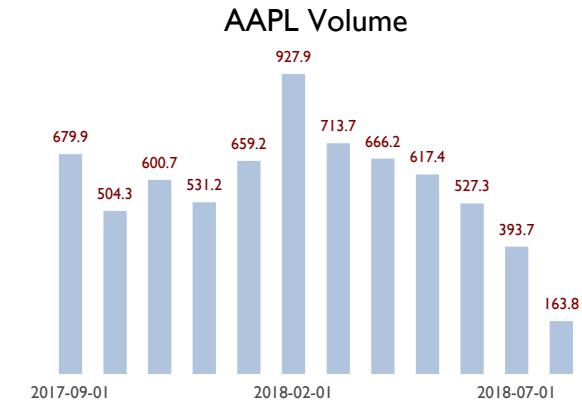
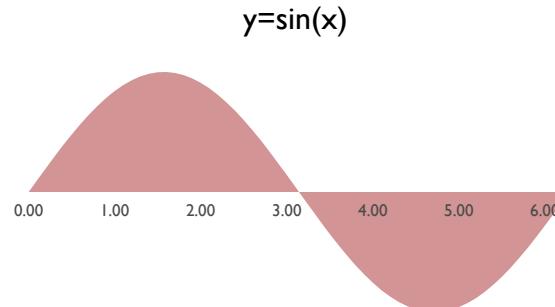
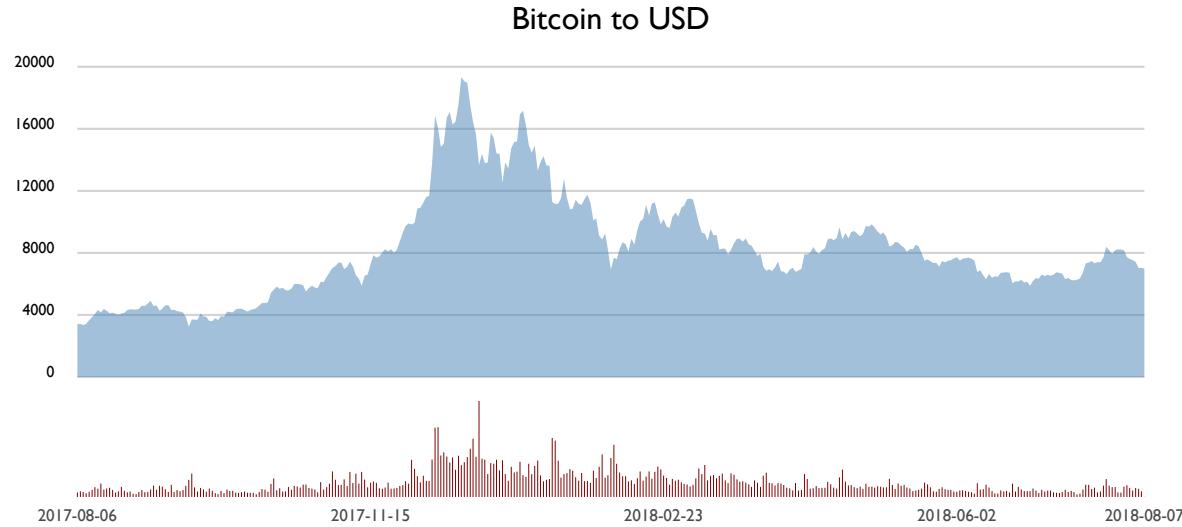


Pmap



Waffle

# *dchart: charts for deck*



```

deck
slide "rgb(250,250,250)" "black"
  ctext "Deck elements" 50 90 5
  image "follow.jpg"    70 50 640 480 50
  blist 10 75 3
    li "text, image, list"
    li "rect, ellipse, polygon"
    li "line, arc, curve"
  elist

  gy=10
  rect 15 gy 8 6           "rgb(127,0,0)"
  ellipse 27.5 gy 8 6      "rgb(0,127,0)"
  line 50 gy 60 gy
  curve 80 gy 95 30 90 gy
  arc 70 gy 10 8 0 180 0.1 "rgb(0,0,127)"
  polygon "37 37 45" "13 7 10" "rgb(0,0,127)"

  opts="-fulldeck=f -textsize 1 -xlabel=2 -barwidth 1.5"
  dchart -left 10 -right 42 -top 42 -bottom 25 opts AAPL.d
eslide
edeck

```

## Deck elements

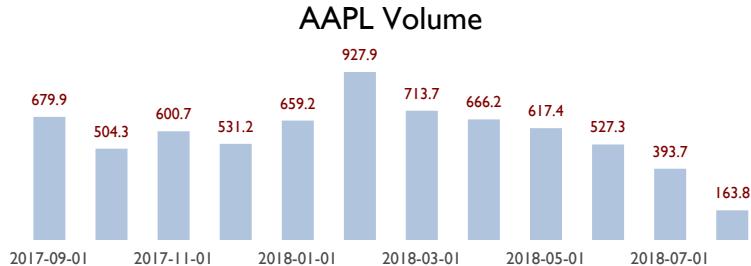
- text, image, list
- rect, ellipse, polygon
- line, arc, curve



decksh example.dsh | pdf

# Deck elements

- text, image, list
- rect, ellipse, polygon
- line, arc, curve

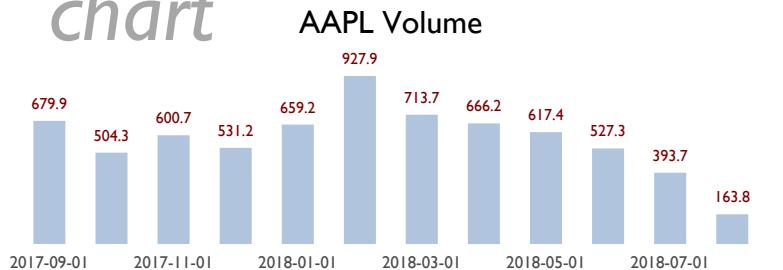


# *text* Deck elements

*list*

- text, image, list
- rect, ellipse, polygon
- line, arc, curve

*chart*



*rect*



*ellipse*



*polygon*



*image*



*line*



*arc*



*curve*



# Examples



Anthony J. Starks

Art + Code

---



+1 908.548.3403



ajstarks@gmail.com



@ajstarks



github.com/ajstarks



speakerdeck.com/ajstarks

```

deck
  mx=50      // midpoint
  tx=30      // text left
  ix=20      // image left
  ts=10      // base text size
  ss=ts*0.85 // sub-head text size
  cs=ts*0.55 // contact info text size
  ly=58      // line y

  slide "white" "rgb(100,100,100)"
    image "starx.png"           mx 87 512 512 7.5
    ctext "Anthony J. Starks"   mx 70 ts "sans" "black"
    ctext "Art + Code"         mx 62 ss "sans" "maroon"
    line ix ly 80 ly 0.3 "maroon"

    image "phone.png"          ix 50 1200 1200 1.2
    image "email.png"          ix 40 1200 1200 1.2
    image "twitter.png"        ix 30 1200 1200 1.2
    image "github.png"         ix 20 120 120 10
    image "sd.png"             ix 10 512 512 2.5

    text "+1 908.548.3403"     tx 49 cs
    text "ajstarks@gmail.com"   tx 39 cs
    text "@ajstarks"           tx 29 cs
    text "github.com/ajstarks"  tx 19 cs
    text "speakerdeck.com/ajstarks" tx 9 cs

  eslide
edeck

```



## Anthony J. Starks

### Art + Code

---



+1 908.548.3403



ajstarks@gmail.com



@ajstarks



github.com/ajstarks



speakerdeck.com/ajstarks

```
deck
  mx=50      // midpoint
  tx=30      // text left
  ix=20      // image left
  ts=10      // base text size
  ss=ts*0.85 // sub-head text size
  cs=ts*0.55 // contact info text size
  ly=58      // line y

  slide "white" "rgb(100,100,100)"
    image "starx.png"           mx 87 512 512 7.5
    ctext "Anthony J. Starks"   mx 70 ts "sans" "black"
    ctext "Art + Code"          mx 62 ss "sans" "maroon"
    line ix ly 80 ly 0.3 "maroon"

    image "phone.png"           ix 50 1200 1200 1.2
    image "email.png"           ix 40 1200 1200 1.2
    image "twitter.png"         ix 30 1200 1200 1.2
    image "github.png"          ix 20 120 120 10
    image "sd.png"              ix 10 512 512 2.5

    text "+1 908.548.3403"     tx 49 cs
    text "ajstarks@gmail.com"   tx 39 cs
    text "@ajstarks"            tx 29 cs
    text "github.com/ajstarks"  tx 19 cs
    text "speakerdeck.com/ajstarks" tx 9 cs
  eslide
edeck
```

Anthony J. Starks  
Art + Code

---

+1 908.548.3403

ajstarks@gmail.com

@ajstarks

github.com/ajstarks

speakerdeck.com/ajstarks

```

deck
  mx=50      // midpoint
  tx=30      // text left
  ix=20      // image left
  ts=10      // base text size
  ss=ts*0.85 // sub-head text size
  cs=ts*0.55 // contact info text size
  ly=58      // line y

  slide "white" "rgb(100,100,100)"
    image "starx.png"           mx 87 512 512 7.5
    ctext "Anthony J. Starks"   mx 70 ts "sans" "black"
    ctext "Art + Code"         mx 62 ss "sans" "maroon"
    line ix ly 80 ly 0.3 "maroon"

    image "phone.png"          ix 50 1200 1200 1.2
    image "email.png"          ix 40 1200 1200 1.2
    image "twitter.png"        ix 30 1200 1200 1.2
    image "github.png"         ix 20 120 120 10
    image "sd.png"             ix 10 512 512 2.5

    text "+1 908.548.3403"     tx 49 cs
    text "ajstarks@gmail.com"   tx 39 cs
    text "@ajstarks"           tx 29 cs
    text "github.com/ajstarks"  tx 19 cs
    text "speakerdeck.com/ajstarks" tx 9 cs

  eslide
edeck

