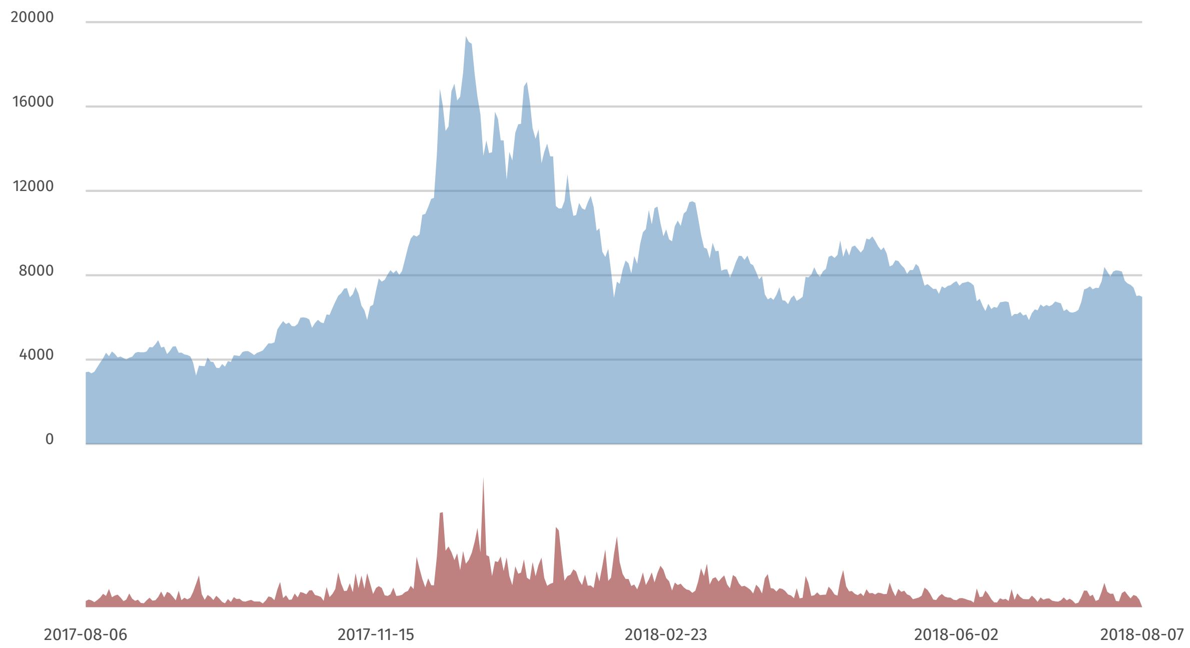
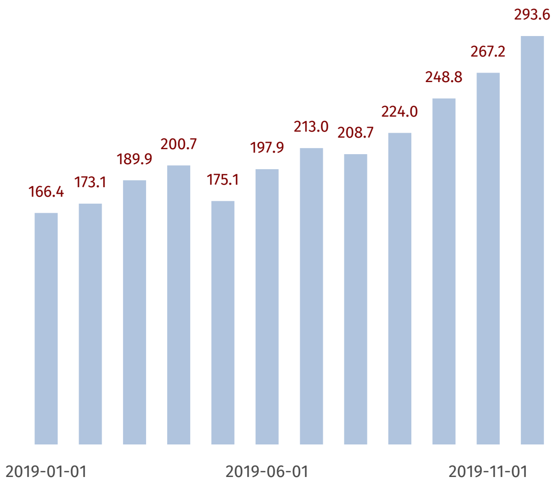
# dchart: charts for deck/decksh

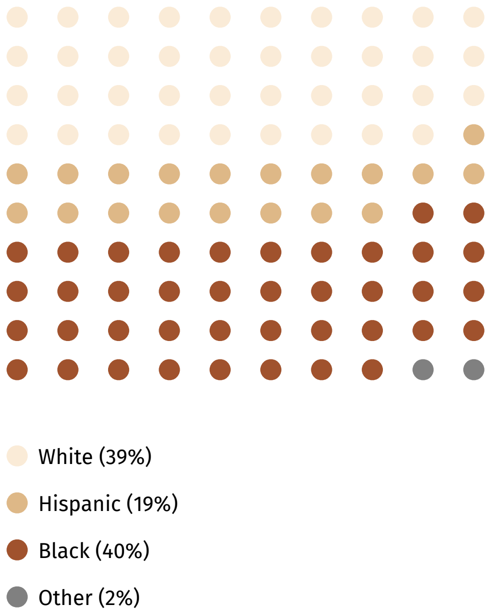
## Bitcoin to USD



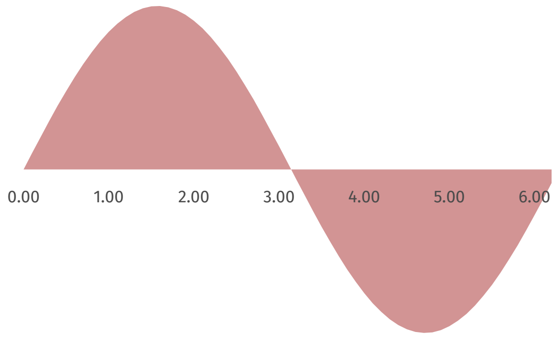
## AAPL Closing Price



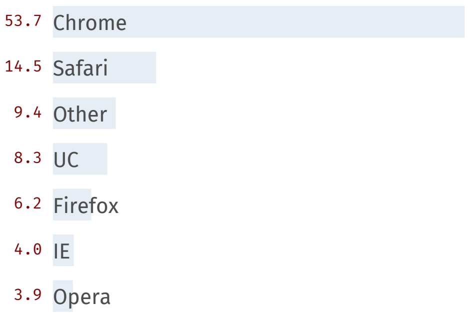
## US Incarceration Rate



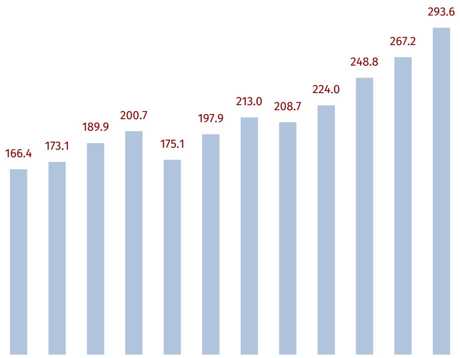
## y=sin(x)



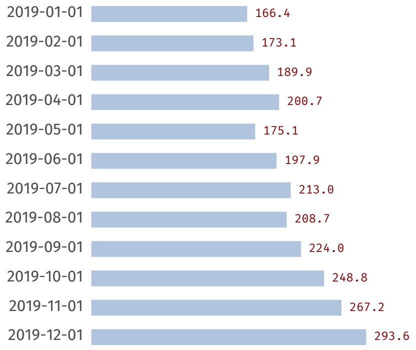
## Browser Market Share Dec 2016-Dec 2017



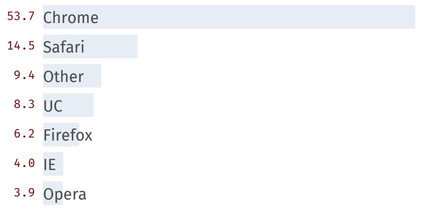
# Chart Types



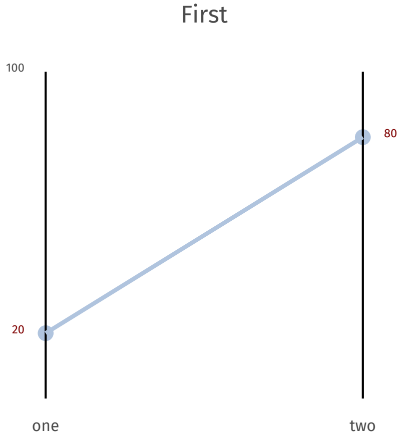
Column



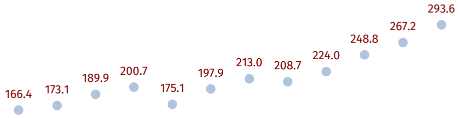
Bar



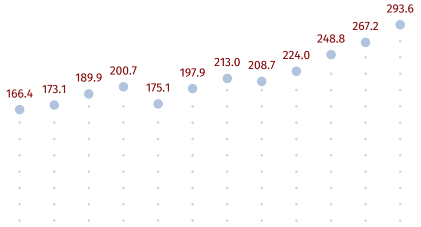
Word Bar



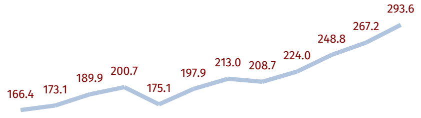
Slope



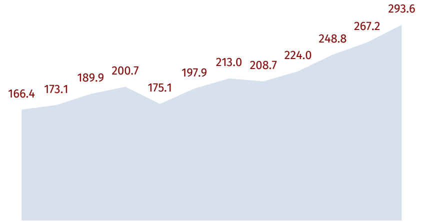
Scatter



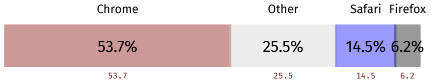
Dot



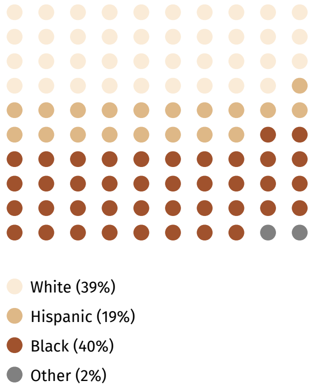
Line



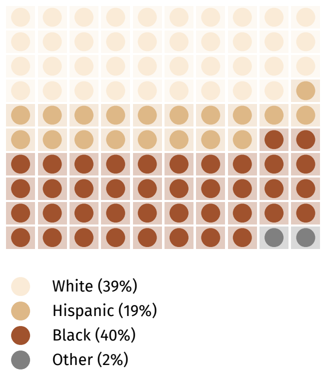
Area



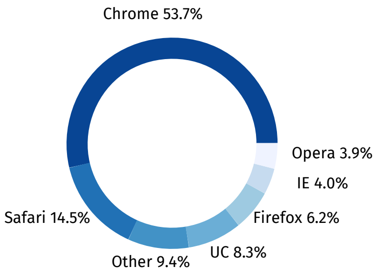
Proportional Map



Proportonal Grid

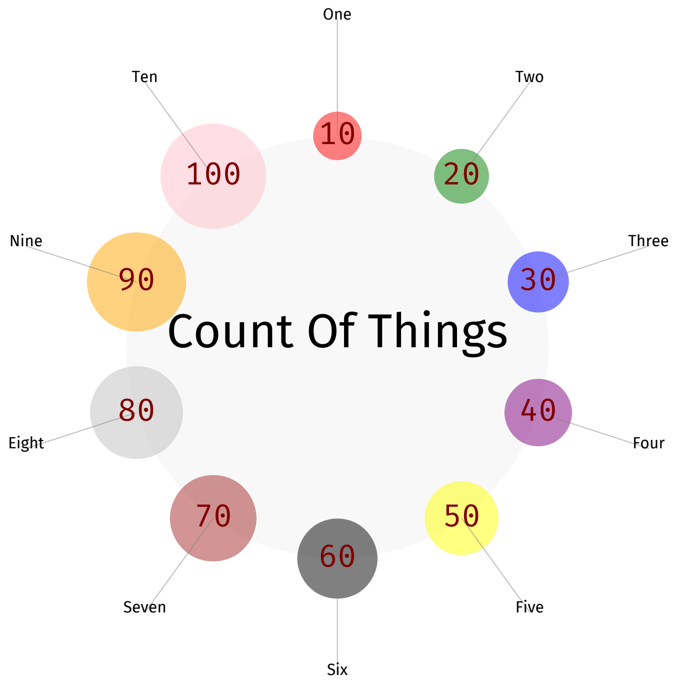


Lego

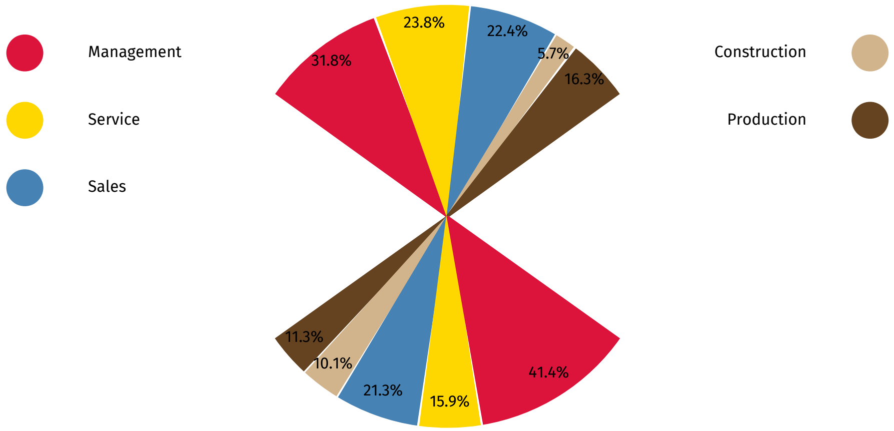


Donut/Pie

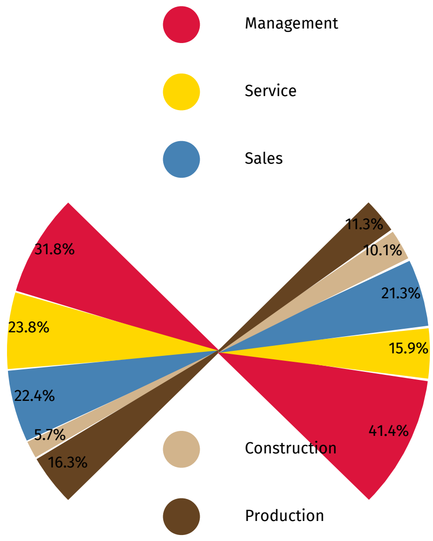
# Chart Types (continued)



Radial



Fan



Bowtie

# Data

## Tab-Separated

X Label Y Value

```
# AAPL Closing Price
2019-01-01	166.440002
2019-02-01	173.149994
2019-03-01	189.949997
2019-04-01	200.669998
2019-05-01	175.070007
2019-06-01	197.919998
2019-07-01	213.039993
2019-08-01	208.740005
2019-09-01	223.970001
2019-10-01	248.759995
2019-11-01	267.250000
2019-12-01	293.649994
```

## Comma-Separated (CSV)

Columns (pick two)

```
Date,Open,High,Low,Close,Adj Close,Volume
2019-01-01,154.889999,169.000000,142.000000,166.440002,163.587997,828087400
2019-02-01,166.960007,175.869995,165.929993,173.149994,170.183029,472540600
2019-03-01,174.279999,197.690002,169.500000,189.949997,187.495865,650981400
2019-04-01,191.639999,208.479996,188.380005,200.669998,198.077362,506117700
2019-05-01,209.880005,215.309998,174.990005,175.070007,172.808105,739456600
2019-06-01,175.600006,201.570007,170.270004,197.919998,196.115219,515187300
2019-07-01,203.169998,221.369995,198.410004,213.039993,211.097366,473957000
2019-08-01,213.899994,218.029999,192.580002,208.740005,206.836563,681074600
2019-09-01,206.429993,226.419998,204.220001,223.970001,222.770889,542567100
2019-10-01,225.070007,249.750000,215.130005,248.759995,247.428162,608302700
2019-11-01,249.539993,268.000000,249.160004,267.250000,265.819183,448331500
2019-12-01,267.269989,293.970001,256.290009,293.649994,292.954712,597198700
```