```



## Anthony J. Starks

### Art + Code

---



+1 908.548.3403



ajstarks@gmail.com



@ajstarks



github.com/ajstarks



speakerdeck.com/ajstarks

```

deck
  mx=25          // midpoint
  tx=62          // text left
  ix=57          // image left
  ts=6           // base text size
  ss=ts*0.85    // sub-head text size
  cs=ts*0.50    // contact info text size
  lx=50          // line x

  slide "white" "rgb(100,100,100)"
    image "starx.png"           mx 75 512 512 7.5
    ctext "Anthony J. Starks"   mx 35 ts "sans" "black"
    ctext "Art + Code"         mx 22 ss "sans" "maroon"
    line  lx 90 lx 10 0.3 "maroon"

    image "phone.png"          ix 80 1200 1200 1.2
    image "email.png"          ix 65 1200 1200 1.2
    image "twitter.png"        ix 50 1200 1200 1.2
    image "github.png"         ix 35 120 120 10
    image "sd.png"             ix 20 512 512 2.5

    text "+1 908.548.3403"     tx 79 cs
    text "ajstarks@gmail.com"   tx 64 cs
    text "@ajstarks"           tx 49 cs
    text "github.com/ajstarks"  tx 34 cs
    text "speakerdeck.com/ajstarks" tx 19 cs

  eslide
edeck

```

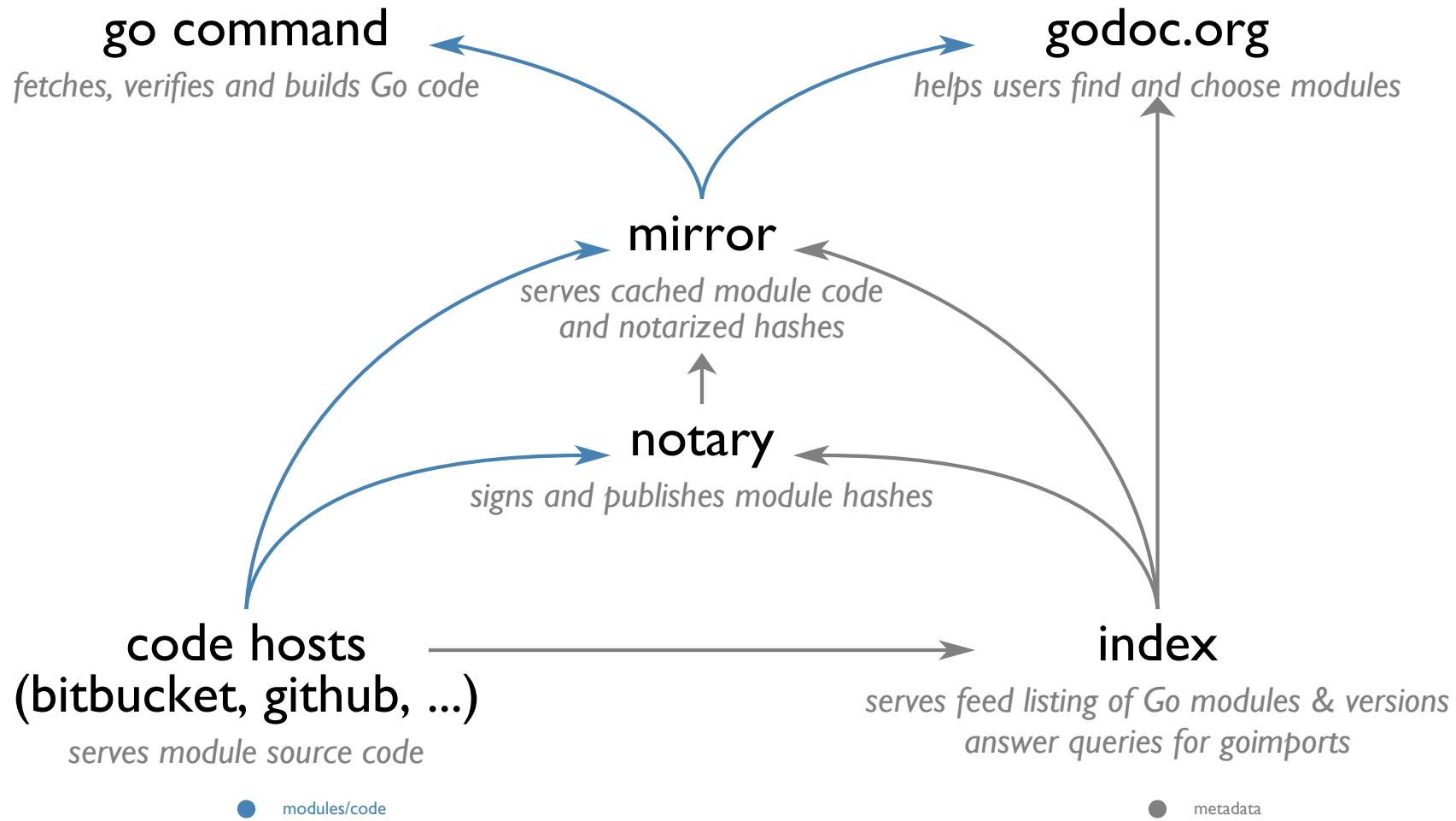


**Anthony J. Starks**  
**Art + Code**

---

-  +1 908.548.3403
-  ajstarks@gmail.com
-  @ajstarks
-  github.com/ajstarks
-  speakerdeck.com/ajstarks

# Go Module Information Flows



BOS



SFO

Virgin America 351

Gate B38

8:35am

On Time

JFK



IND

US Airways 1207

Gate C31C

5:35pm

**Delayed**

# Flight Information

Los Angeles (LAX)  New York/Newark (EWR)



Distance Traveled

1,958 mi

3,151 km

Distance to Destination

596 mi

798 km



Time to Destination

1:20

Estimated time of arrival

12:14 am

Local time of arrival

12:14 am

Ground speed



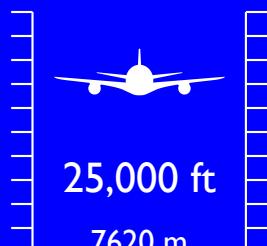
Headwind



Outside Temperature



Current Altitude





Pulp Fiction (1993)



The Matrix (1999)



Roma (2018)



Pulp Fiction (1993)



The Matrix (1999)



Roma (2018)

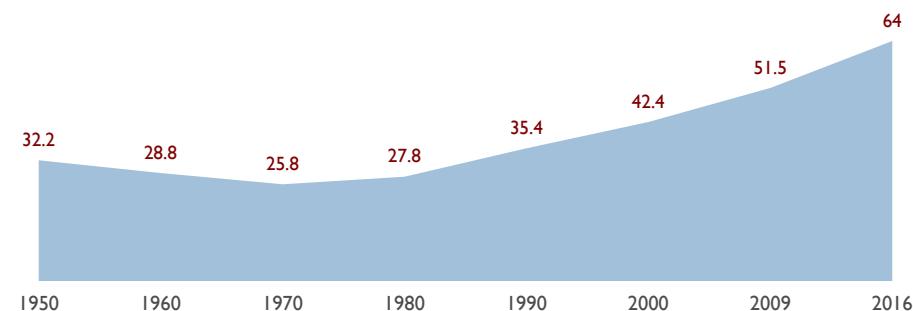
pulp04.png,1920,1080,Pulp Fiction (1993)  
matrix12.png,1920,1080,The Matrix (1999)  
roma04.png,1920,1080,Roma (2018)

caption movies.csv | decksh | pdf ...

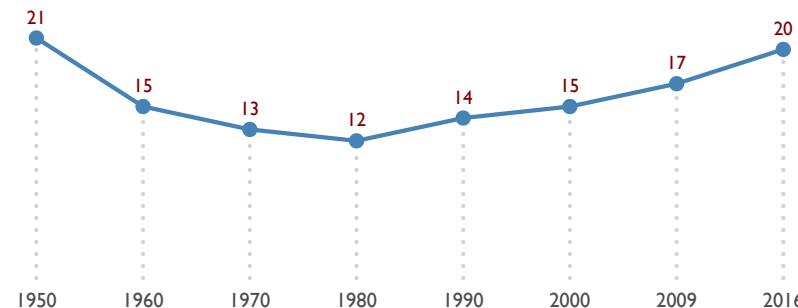
# A record 64 million Americans live in multigenerational households

The number and share of Americans living in multi- generational family households have continued to rise, despite improvements in the U.S. economy since the Great Recession. In 2016, a record 64 million people, or 20% of the U.S. population, lived with multiple generations under one roof, according to a new Pew Research Center analysis of census data.

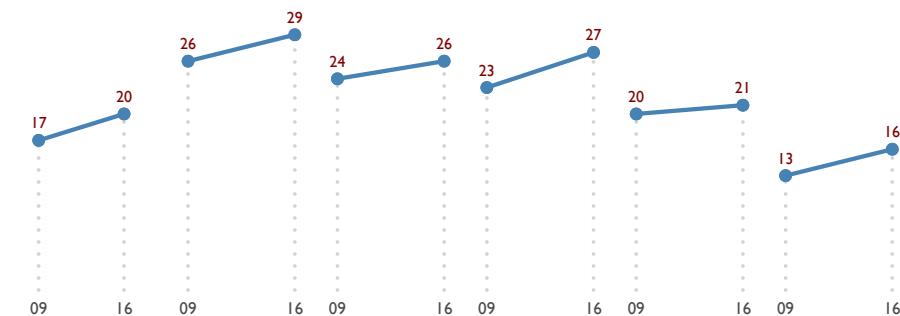
Multigenerational households (millions)



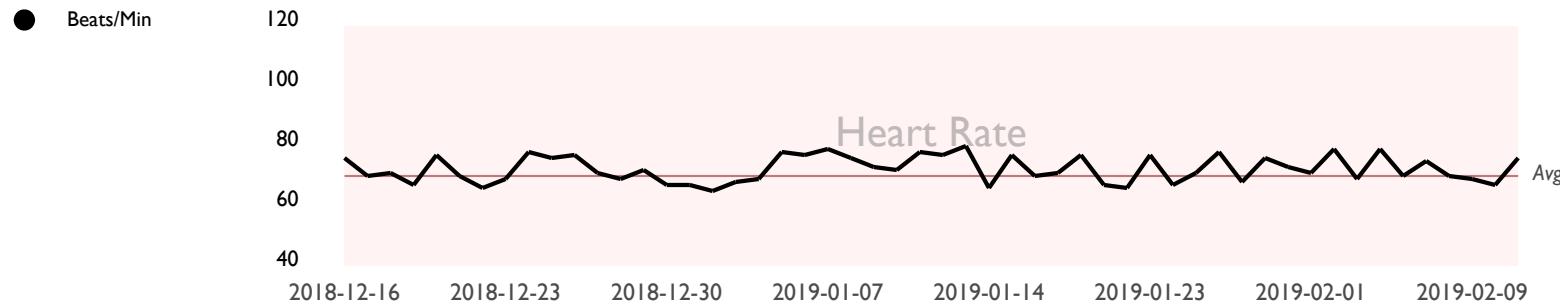
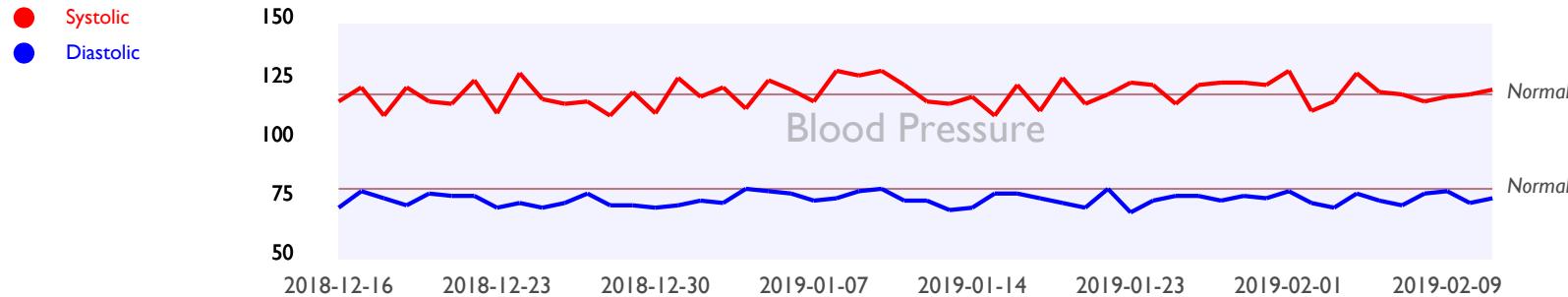
% of Americans in multigenerational households



Total      Asian      Black      Hispanic      Other      White

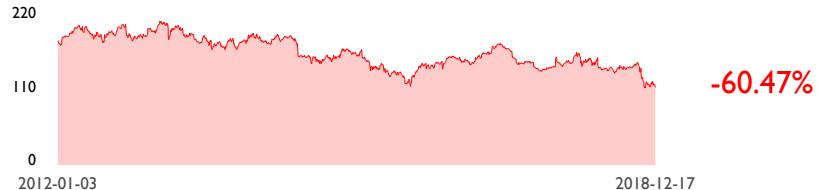


# Jane Doe





Rometty



The first woman to lead IBM, Rometty shifted IBM away from shrinking businesses such as computers and operating system software, and into higher-growth areas like artificial intelligence. Her tenure has also been met by fierce criticism relating to executive compensation bonuses, layoffs, outsourcing, and presiding over 24 consecutive quarters of revenue decline.



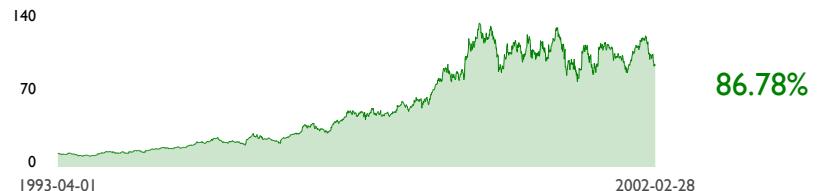
Palmisano



Palmisano's mandate was to move into new unique businesses with high profit margins and potential for innovation. This included purchasing PWC Consulting in 2002, so that IBM could go beyond selling computers and software and help customers use technology to solve business challenges in areas such as marketing, procurement and manufacturing.



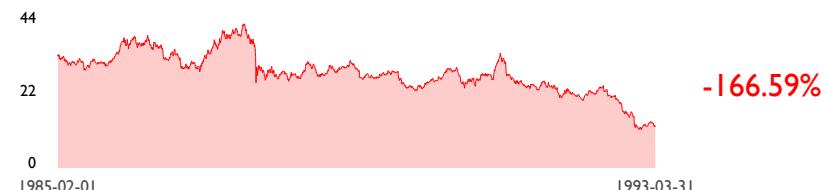
Gerstner



Gerstner's choice to keep the company together was the defining decision of his tenure, as these gave IBM the capabilities to deliver complete IT solutions to customers. Services could be sold as an add-on to companies that had already bought IBM computers, while barely profitable pieces of hardware were used to open the door to more profitable deals.