# Data to Chart

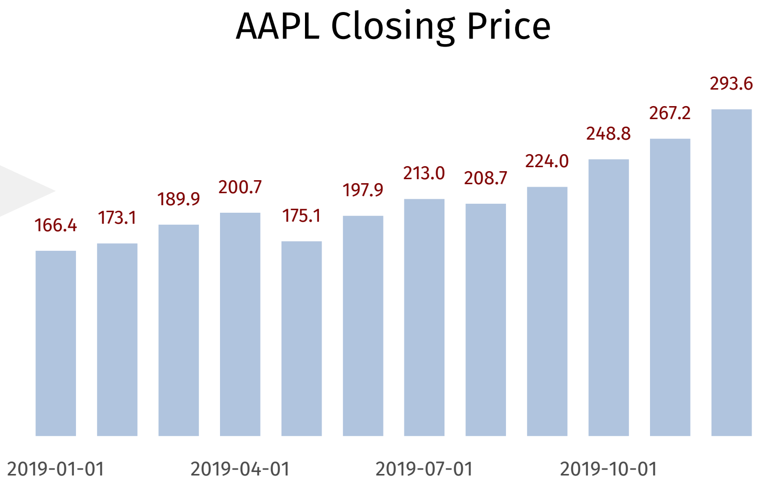
## Data

```
# AAPL Closing Price
2019-01-01	166.440002
2019-02-01	173.149994
2019-03-01	189.949997
2019-04-01	200.669998
2019-05-01	175.070007
2019-06-01	197.919998
2019-07-01	213.039993
2019-08-01	208.740005
2019-09-01	223.970001
2019-10-01	248.759995
2019-11-01	267.250000
2019-12-01	293.649994
```

## Markup

```
<deck>
  <canvas width="0" height="0" />
  <slide bg="white">
    <text ...>AAPL Volume</text>
    <line ... color="lightsteelblue" />
    <text ... color="rgb(127,0,0)">563.1</text>
    <text ... color="rgb(75,75,75)">2017-01-01</text>
    .
    .
    .
  </slide>
</deck>
```

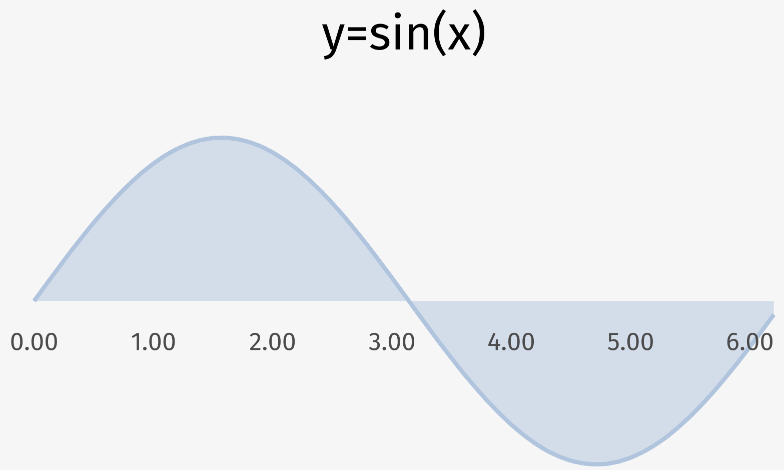
## PDF Rendition


AAPL Closing Price

```
dchart AAPL.d | pdf
```

# Generating data for charts

```
package main

import (
	"fmt"
	"math"
)

func main() {
	fmt.Println("# y=sin(x)")
	for x := 0.0; x < math.Pi*2; x += 0.1 {
		fmt.Printf("%.2f\t%.4f\n", x, math.Sin(x))
	}
}
```



```
# y=sin(x)
0.00     0.0000
0.10     0.0998
0.20     0.1987
0.30     0.2955
0.40     0.3894
0.50     0.4794
0.60     0.5646
0.70     0.6442
0.80     0.7174
.
.
5.80     -0.4646
5.90     -0.3739
6.00     -0.2794
6.10     -0.1822
6.20     -0.0831
```

```
go run sine.go |
dchart -bar=f -val=f -xlabel=10 -line -vol -bottom=50 |
pdfdeck -stdout - > sine.pdf
```

# dchart API

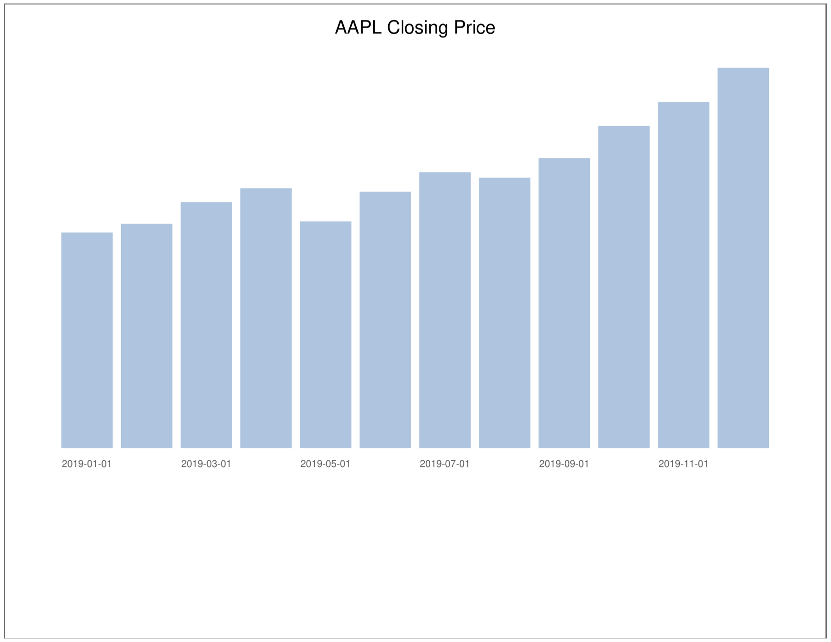
```
NewChart(chartype string, top, bottom, left, right float64) => settings
settings.[thing] = ...
settings.GenerateChart(deck *generate.Deck, io.ReadCloser)
```

| | |
|---|---|
| Chart Data | `[]ChartData` |
| Chart Settings | `Settings` |
| | |
| Read CSV or TSV | `Getdata(r io.ReadCloser, readcsv bool, cols string) ([]ChartData,float64,float64,string)` |
| Read TSV | `TSVdata(r io.ReadCloser) ([]ChartData, float64, float64, string)` |
| Read CSV | `CSVdata(r io.ReadCloser, csvcols string) ([]ChartData, float64, float64, string)` |
| | |
| Defne a Chart | `NewChart(chartType string, top, bottom, left, right float64) Settings` |
| Define Standalone | `NewFullChart(chartType string, top, bottom, left, right float64) Settings` |
| Make Chart | `(s *Settings) GenerateChart(deck *generate.Deck, r io.ReadCloser)` |
| Write the Chart | `(s *Settings) Write(w io.Writer, r io.ReadCloser)` |

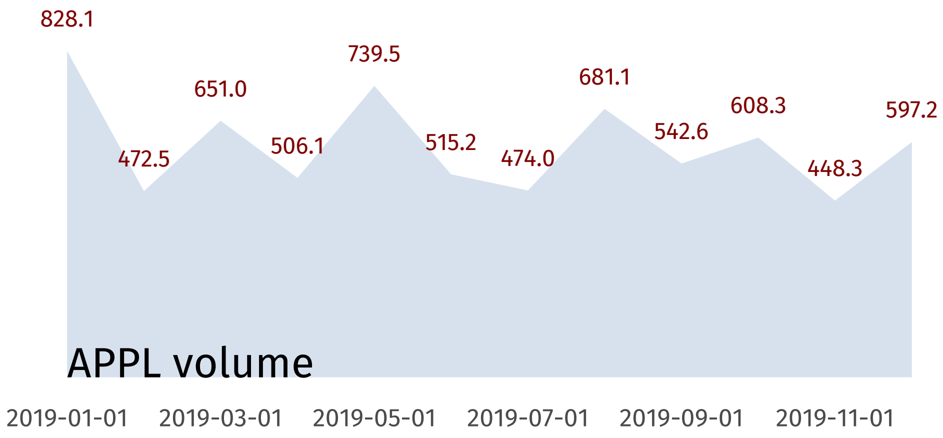
# Example Program

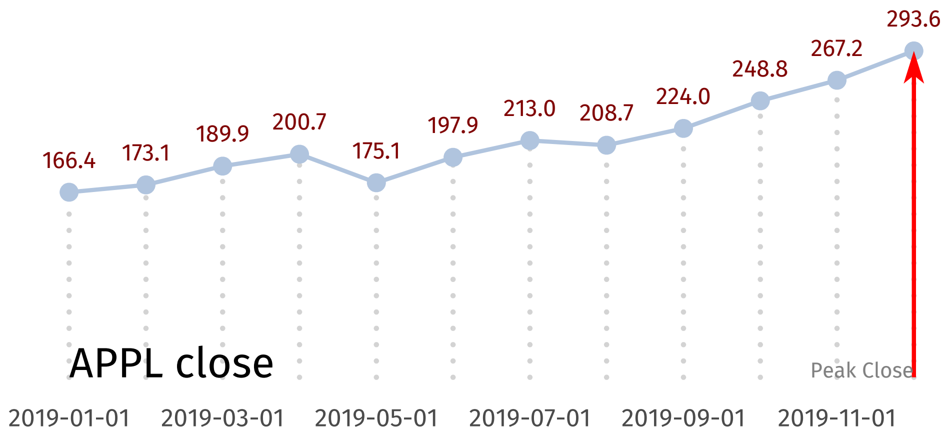
```
package main

import (
    "fmt"
    "os"

    "github.com/ajstarks/dchart"
    "github.com/ajstarks/deck/generate"
)

func main() {
    chart := dchart.NewFullChart("bar", 0, 0, 0, 0)
    chart.ShowTitle = true
    chart.XLabelInterval = 2
    deck := generate.NewSlides(os.Stdout, 0, 0)
    deck.StartDeck()
    for _, f := range os.Args[1:] {
        r, err := os.Open(f)
        if err != nil {
            fmt.Fprintf(os.Stderr, "%v\n", err)
            continue
        }
        chart.GenerateChart(deck, r)
    }
    deck.EndDeck()
}
```

```
go run main.go | pdf
```



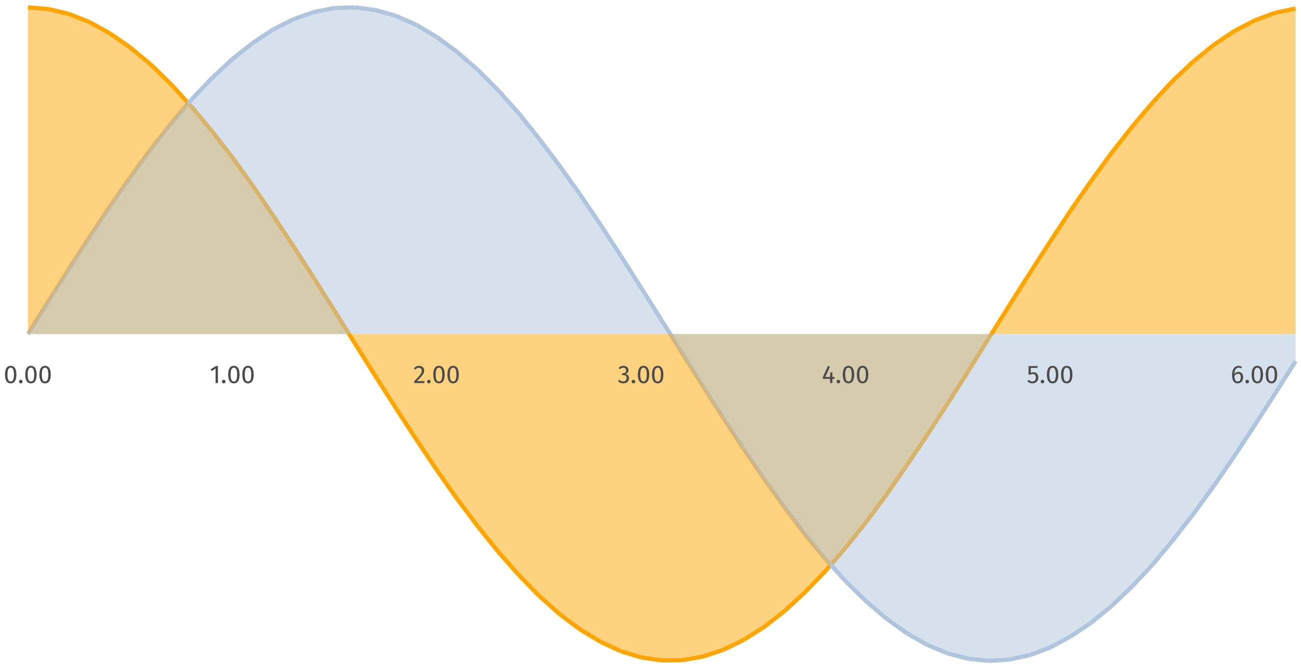
# Using dchart with decksh





```
cw=40                   // chart width
t=80                    // top
b=t-20                  // bottom
l1=5                    // volume chart left
r1=l1+cw                // volume chart right
l2=r1+10                // close chart left
r2=l2+cw                // close chart right

opts="-fulldeck=f -xlabel=2 -title=f -bar=f"
copts="-dot -line -csv -csvcol Date,Close"
dchart opts -vol  -top t -bottom b -left l1 -right r1 code/AAPL-vol.d
dchart opts copts -top t -bottom b -left l2 -right r2 code/AAPL.csv
text "APPL volume" l1 b 2
text "APPL close"  l2 b 2
arrow r2 b r2 t 0.2 2 1 "red"
etext "Peak Close" r2 b 1 "sans" "gray"
```

# Composite Charts



```
// go run mfunc.go -f cos > code/cos.d
// go run mfunc.go -f sin > code/sin.d
opts="-top=80 -bottom=60 -left=20 -right=80 -fulldeck=f -title=f -val=f -bar=f -line -vol"
dchart opts -xlabel=10 -color orange code/cos.d
dchart opts -xlabel=0                code/sin.d
```

# Command Line Options

# Chart Types

| | | |
|---|---|---|
| -bar | true | bar chart |
| -wbar | false | word bar chart |
| -hbar | false | horizontal bar chart |
| -donut | false | donut chart |
| -dot | false | dot chart |
| -lego | false | lego chart |
| -line | false | line chart |
| -pgrid | false | proportional grid |
| -pmap | false | proportional map |
| -bowtie | false | bowtie chart |
| -fan | false | fan chart |
| -radial | false | radial chart |
| -scatter | false | scatter chart |
| -slope | false | slope chart |
| -vol | false | volume (area) chart |

# Chart Elements

| | | |
|---|---|---|
| -csv | false | read CSV files |
| -frame | false | show a colored frame |
| -fulldeck | true | generate full deck markup |
| -grid | false | show gridlines on the y axis |
| -note | true | show annotations |
| -pct | false | show computed percentage |
| -rline | false | show a regression line |
| -solidpmap | false | show solid pmap colors |
| -spokes | false | show spokes in radial chart |
| -title | true | show the title |
| -val | true | show values |
| -xlast | false | show the last x label |
| -xstagger | false | stagger x axis labels |
| -yaxis | false | show a y axis |
| -chartitle | override title in data | specify the title |
| -datacond | low,high,color | conditional data colors |
| -hline | value,label | label horizontal line at value |
| -valpos | t=top, b=bottom, m=middle | value position |
| -xlabel | default=1, 0 to suppress | x axis label interval |
| -yrange | min,max.step | specify the y axis label range |

# Position and Scaling

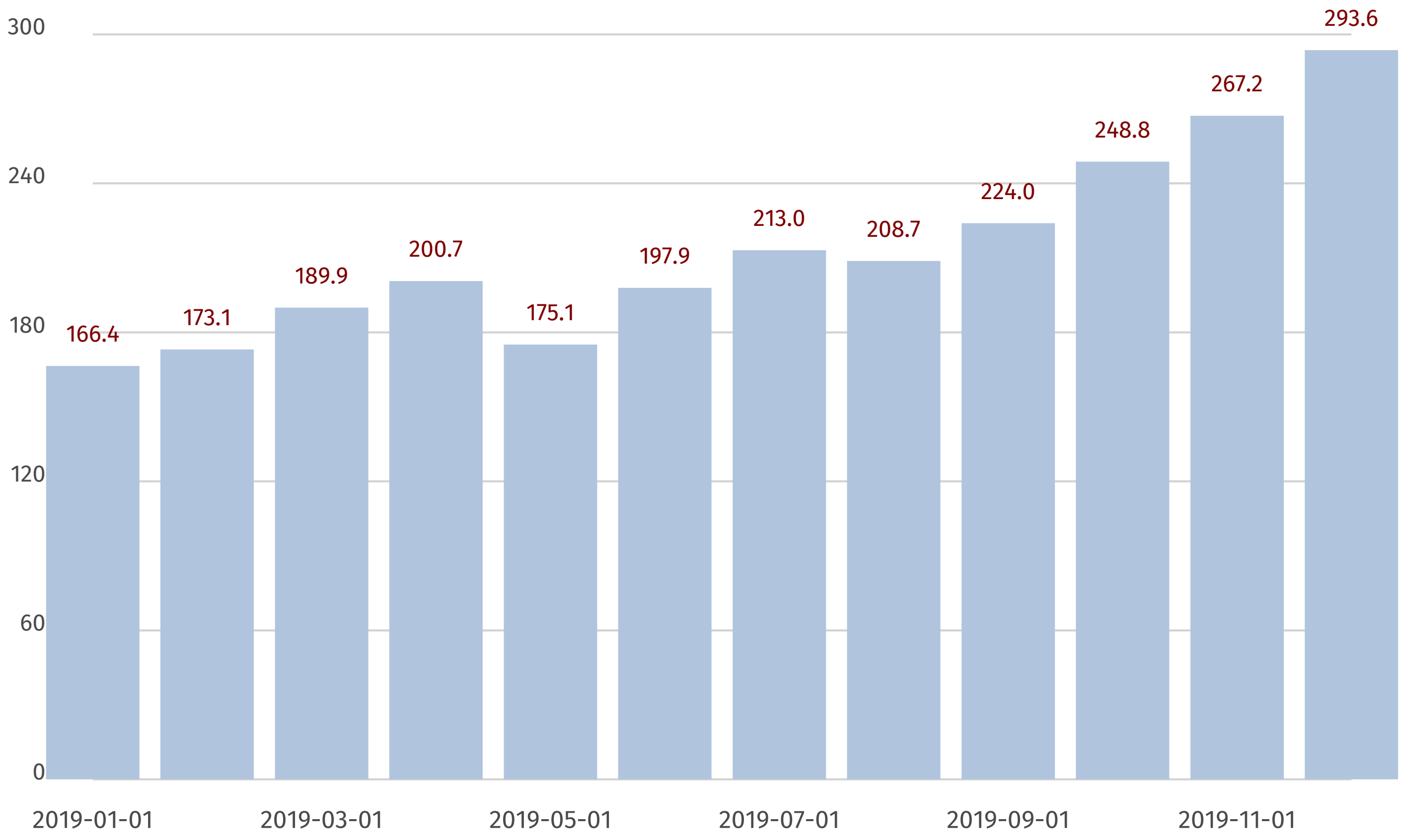
| | | |
|---|---|---|
| -top | 80 | top of the chart |
| -bottom | 30 | bottom of the chart |
| -left | 20 | left margin |
| -right | 80 | right margin |
| -min | data min | set the minimum data value |
| -max | data max | set the maximum data value |

# Measures and Attributes

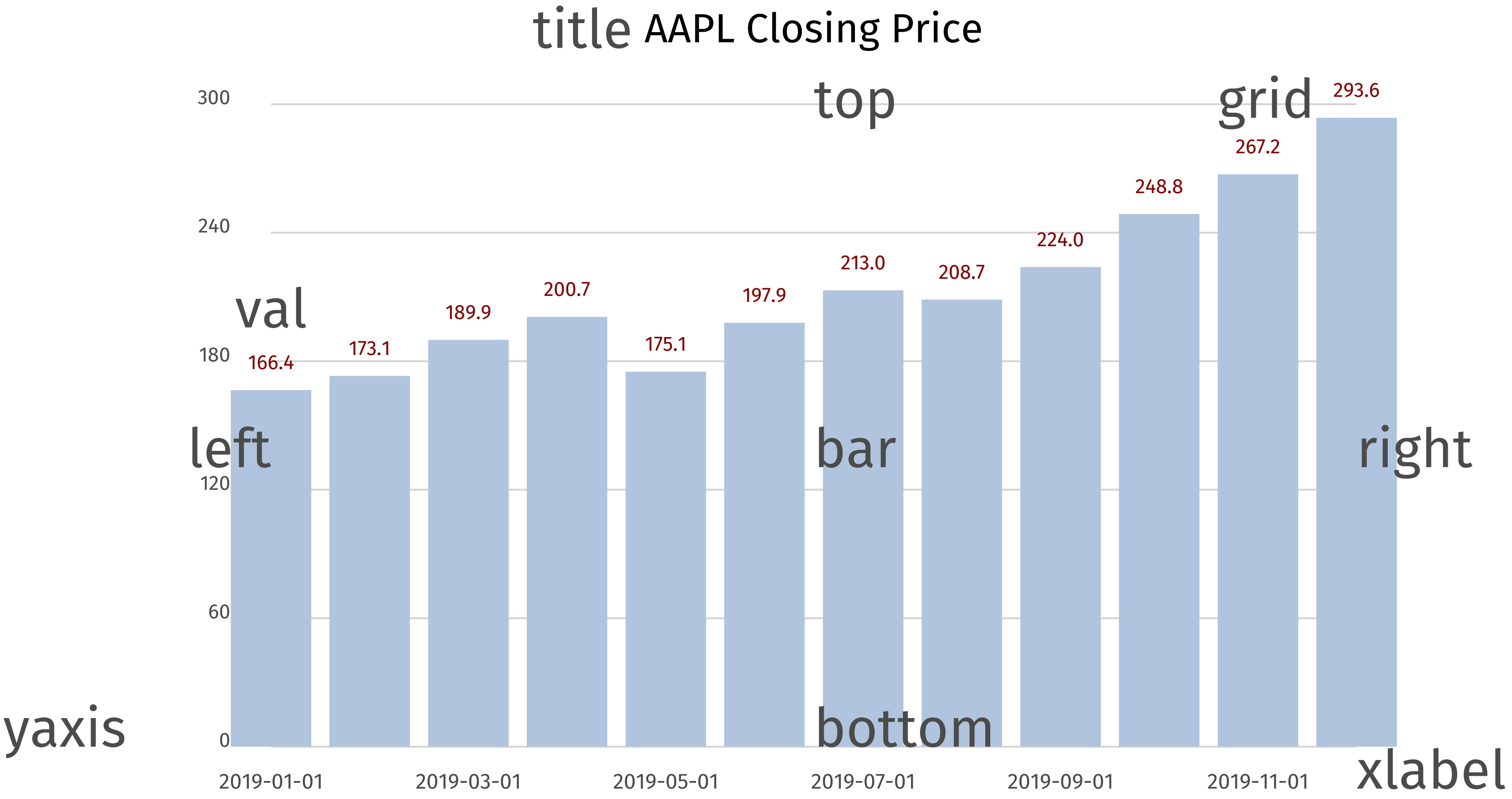
| | | |
|---|---|---|
| -bgcolor | white | background color |
| -barwidth | computed from data size | barwidth |
| -color | lightsteelblue | data color |
| -csvcol | labe1,label2 | specify csv columns |
| -datafmt | %.1f | data format for values |
| -dmin | false | use data minimum, not zero |
| -framecolor | rgb(127,127,127) | frame color |
| -lcolor | rgb(75,75,75) | label color |
| -linewidth | 0.2 | linewidth |
| -ls | 2.4 | linespacing |
| -noteloc | c=center, r=right, l=left | annotation location |
| -pmlen | 20 | pmap label length |
| -psize | 30 | diameter of the donut |
| -pwidth | 3 | width of the donut or pmap |
| -rlcolor | rgb(127,0,0) | regression line color |
| -textsize | 1.5 | text size |
| -xlabrot | 0 | xlabel rotation (deg.) |
| -vcolor | rgb(127,0,0) | value color |
| -volop | 50 | volume opacity % |

# Command Examples

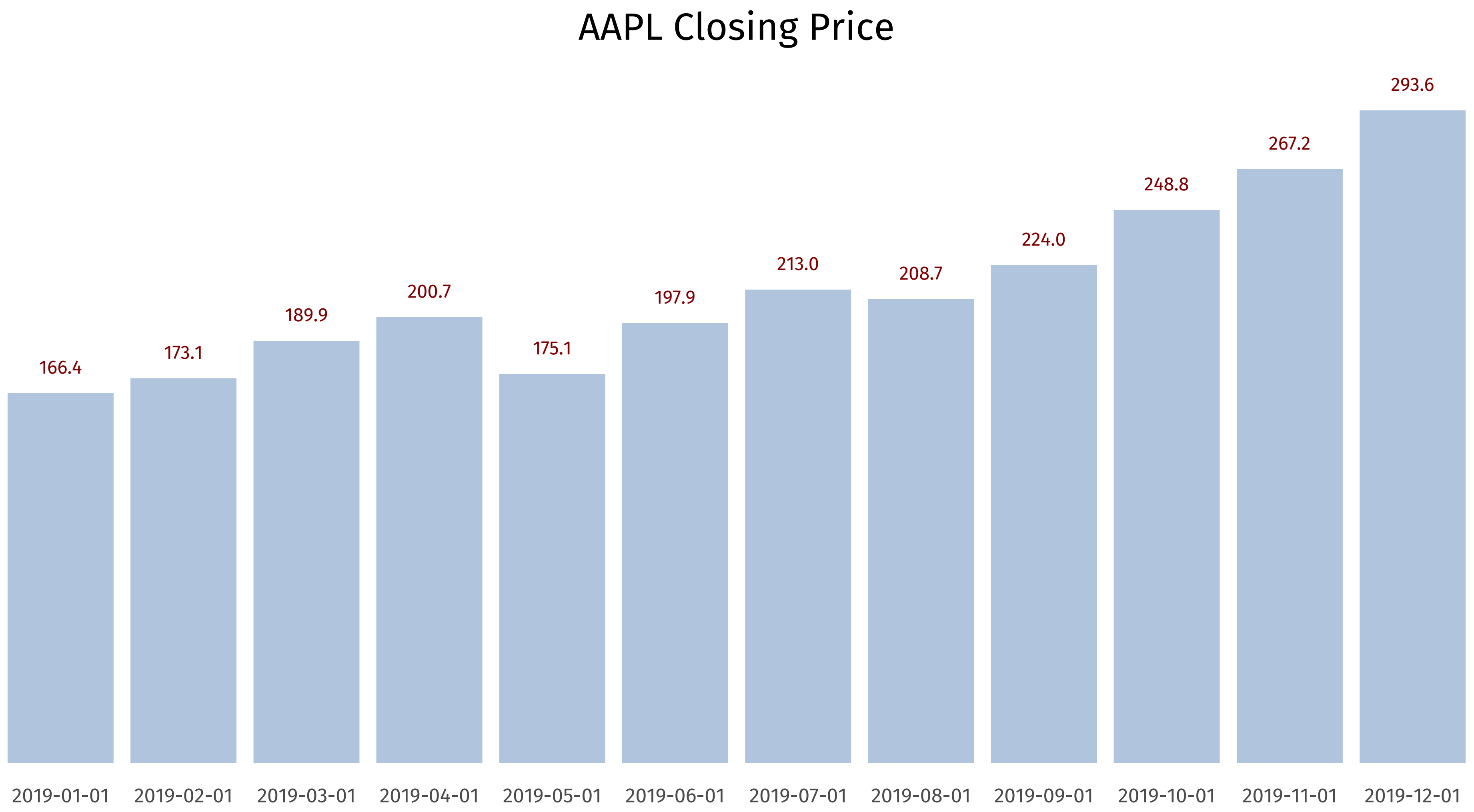
AAPL Closing Price



# Chart Attributes

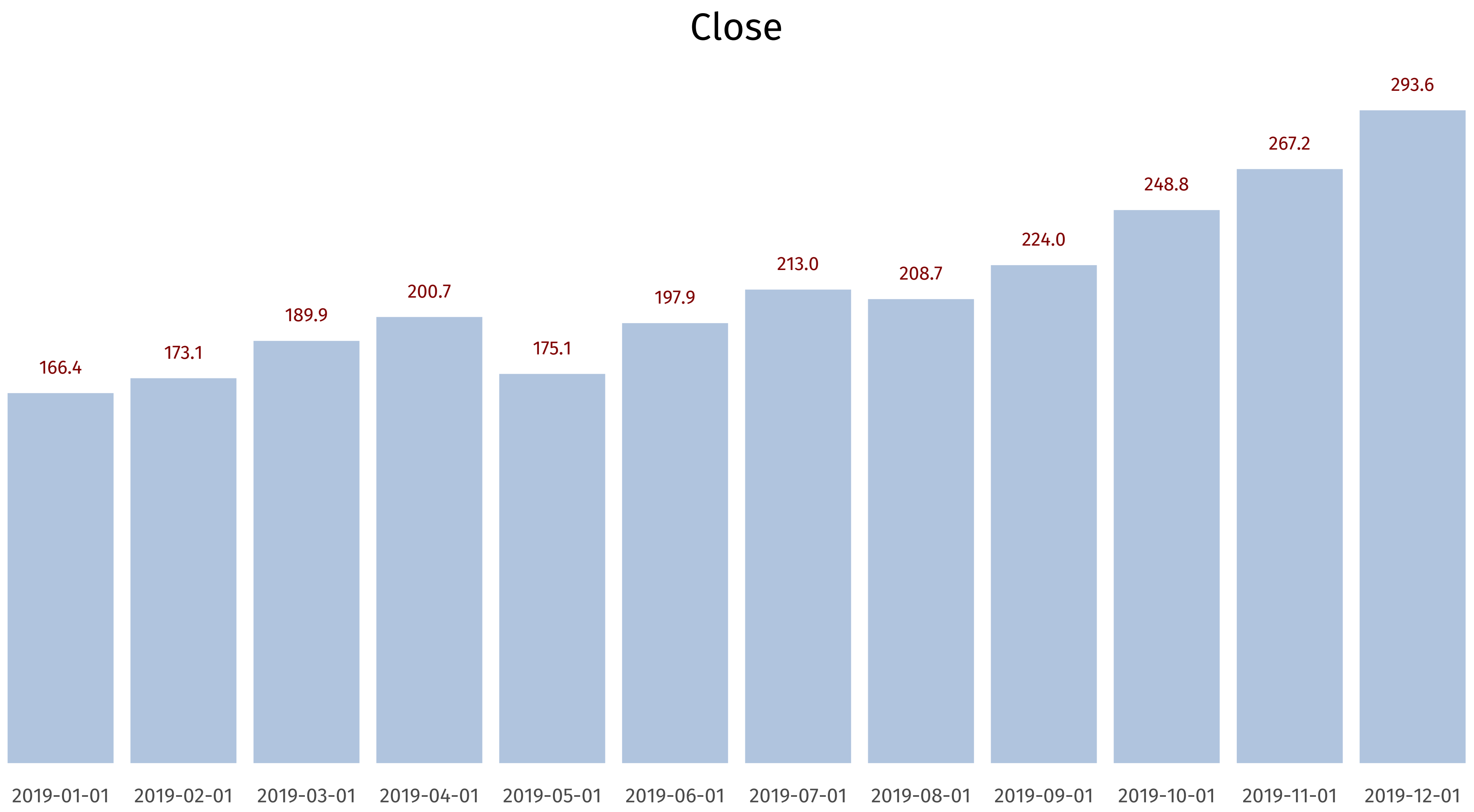


```
dchart -left=20 -right=80 -top=75 -bottom=30 -yaxis -grid -xlabel=2 -val AAPL.d
```