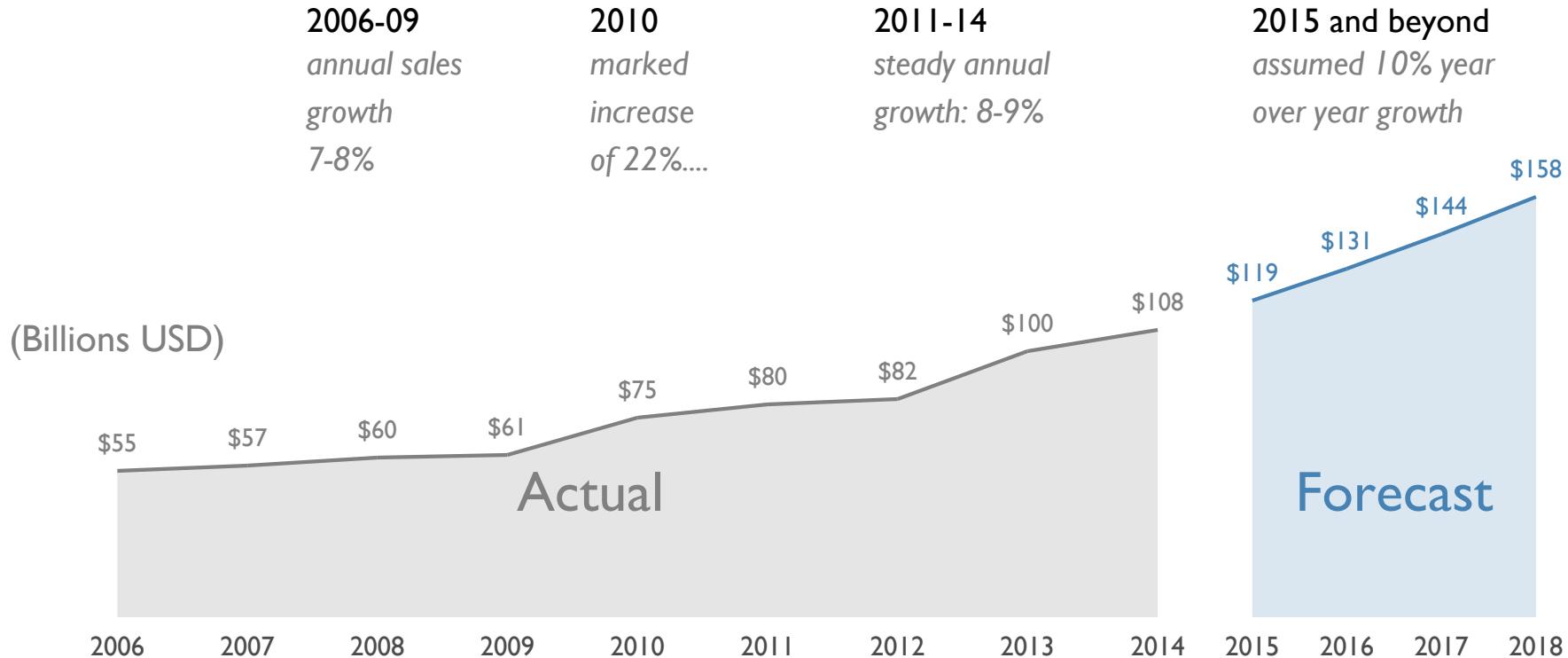


Akers

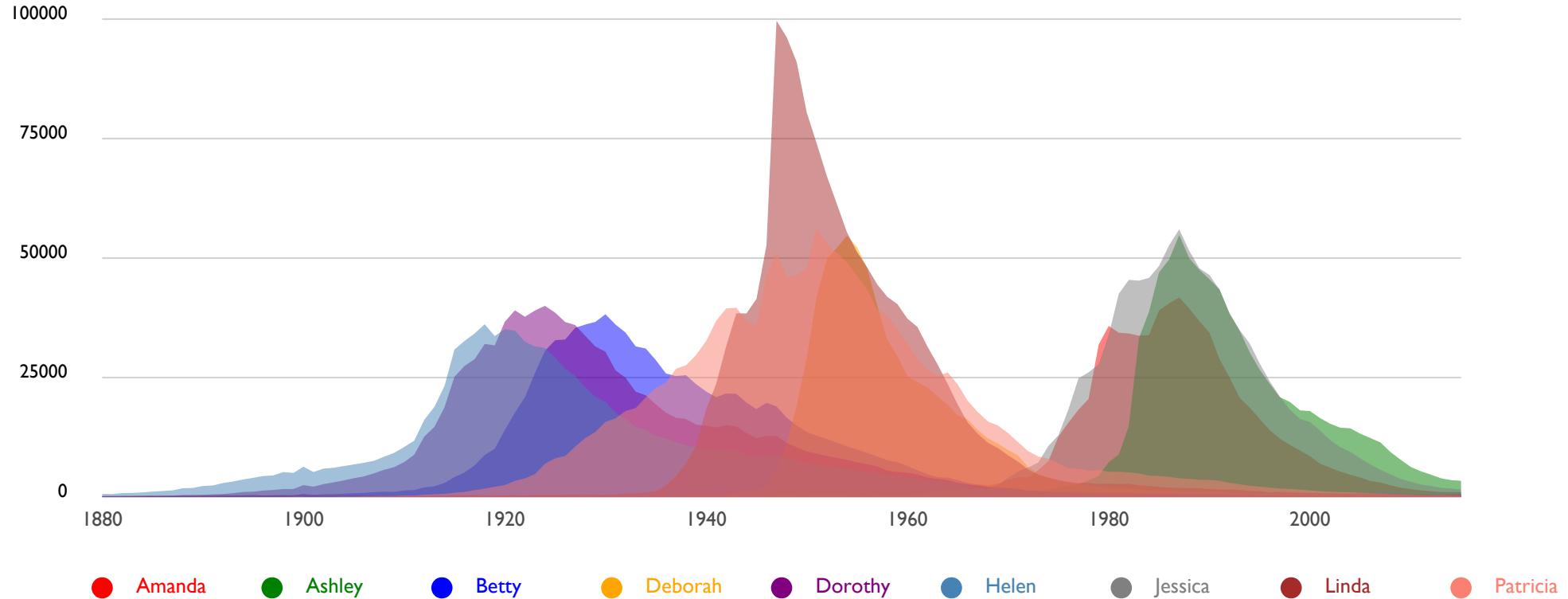


Akers was credited with simplifying the company's bureaucracy to focus more on profits. In a restructuring intended to reverse three years of disappointing performance, he created five new, autonomous organizations responsible for the company's innovation, design and manufacturing. Akers was forced to resign, after the company posted an unprecedented \$5 billion annual loss.

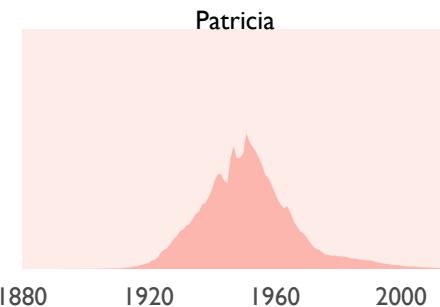
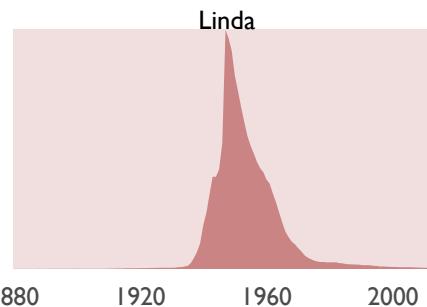
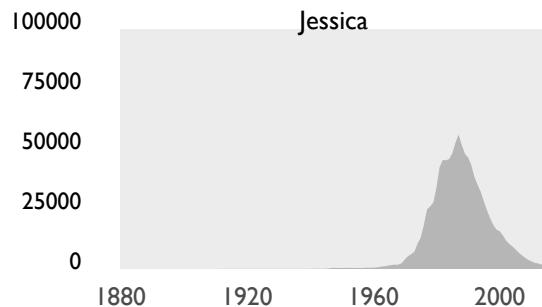
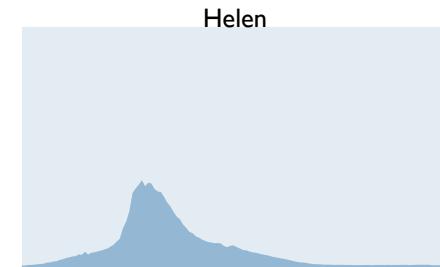
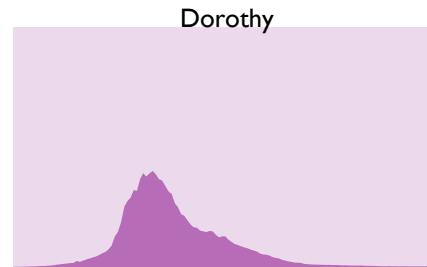
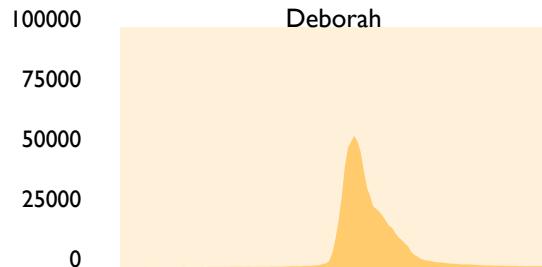
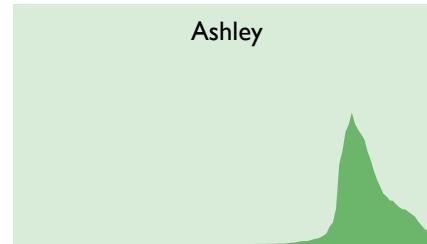
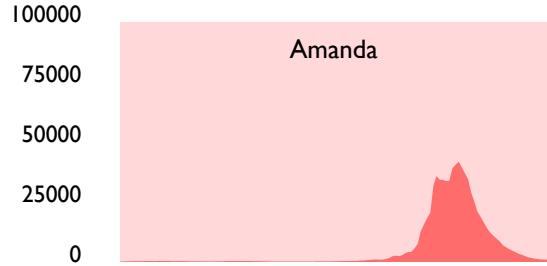
# Sales over time



# Evolution of Baby Names in the US: 1880-2015

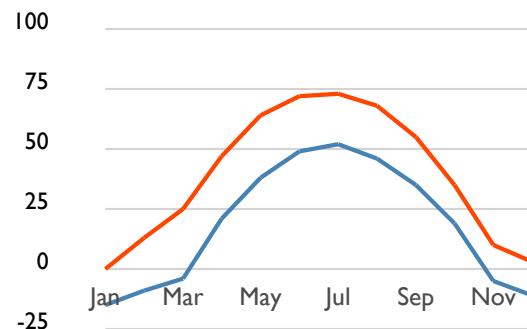


# Evolution of Baby Names in the US: 1880-2015

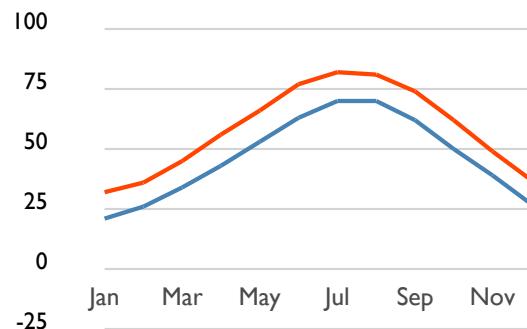


# Average High/Low Temperatures (°F)

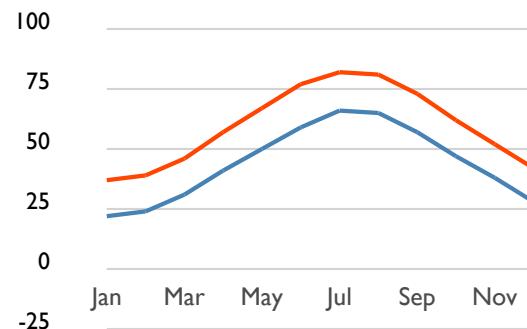
## Fairbanks



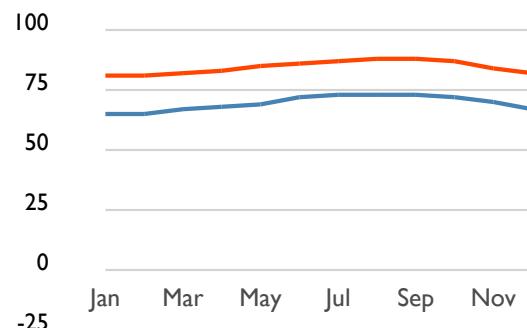
## Chicago



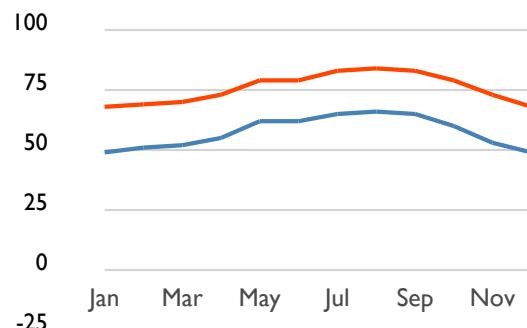
## Boston



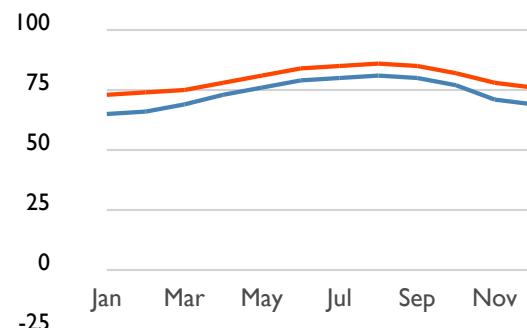
## Honolulu



## Los Angeles

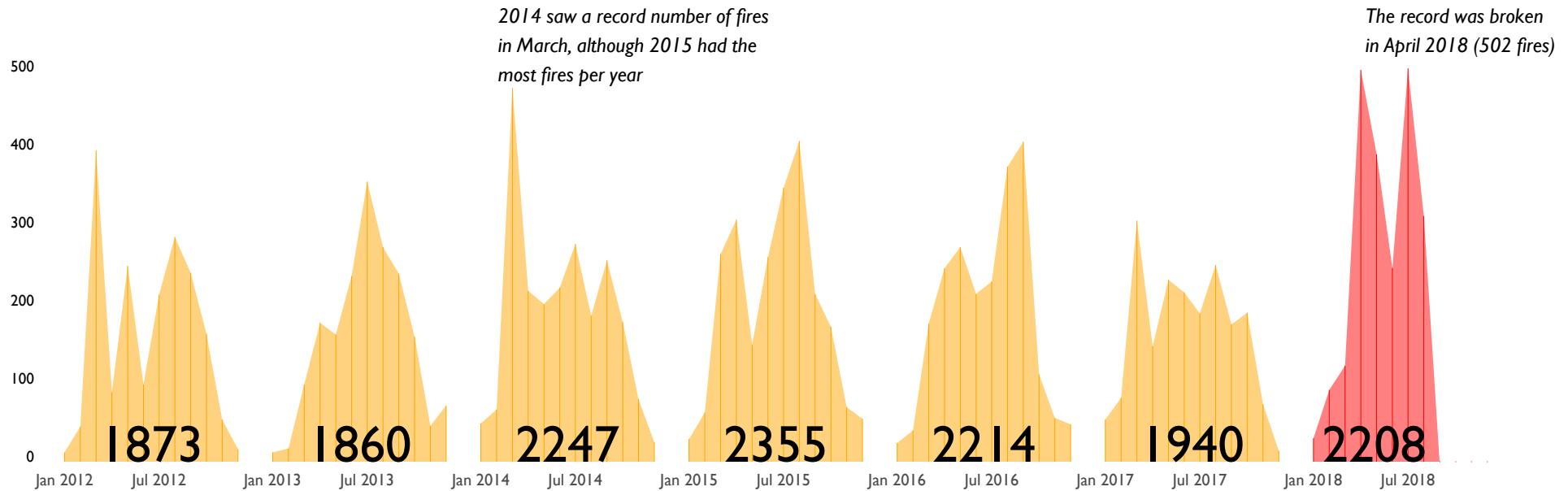


## Miami

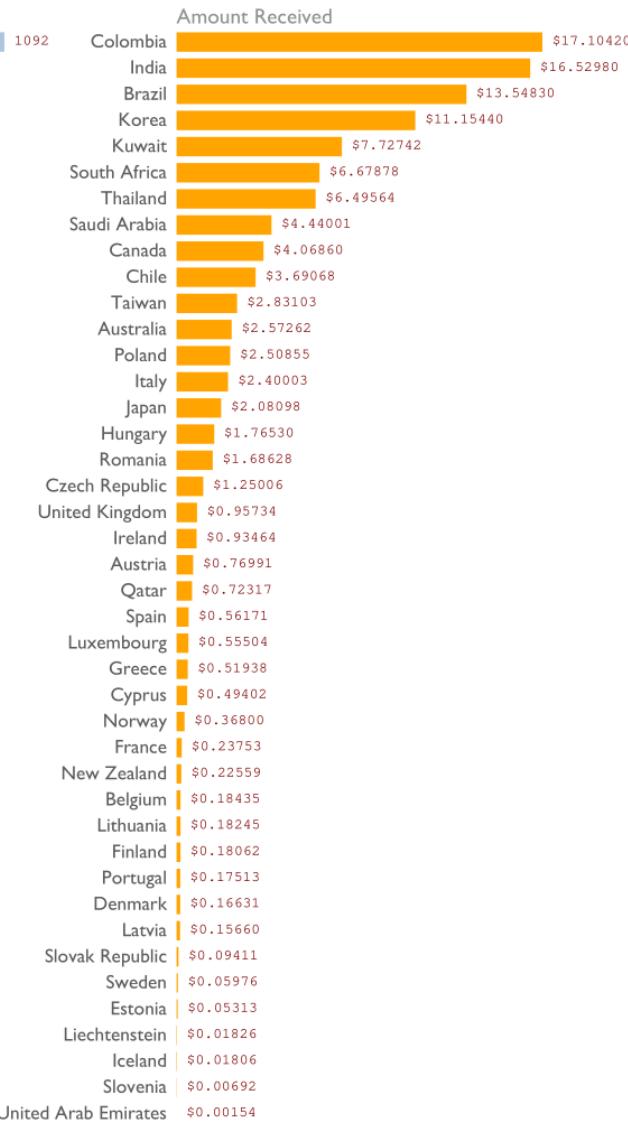
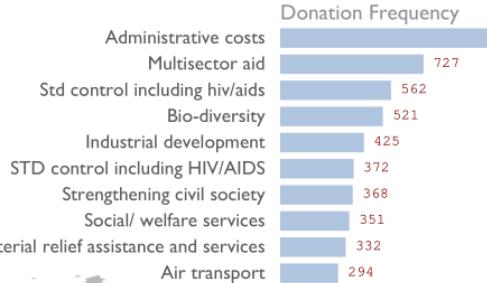
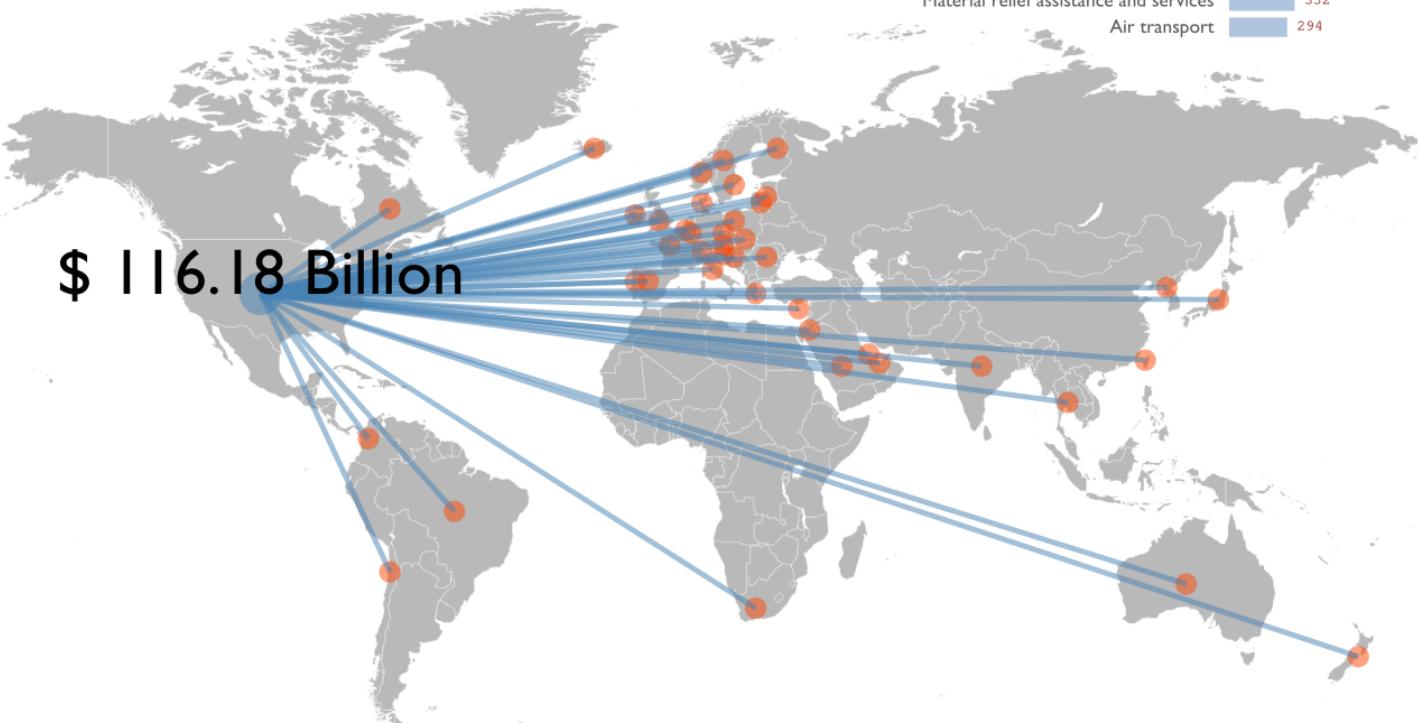