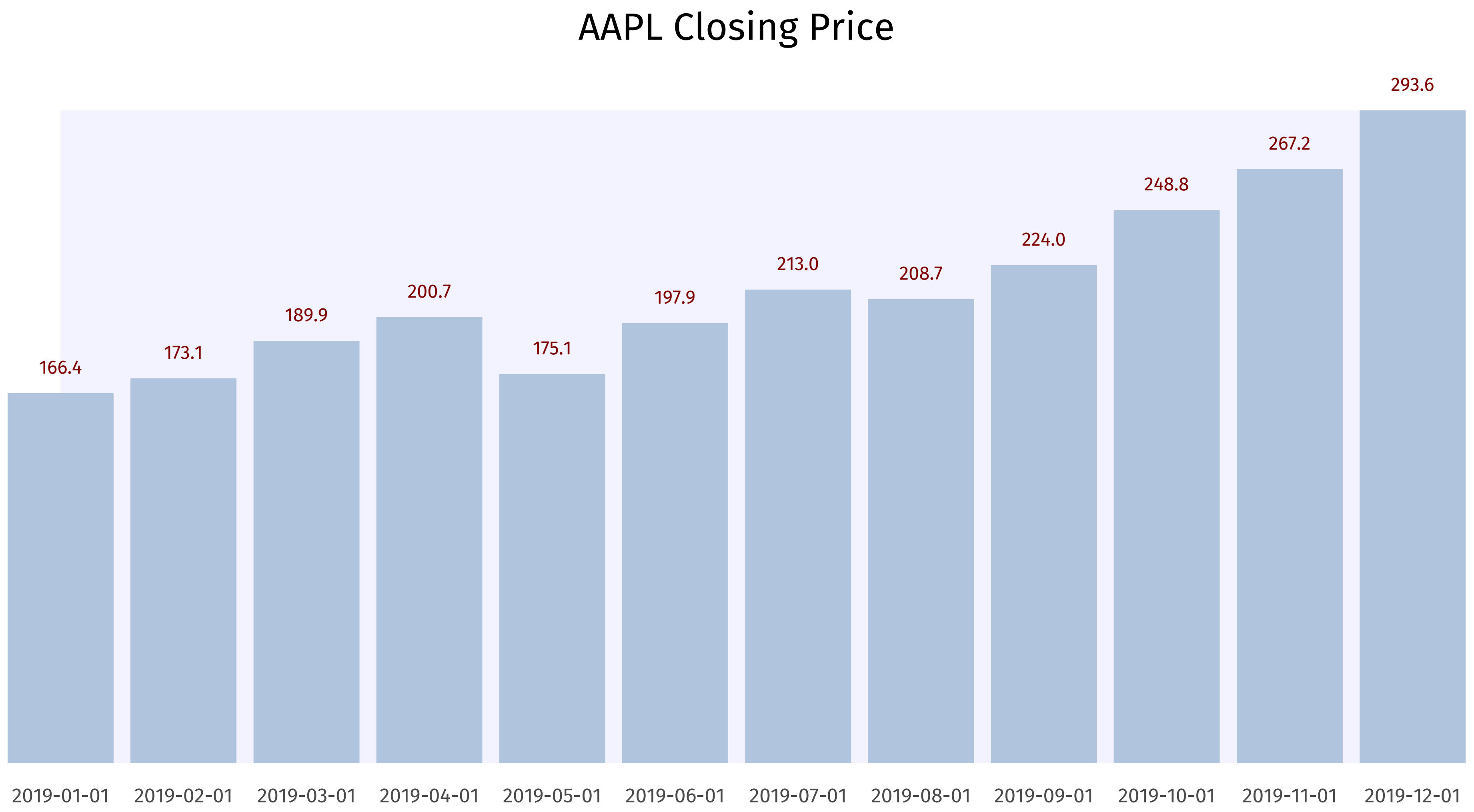
# Default Bar Chart

```
dchart AAPL.d
```



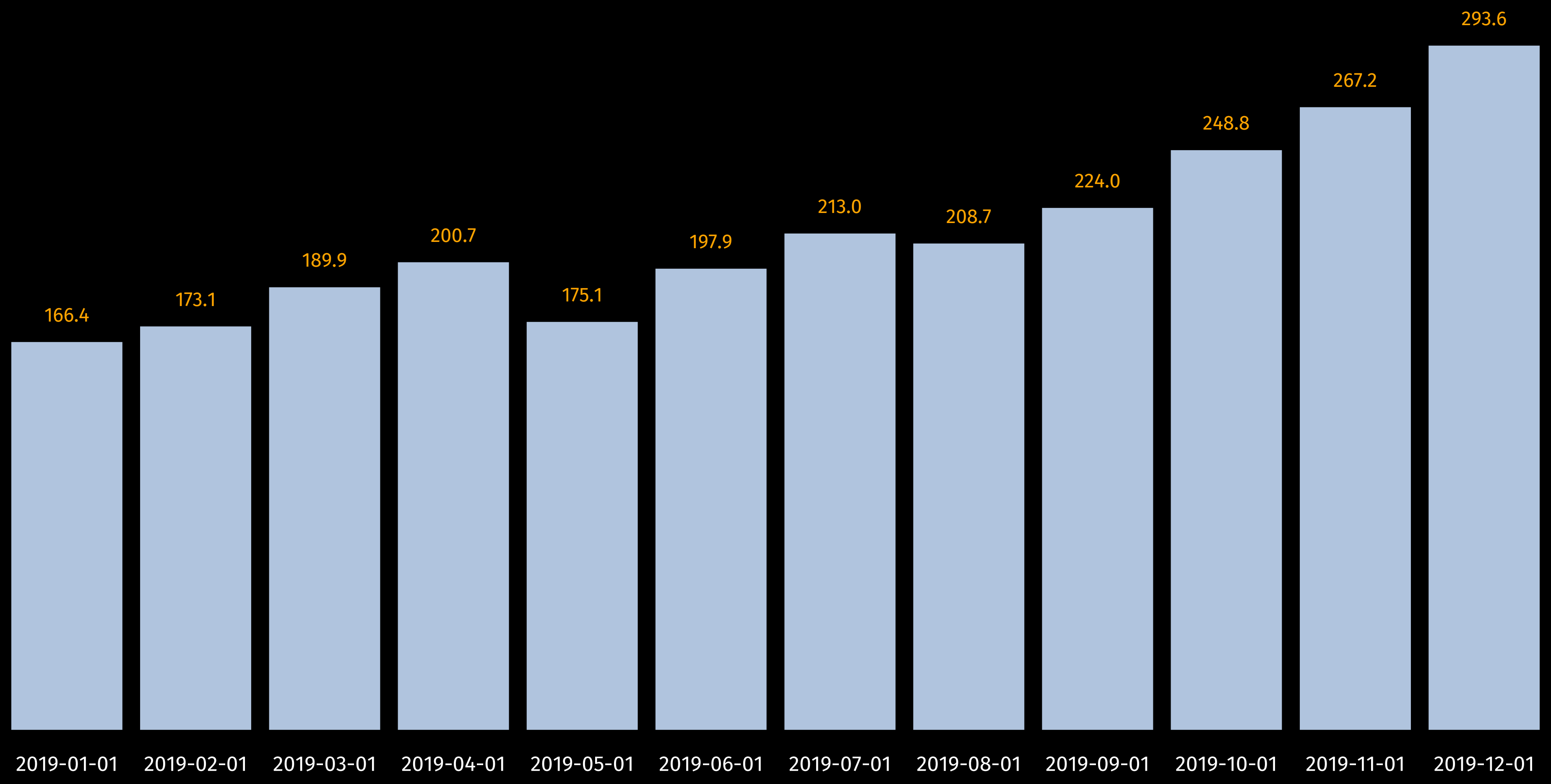
# Reading CSV files

```
dchart -csv -csvcol=Date,Close AAPL.csv
```



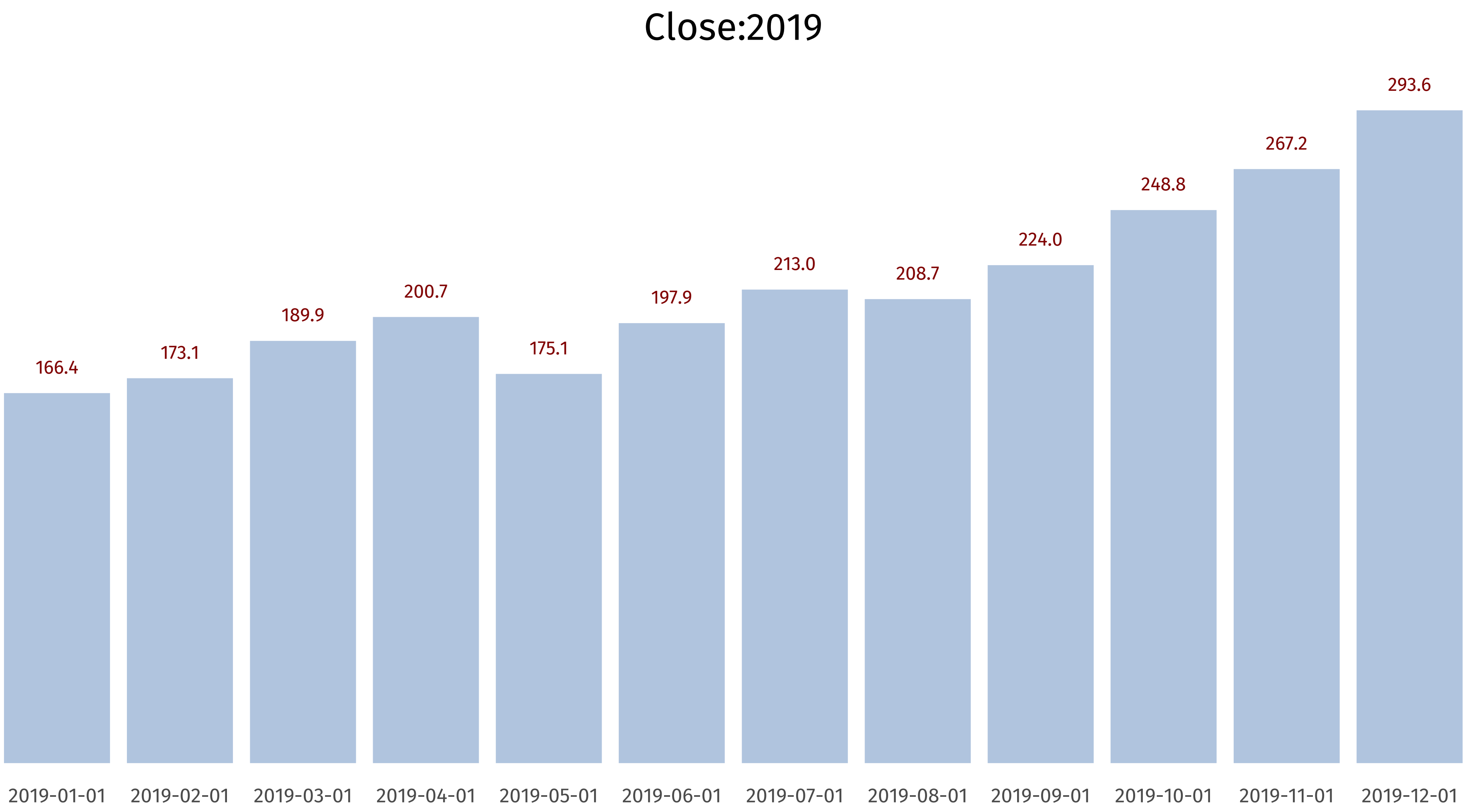
# Frame, Frame Color

```
dchart -frame=t -framecolor=blue AAPL.d
```



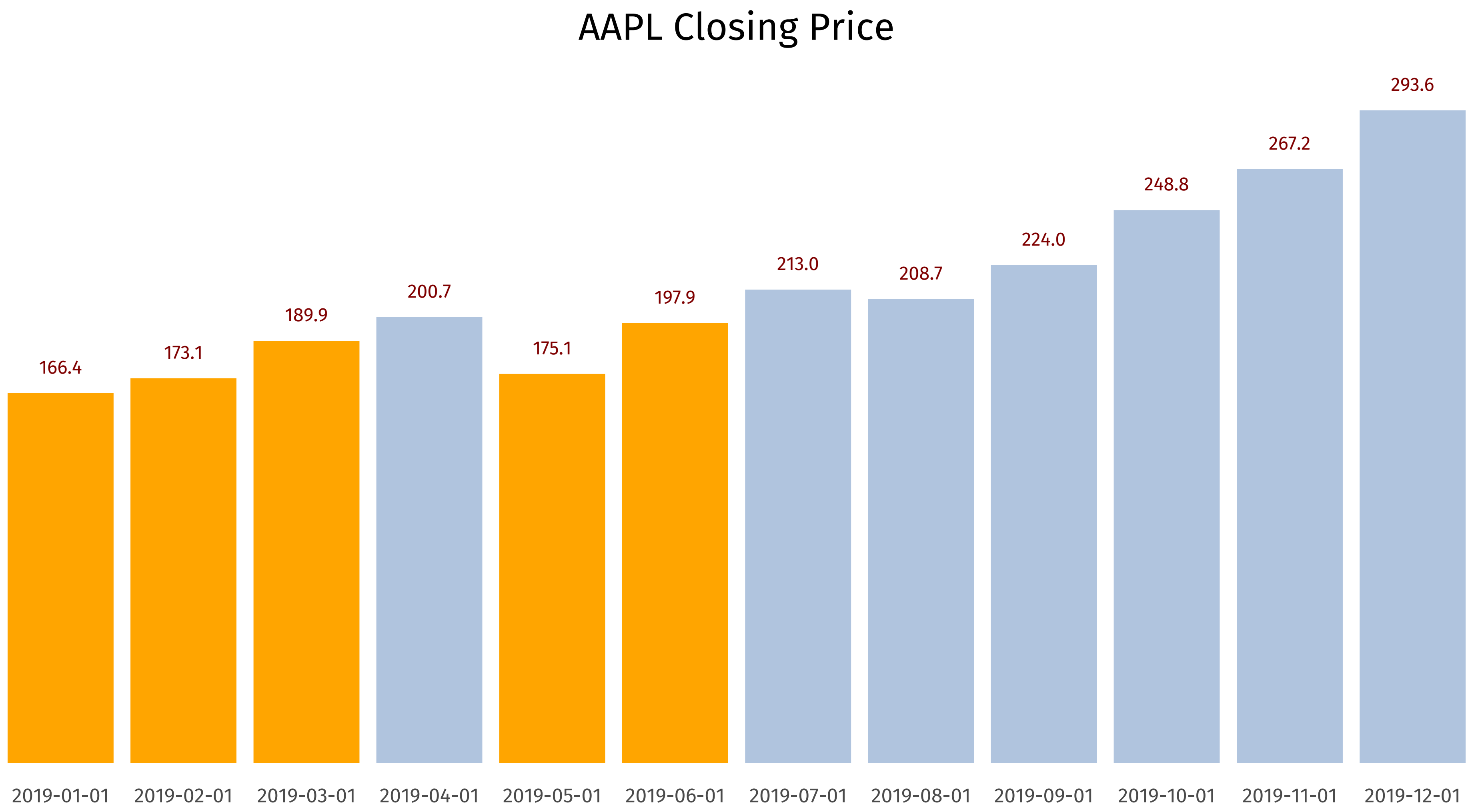
# Background, Label, Value Color

```
dchart -bgcolor=black -lcolor=white -vcolor=orange AAPL.d
```