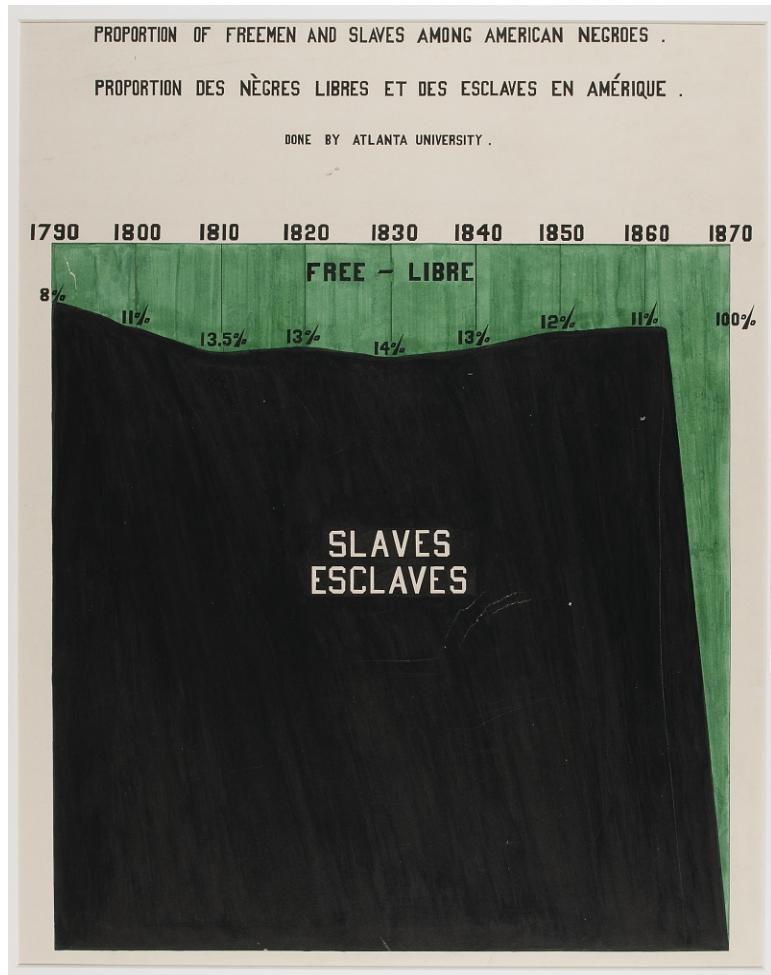
● Avg. High      ● Avg. Low

# German Wildfires 2012-2018



# United States

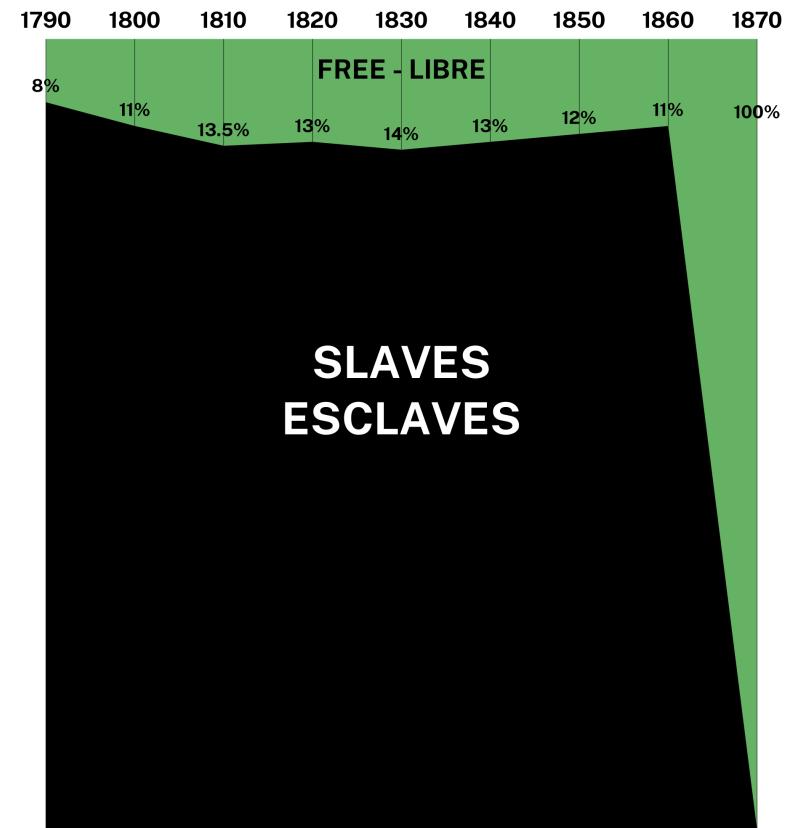




PROPORTION OF FREEMEN AND SLAVES AMONG AMERICAN NEGROES.

PROPORTION DES NÈGRES LIBRES ET DES ESCLAVES EN AMÉRIQUE.

DONE BY ATLANTA UNIVERSITY.



## CITY AND RURAL POPULATION AMONG AMERICAN NEGROES IN THE FORMER SLAVE STATES

## **POPULATION DES NÈGRES HABITANT LES VILLES ET DE CEUX HABITANT LES COMPAGNES DANS LES ANCIENS**

ETATS ESCLAVES

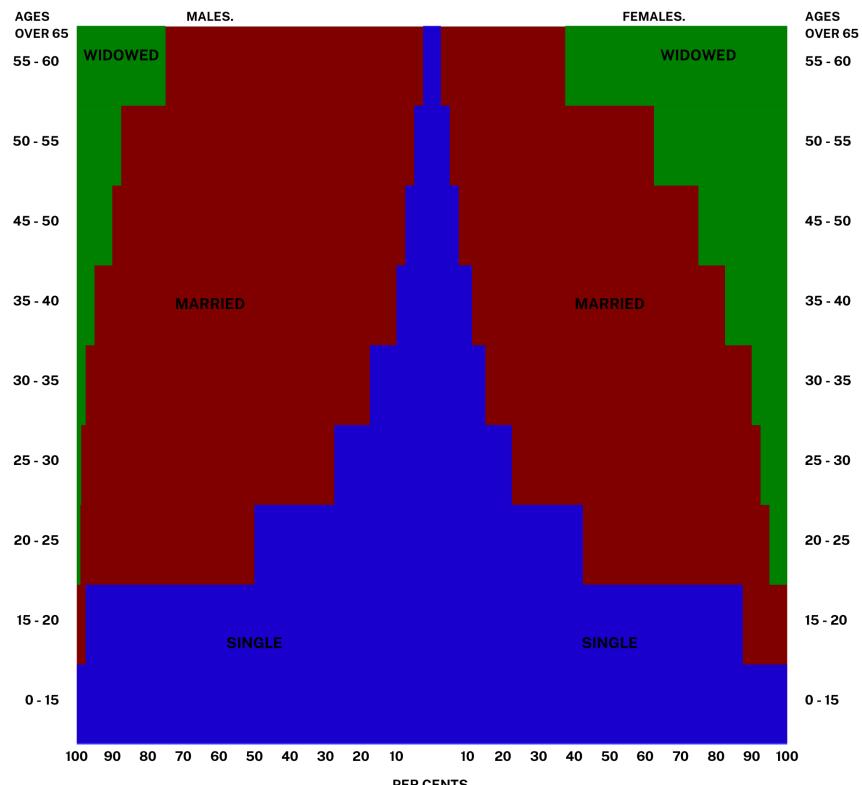
PROPORTION  LIVING IN CITIES OF 8,000 INHABITANTS OR MORE  
PROPORTION DANS LES VILLES DE 8,000 HABITANTS DU PLUS

PROPORTION ■■■■■ LIVING IN VILLAGES OR COUNTRY DISTRICTS  
PROPORTION DANS LES VILLAGES ET LES COMPAGNES



### Conjugal condition of American Negroes according to age periods.

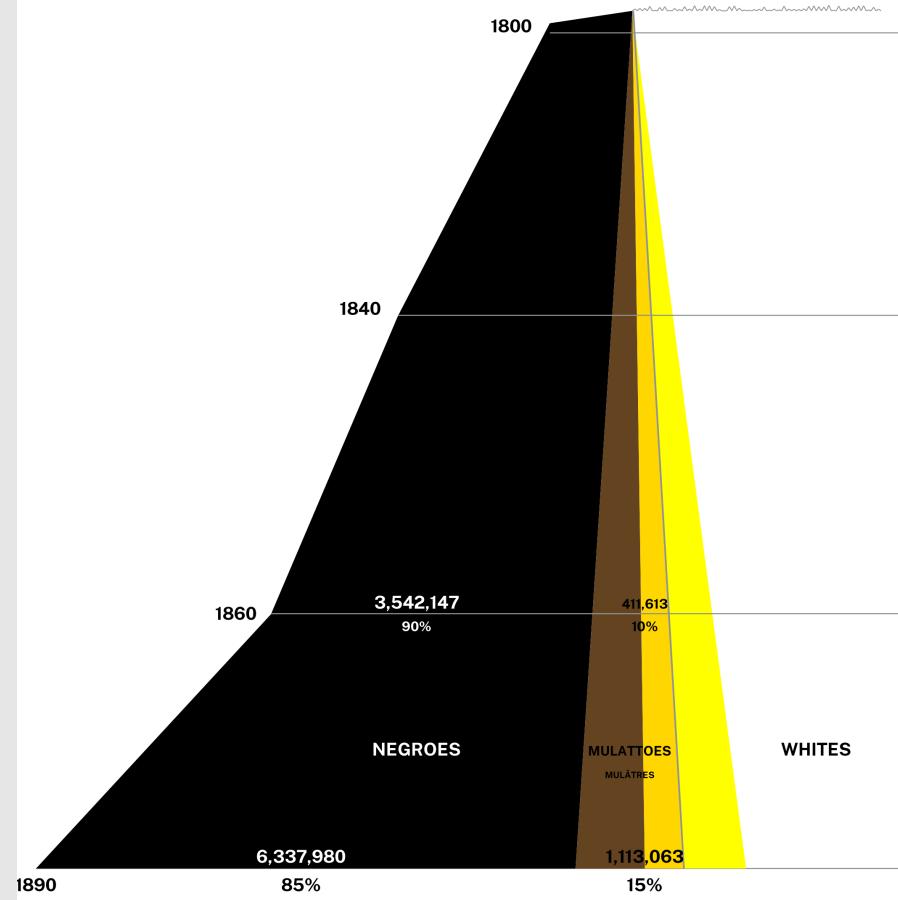
## Condition conjugale des Nègres Americains au point de vue le l'age



Amalgamation of the White and Black elements of the population  
in the United States

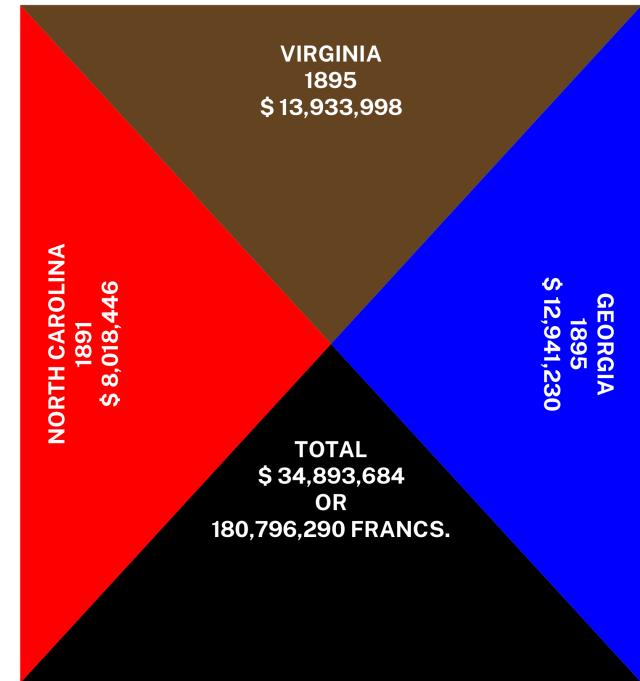
Amalgamation des éléments blancs et noirs parmi la population Americaine

Done by Atlanta University

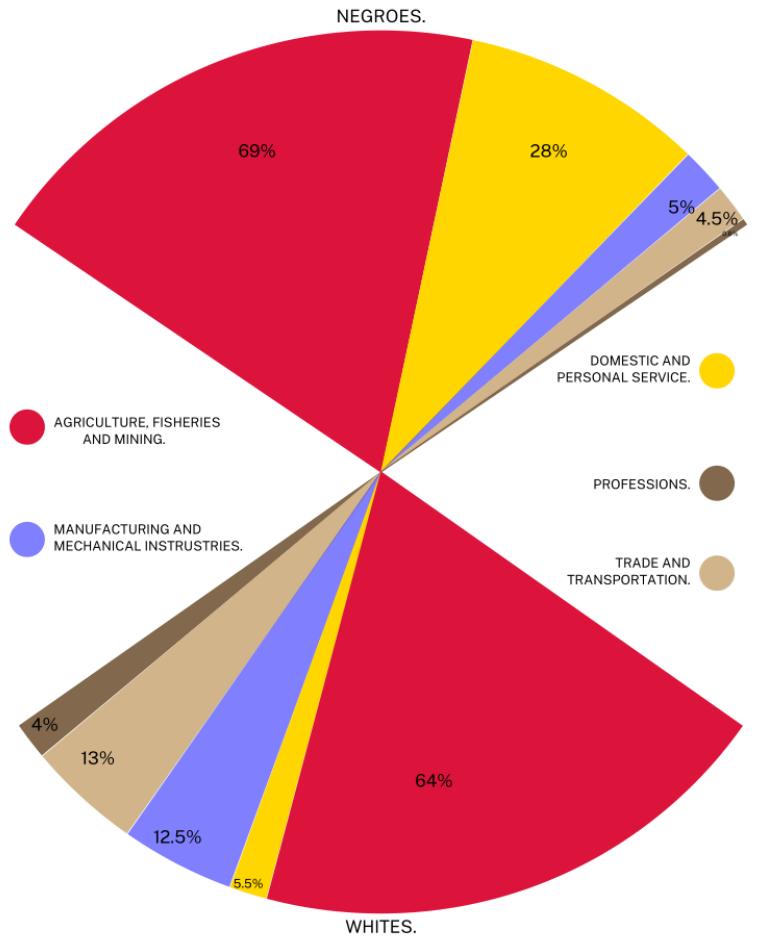


Proprietes contribuables des Nègres dans trois Etats des Etats Unis

Done by Atlanta University



## OCCUPATIONS OF NEGROES AND WHITES IN GEORGIA.



## Negro business men in the United States

Nègres Americains dans les affaires

Estimated capital

\$ 8,784,637  
45,516,254 FRANCS

General merchandise stores

Grocers

Bankers

Undertakers

Building contractors

Druggists

Publishers

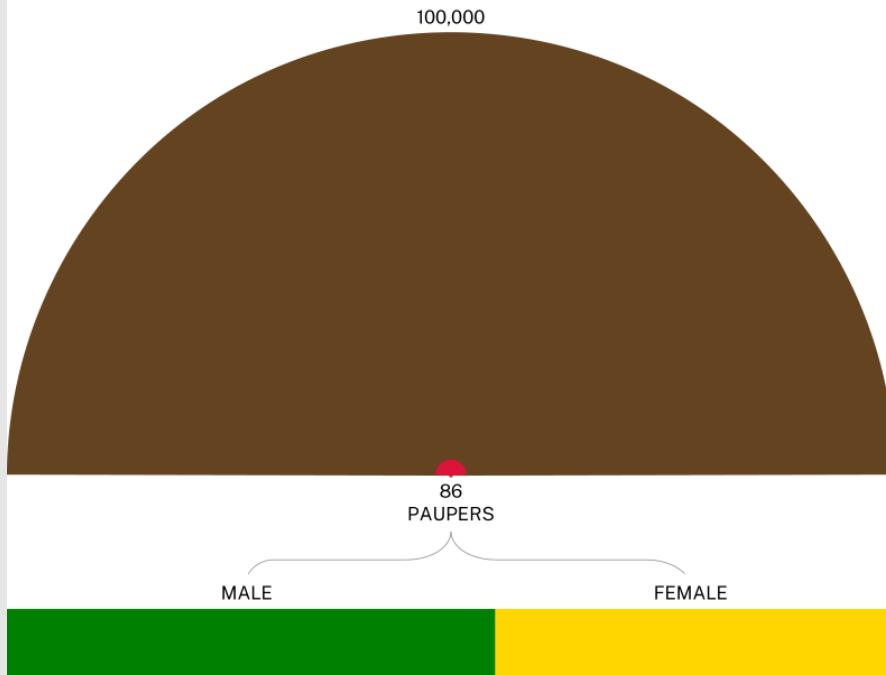
Building and loan associations

## Pauperism among American Negroes.

Pauperisme parmi les Nègres Americains

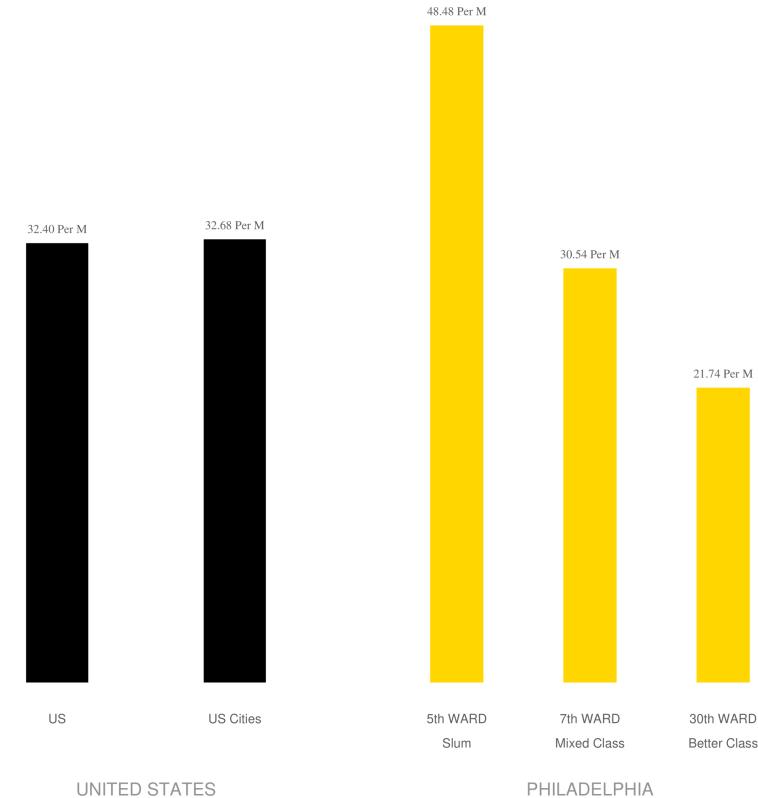
Done by Atlanta University

PROPORTION OF ALMSHOUSE PAUPERS IN EVERY 100,000 NEGROES.



## Mortality of American Negroes.

Mortalité parmi les Nègres Américains.



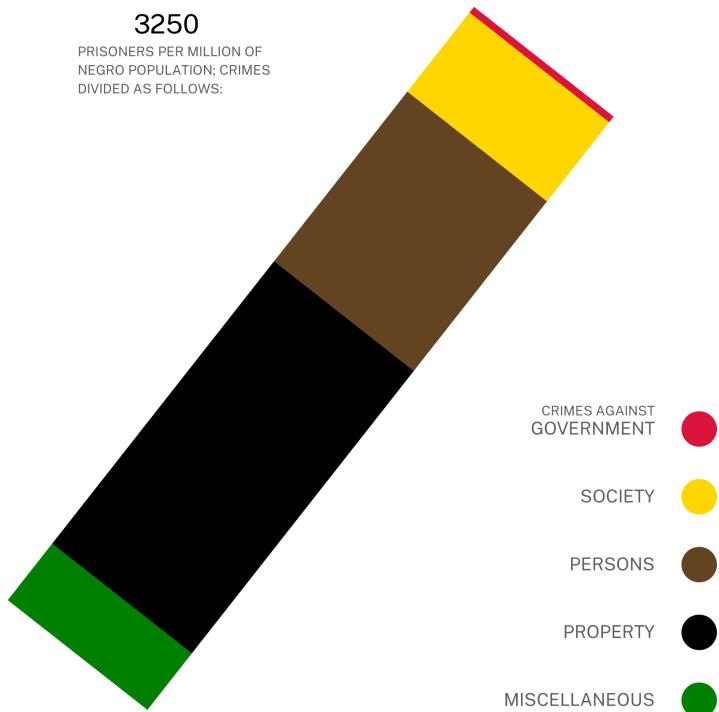
Crime among American Negroes.