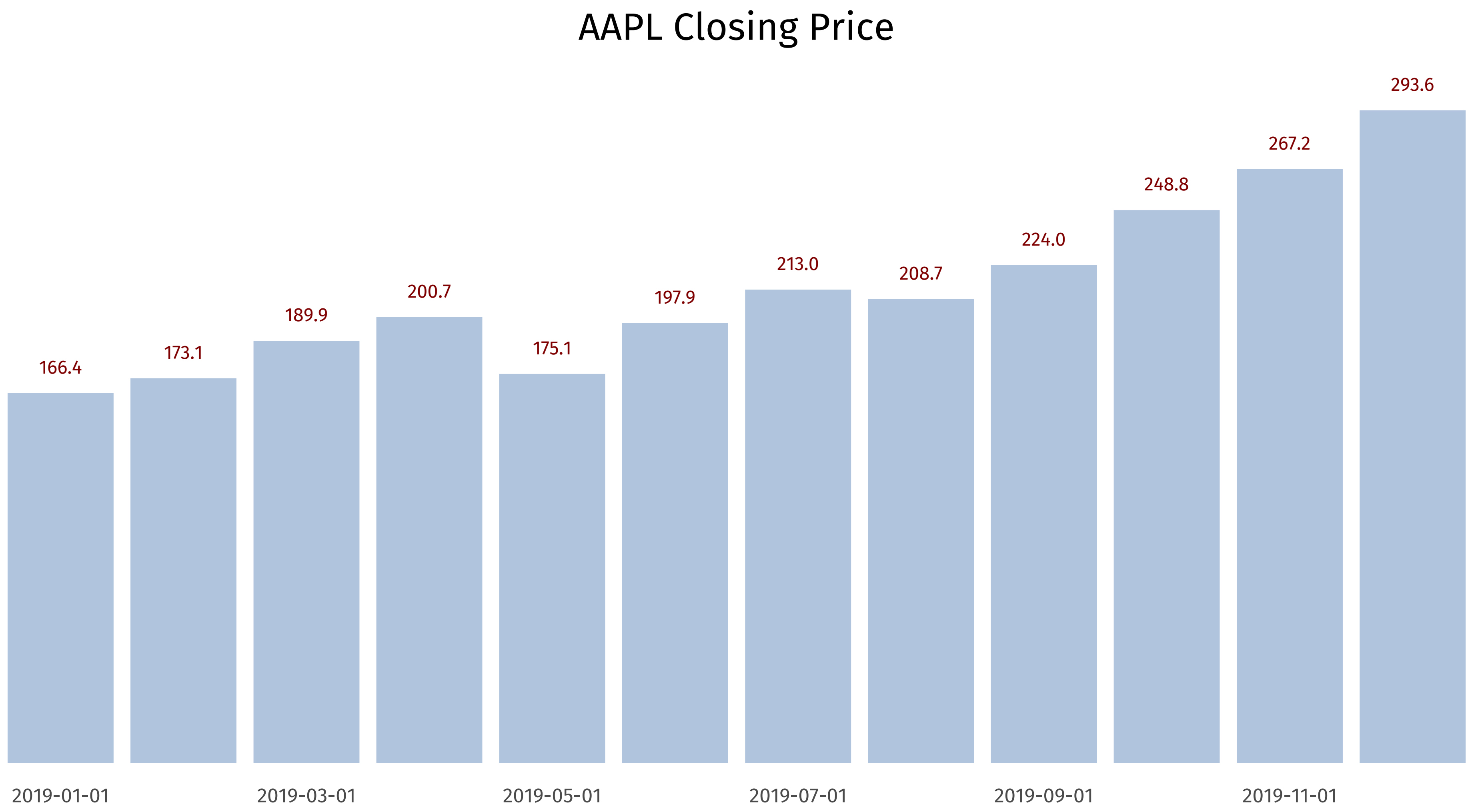
# Chart Title

```
dchart -chartitle="Close:2019" AAPL.d
```



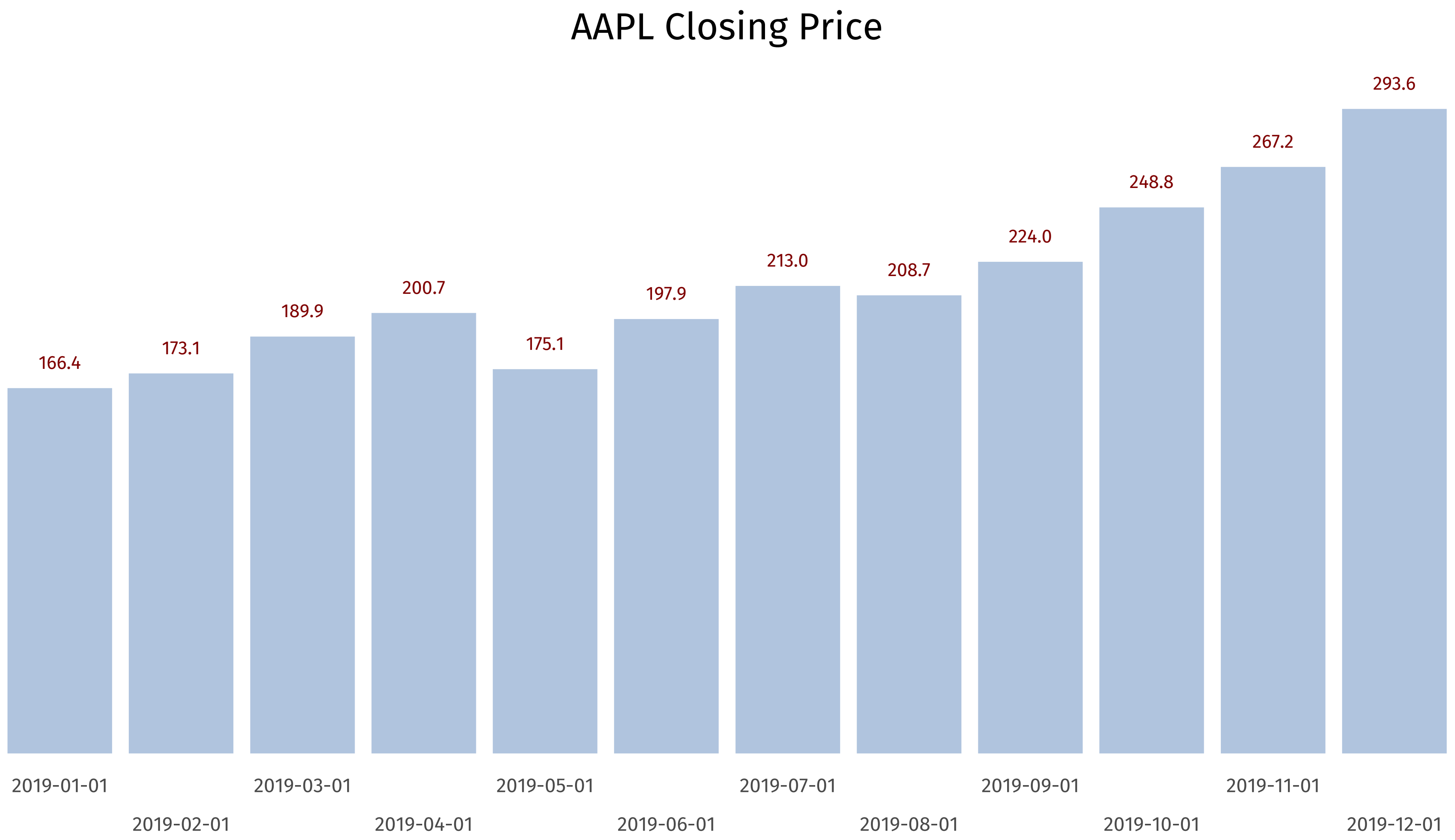
# Data Conditions

```
dchart -datacond=150,200,orange AAPL.d
```



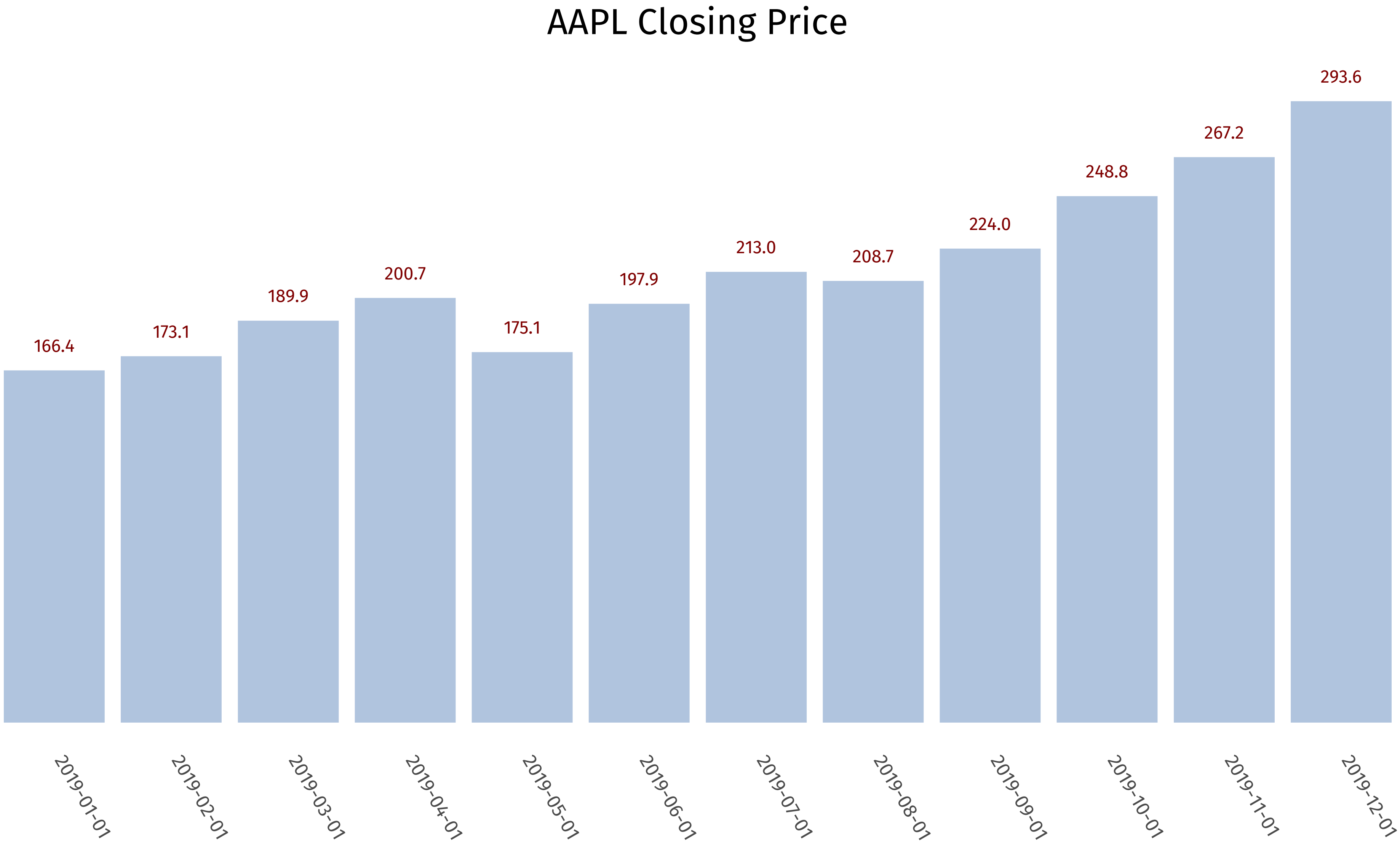
# X-Axis Label Interval

```
dchart -xlabel=2 AAPL.d
```



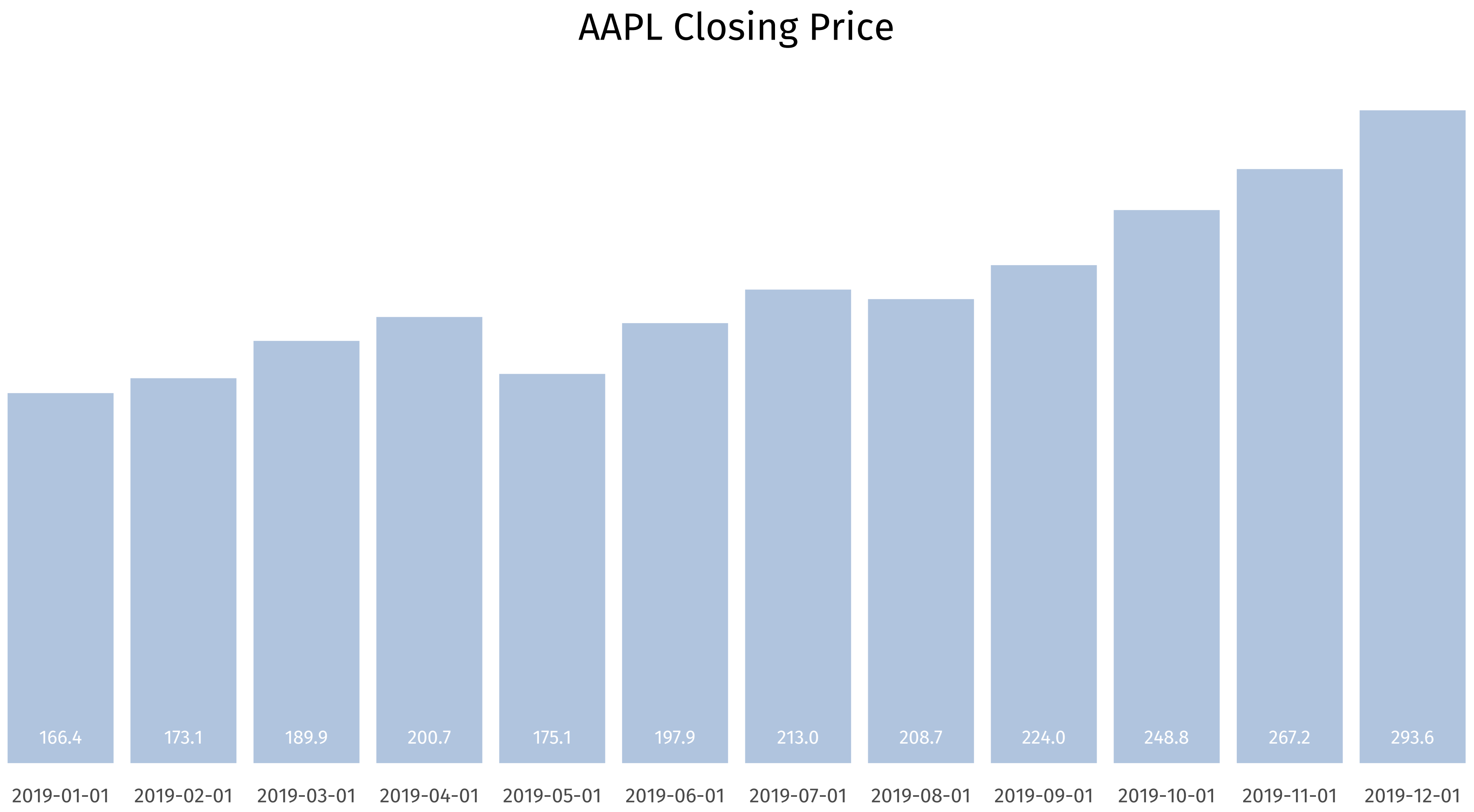
# Stagger X-Axis Labels

```
dchart -xstagger AAPL.d
```



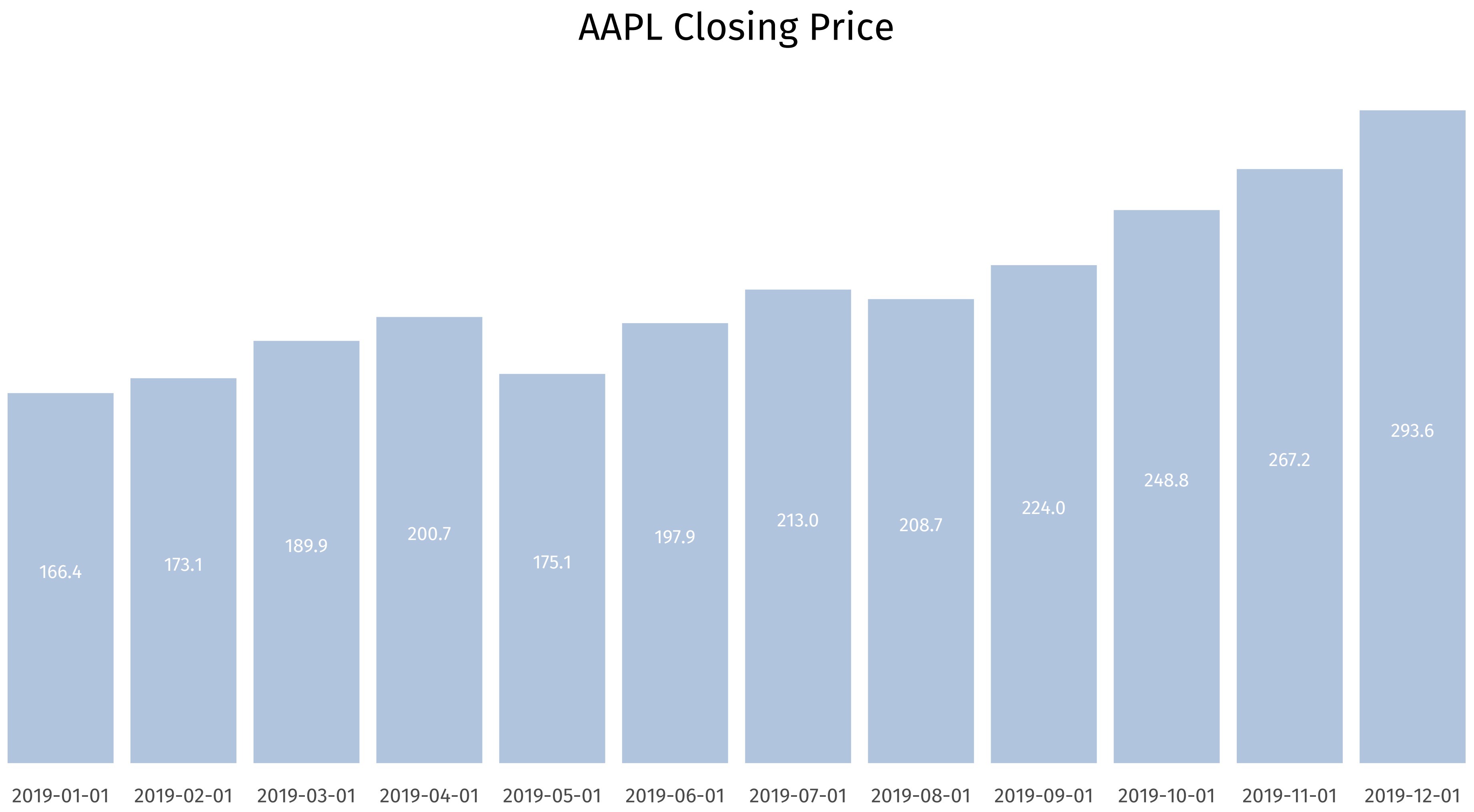
# X-Axis Label Rotation

```
dchart -xlabrot=300 AAPL.d
```



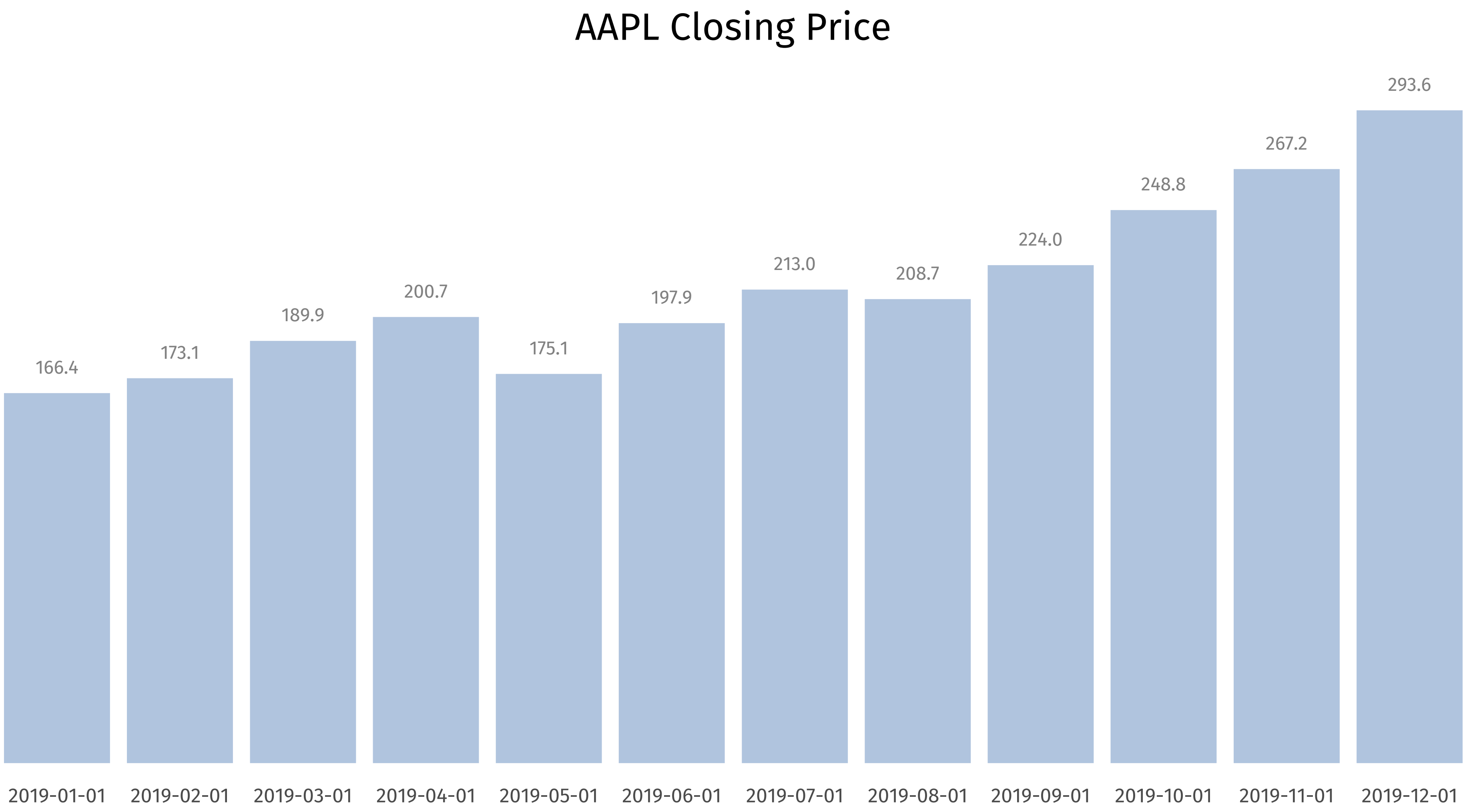
# Value Color, Value Position Bottom

```
dchart -vcolor=white -valpos=b AAPL.d
```



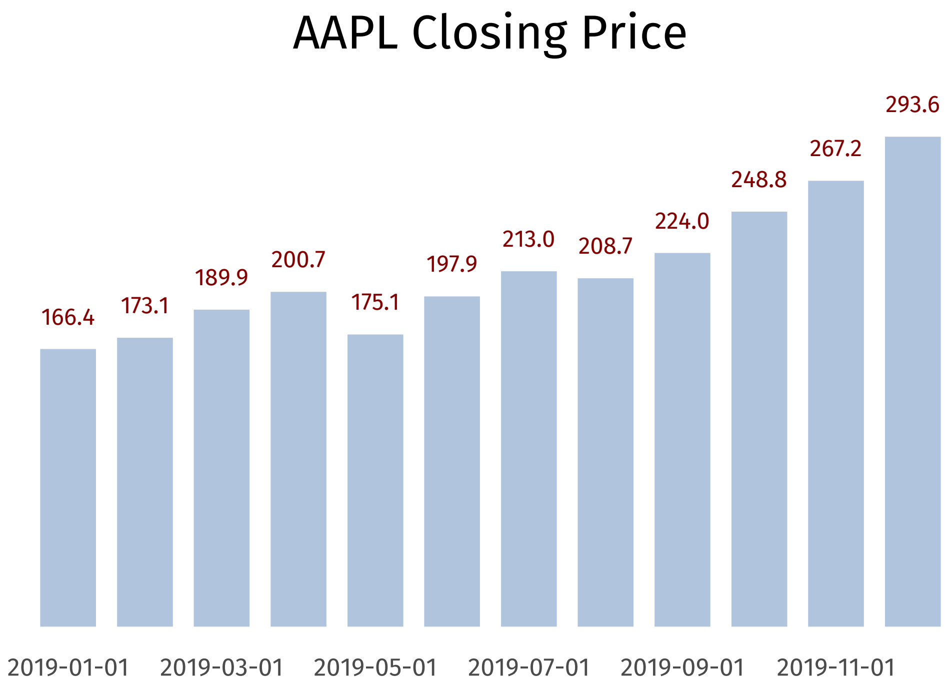
# Value Color, Value Position Middle

```
dchart -vcolor=white -valpos=m AAPL.d
```



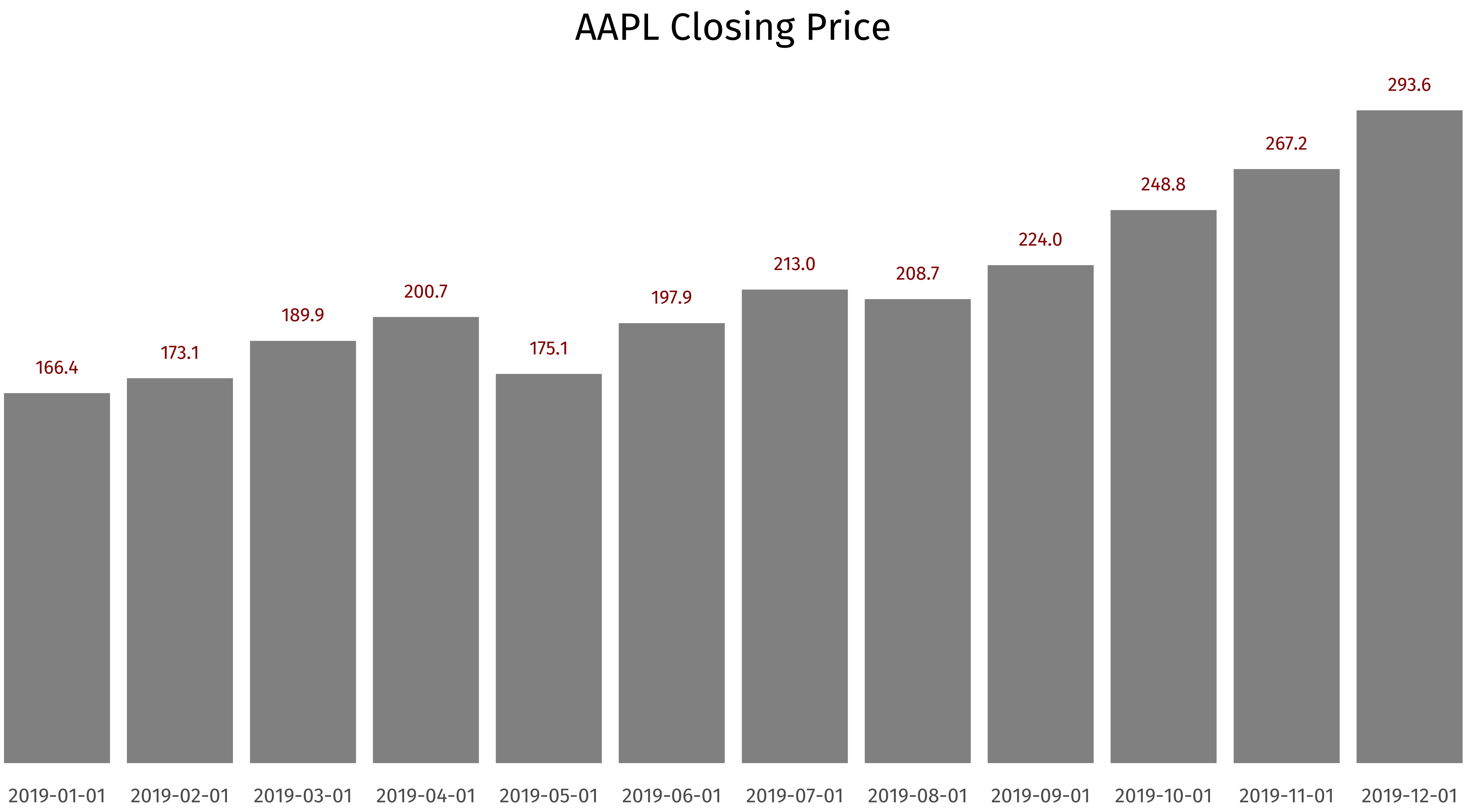
# Value Color, Value Position Top

```
dchart -vcolor=gray AAPL.d
```