Criminalité parmi les Nègres Americains

Done by Atlanta University

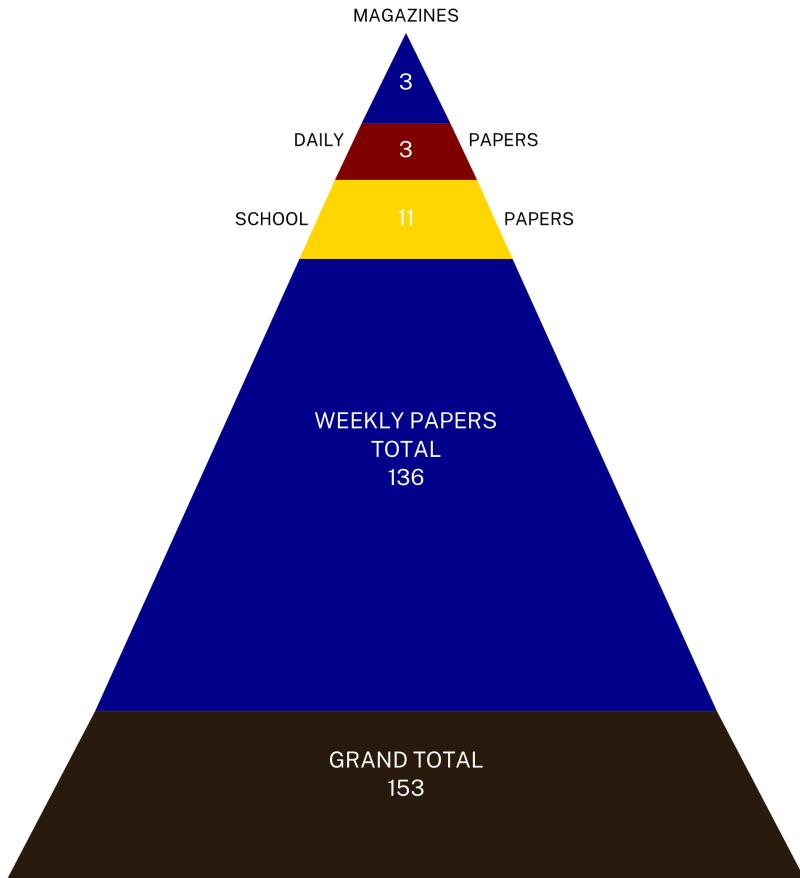
3250

PRISONERS PER MILLION OF  
NEGRO POPULATION; CRIMES  
DIVIDED AS FOLLOWS:

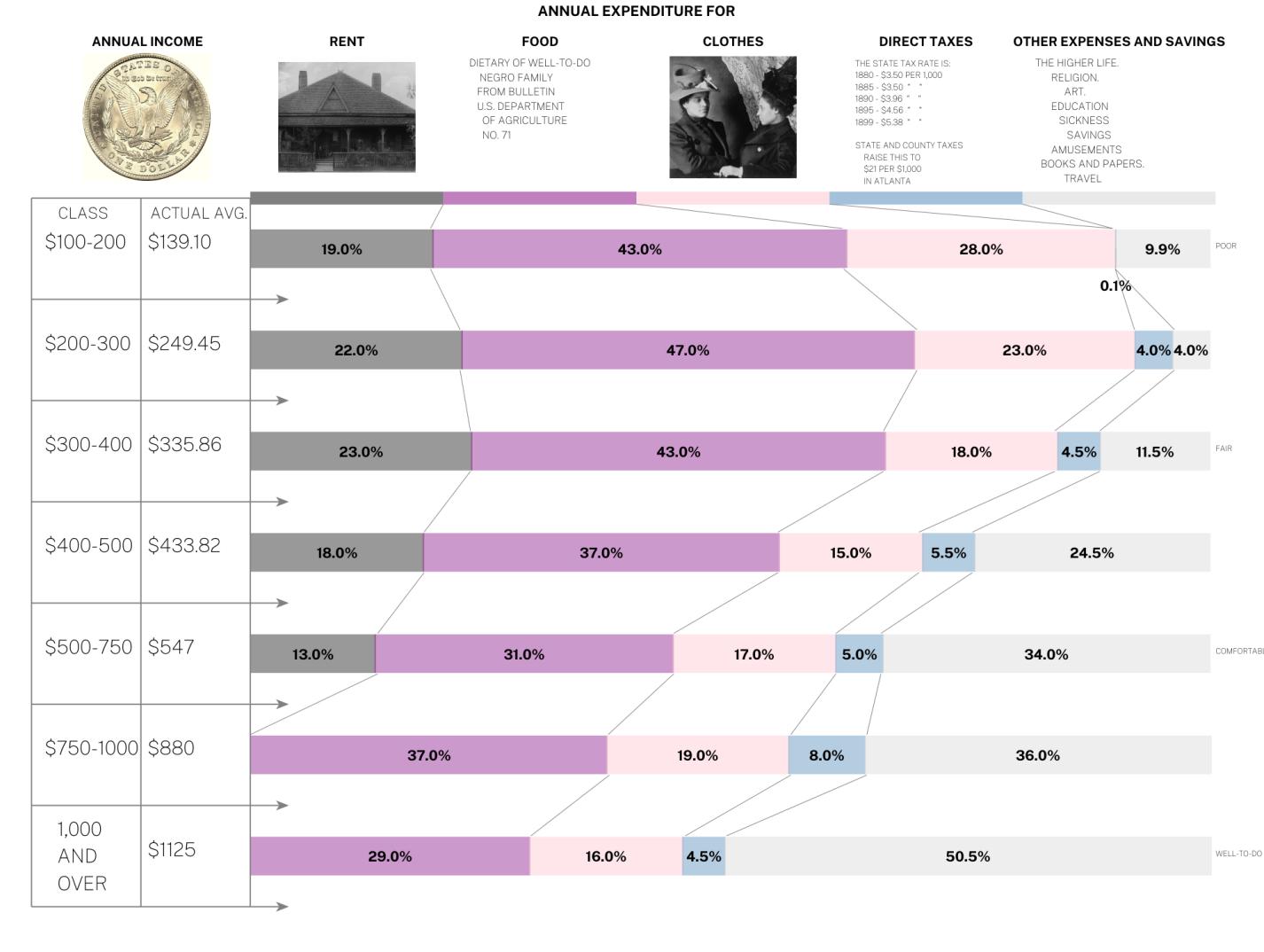


American Negro newspapers and periodicals

Journaux et publications périodiques Nègres aux Etats Unis.



# INCOME AND EXPENDITURE OF 150 NEGRO FAMILIES IN ATLANTA, GA., U.S.A.



## INCOME AND EXPENDITURE OF 150 NEGRO FAMILIES IN ATLANTA, GA., U.S.A.

ANNUAL EXPENDITURE FOR



FOOD  
DIETARY OF WELL-TO-DO  
NEGRO FAMILY  
FROM BULLETIN  
U.S. DEPARTMENT  
OF AGRICULTURE  
NO. 71

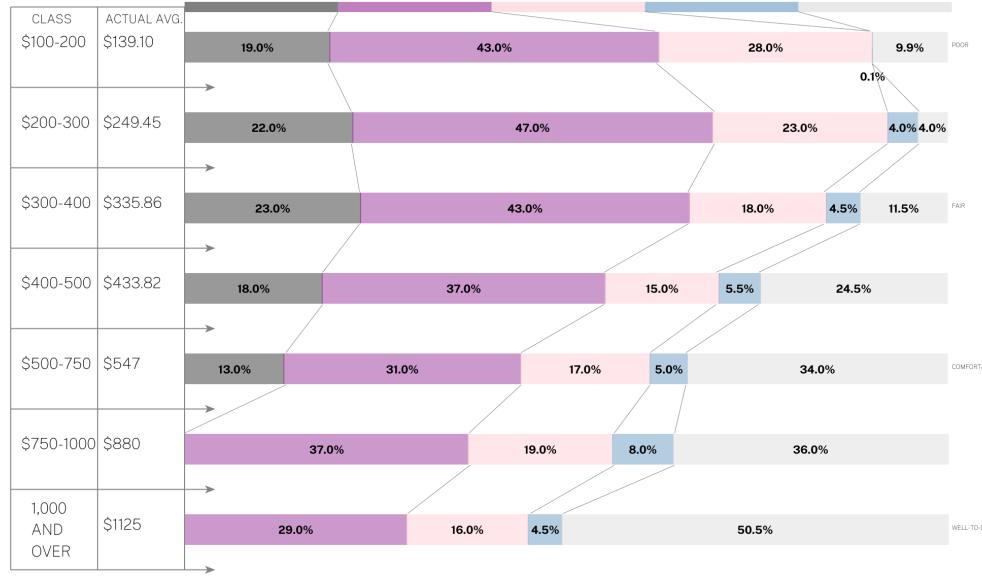


CLOTHES

DIRECT TAXES  
THE STATE TAX RATE IS:  
1880 - \$3.50 PER 1000  
1885 - \$3.60 \*  
1890 - \$3.70 \*  
1895 - \$4.50 \*  
1899 - \$5.38 \*

STATE AND COUNTY TAXES  
RAISE THIS TO  
\$21 PER \$1000  
IN ATLANTA

OTHER EXPENSES AND SAVINGS  
THE HIGHER LIFE.  
RELIGION.  
ART.  
EDUCATION  
SOCIAL  
SAVINGS  
AMUSEMENTS  
BOOKS AND PAPERS.  
TRAVEL



Title

Categories

Income

Charts

# *go get it*

deck

`github.com/ajstarks/deck`

decksh

`github.com/ajstarks/deck/cmd/decksh`

pdfdeck

`github.com/ajstarks/deck/cmd/pdfdeck`

dchart

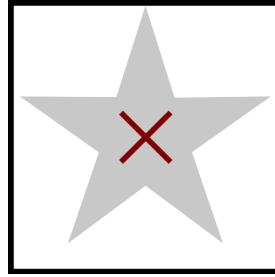
`github.com/ajstarks/deck/cmd/dchart`

examples

`github.com/ajstarks/deckviz`

fonts

`github.com/ajstarks/deckfonts`



# Anthony J. Starks

## Art + Code



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@ajstarks



[github.com/ajstarks](https://github.com/ajstarks)



[speakerdeck.com/ajstarks](https://speakerdeck.com/ajstarks)