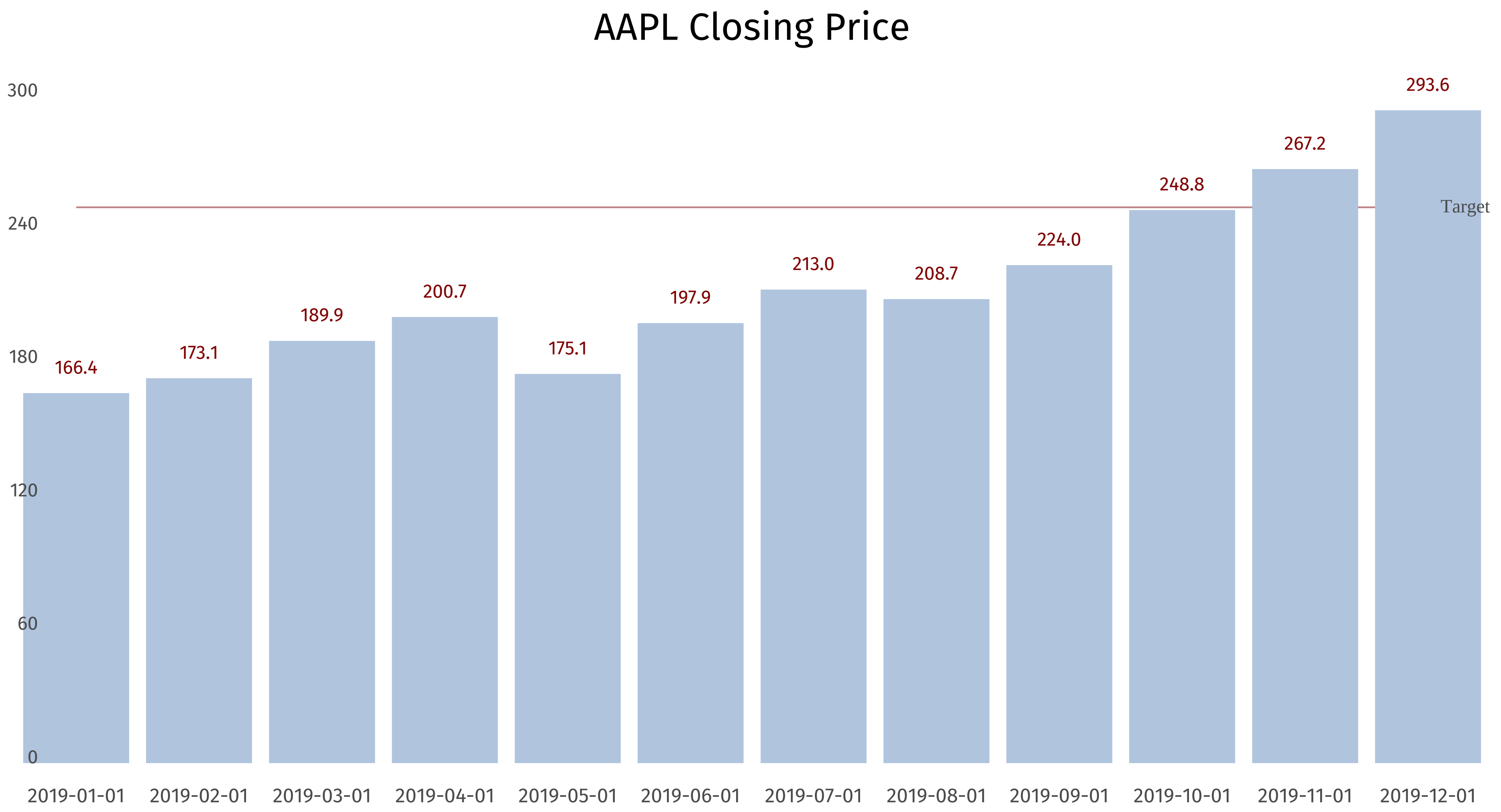
# Scaling

```
dchart -xlabel=2 -left 30 -right 70 -top 70 -bottom 40 AAPL.d
```



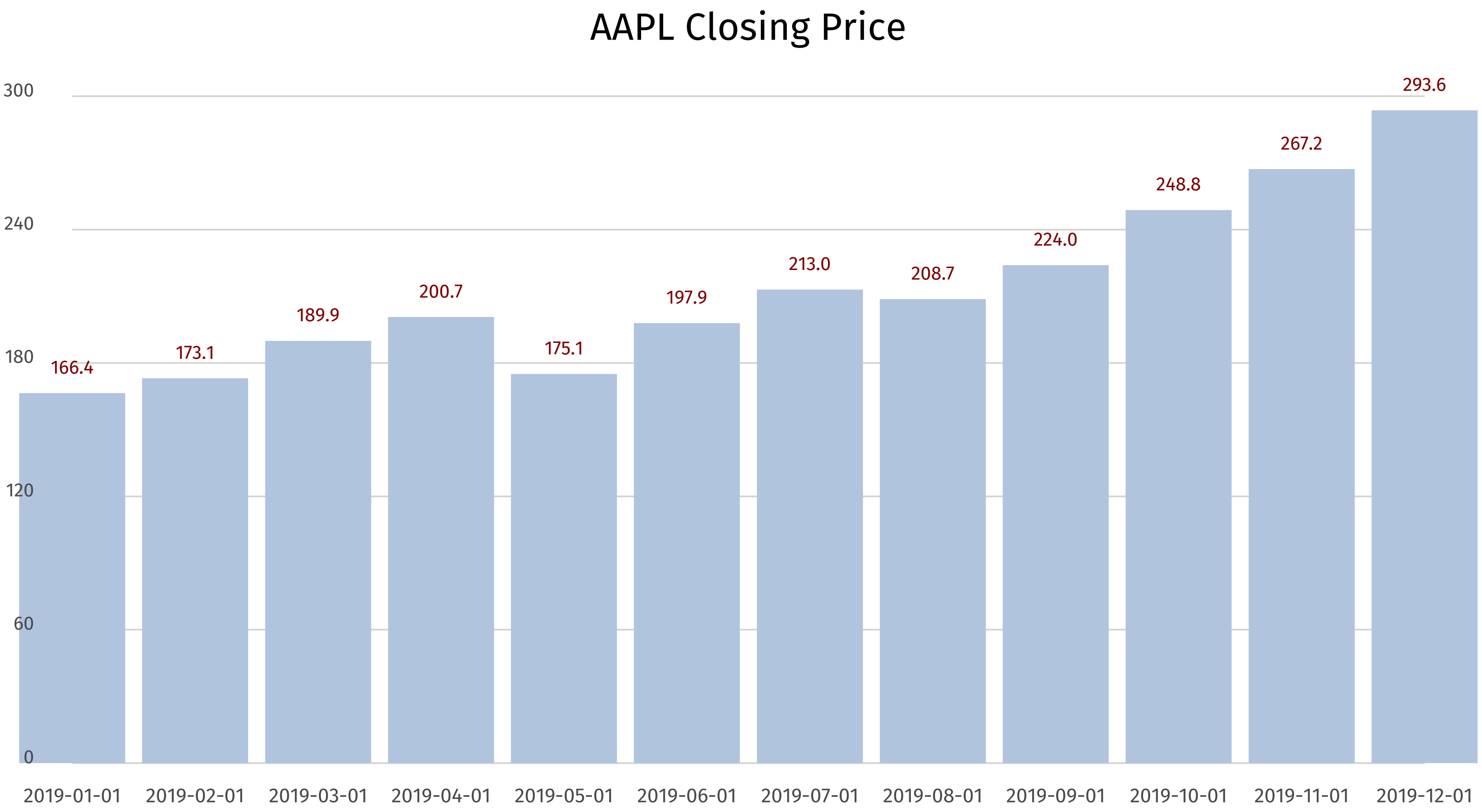
# Color

```
dchart -color gray AAPL.d
```



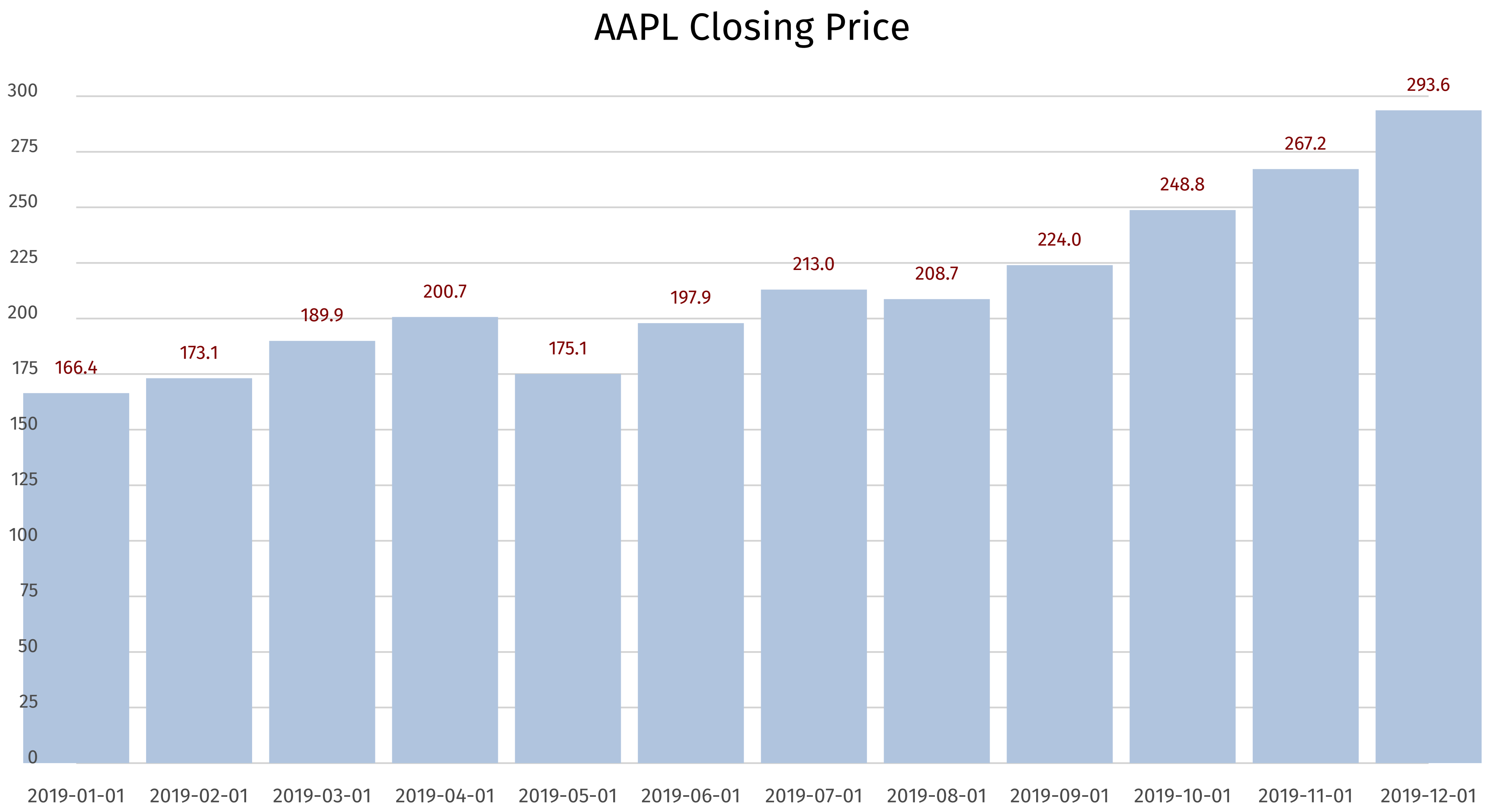
# Target Line, Y-Axis

```
dchart -hline=250,Target -yaxis AAPL.d
```



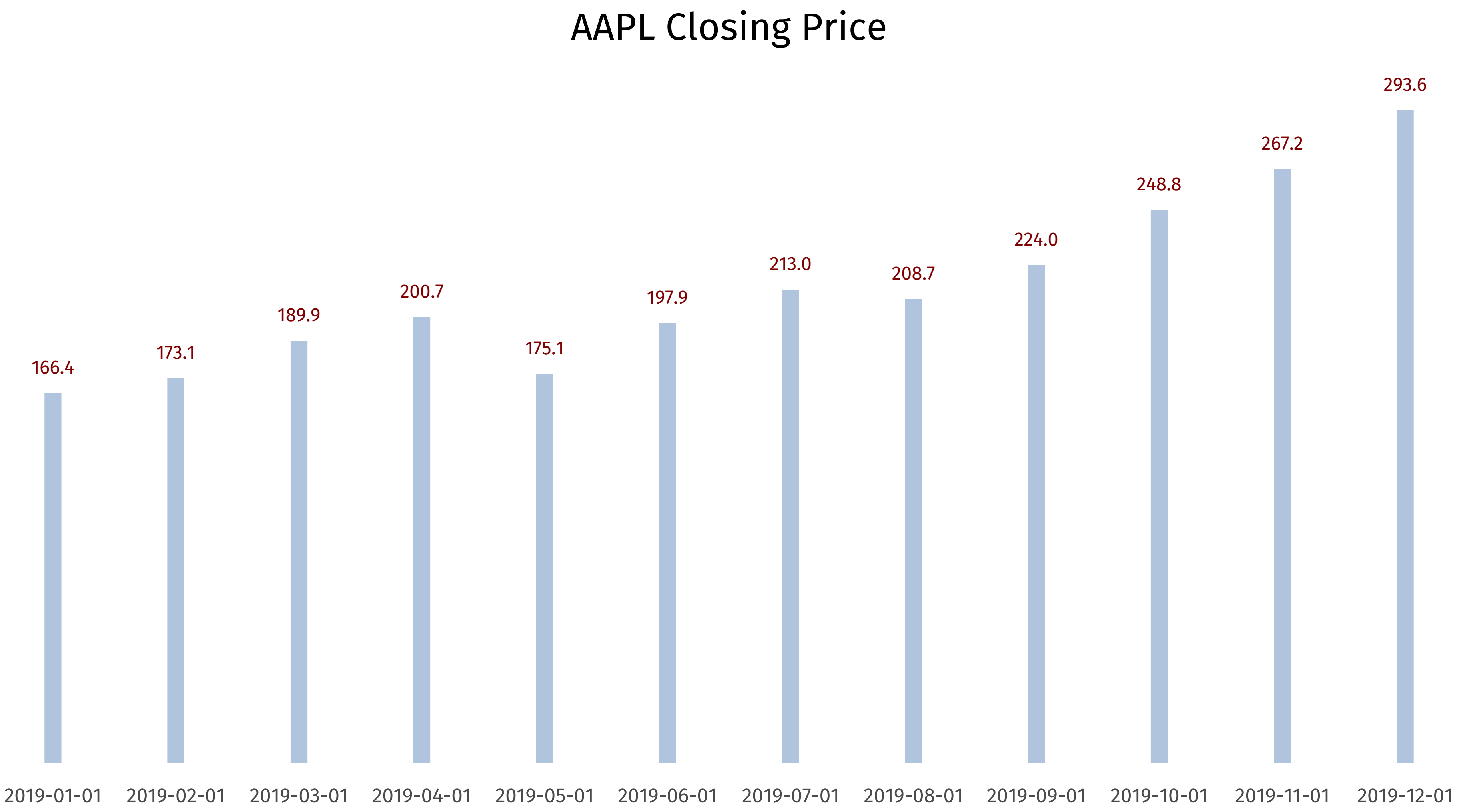
# Y-Axis, Grid

```
dchart -grid -yaxis AAPL.d
```



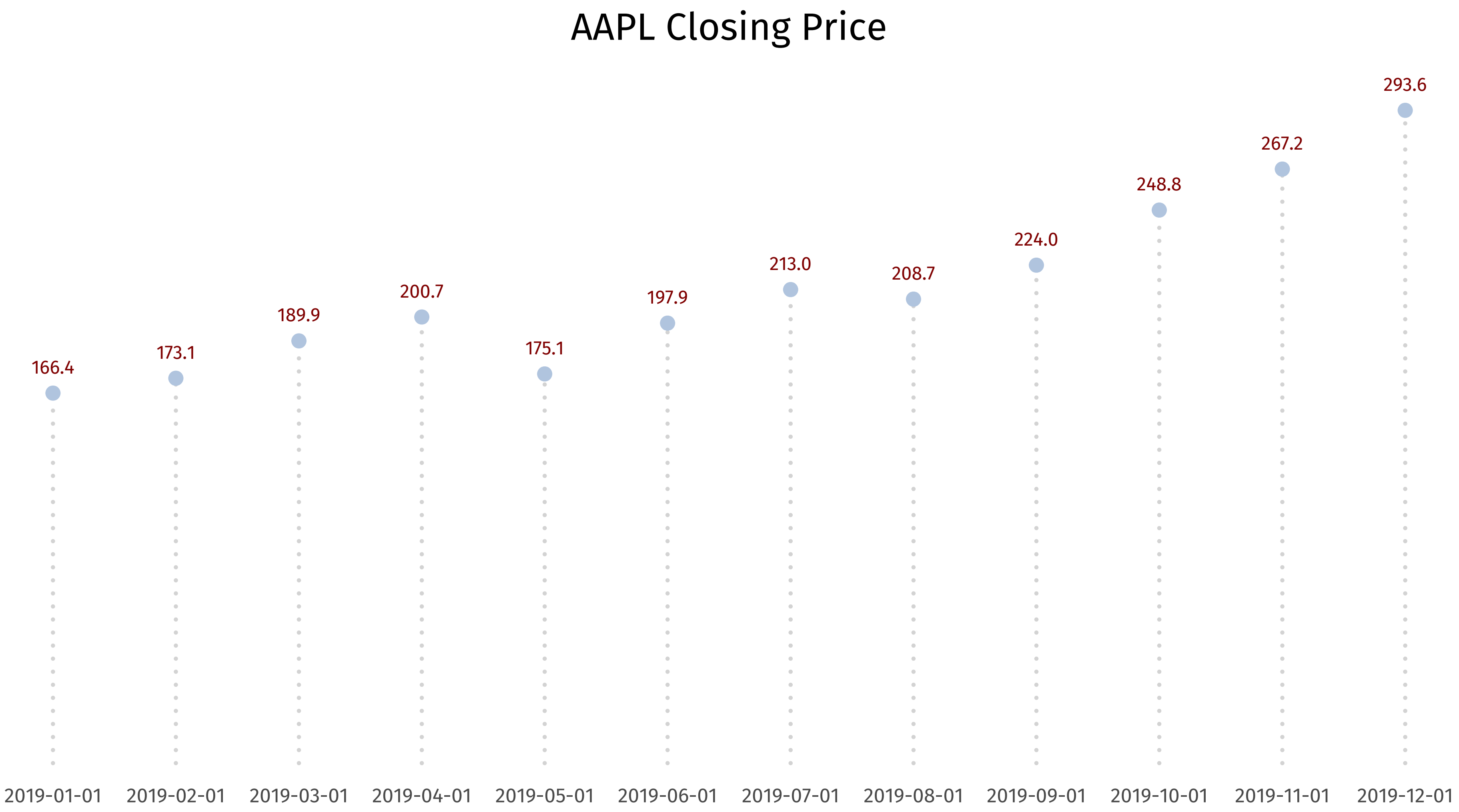
# Y-Range

```
dchart -yrange=0,300,25 -grid -yaxis AAPL.d
```



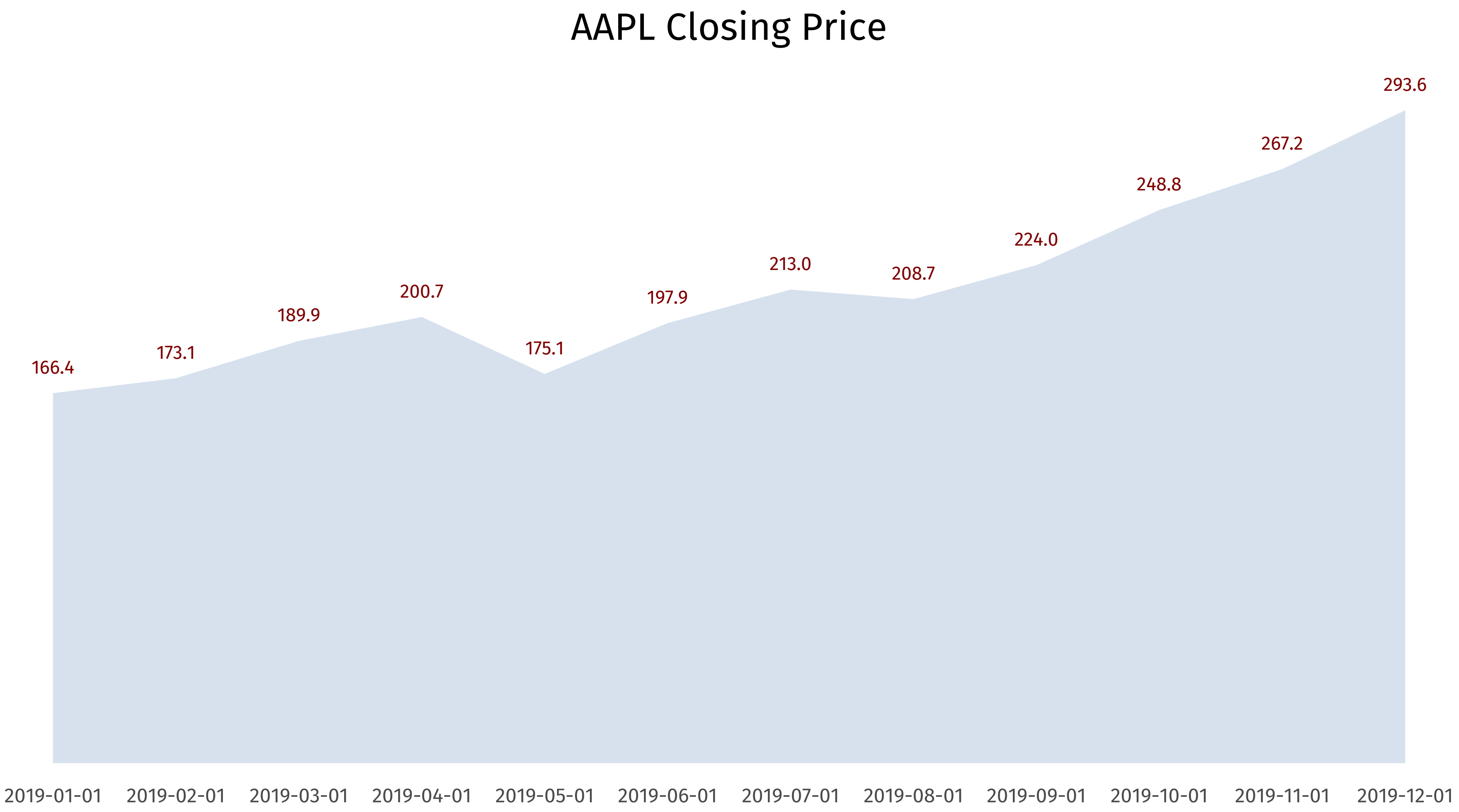
# Adjusting Bar Width

```
dchart -barwidth=1 AAPL.d
```



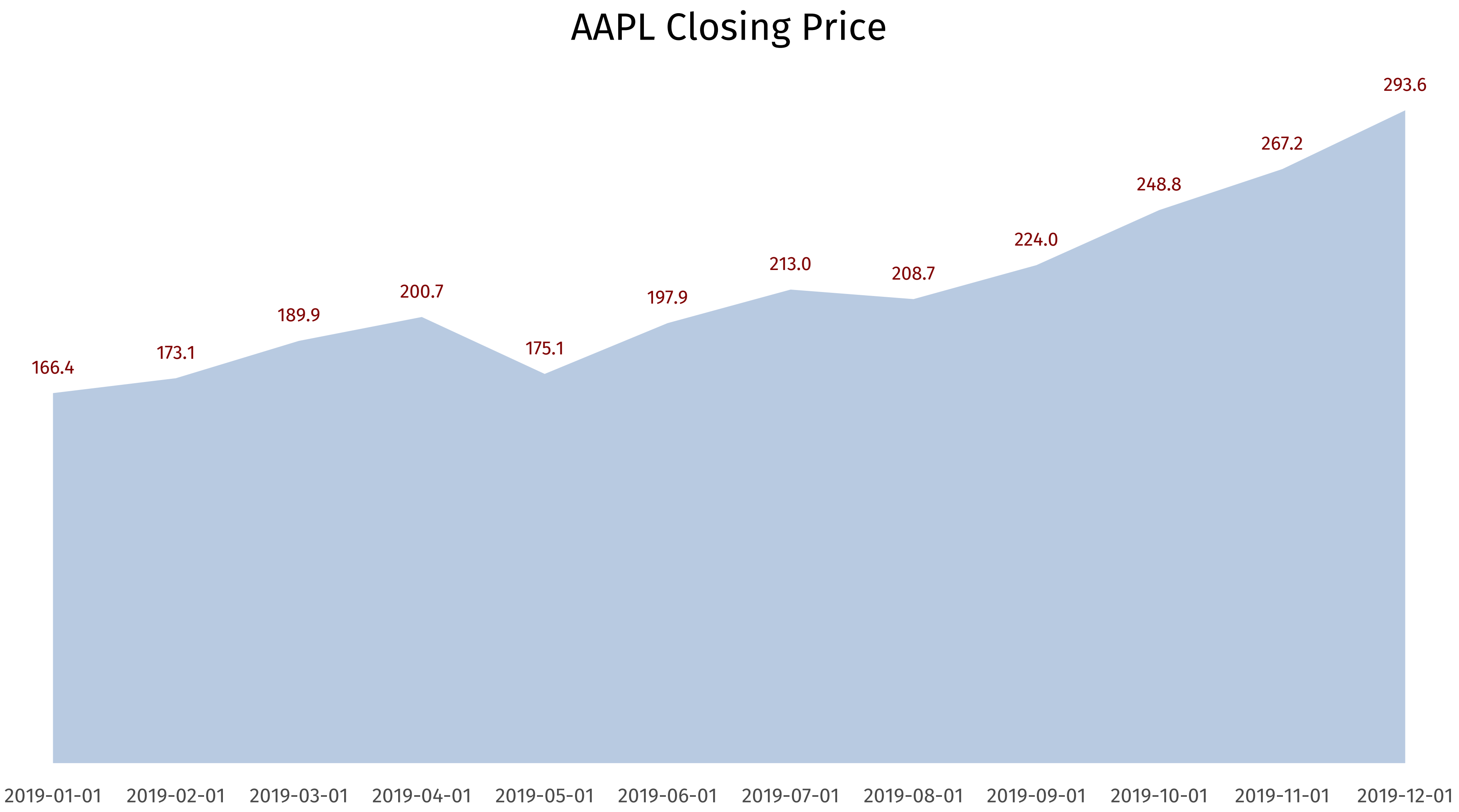
# Dot Chart

```
dchart -bar=f -dot AAPL.d
```



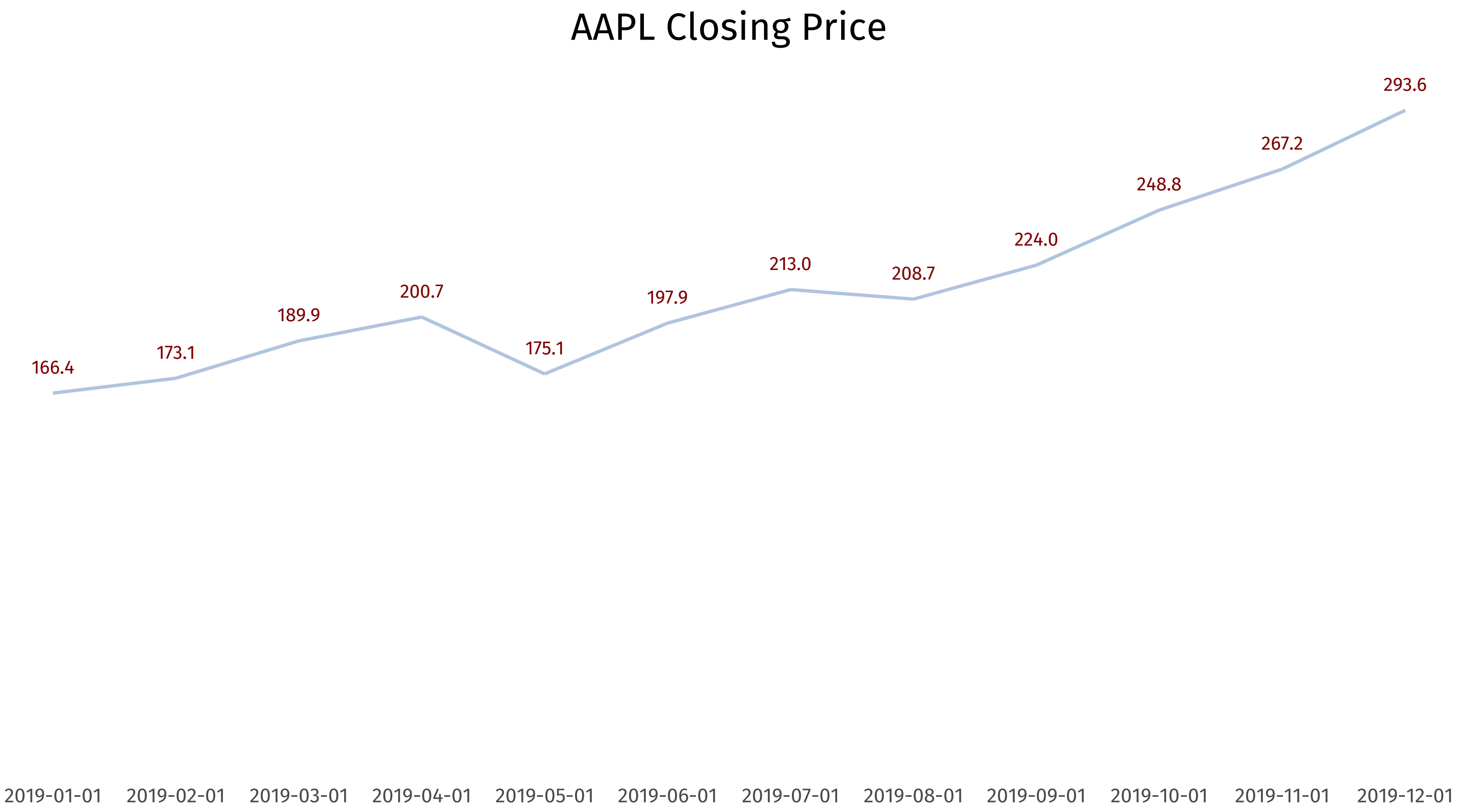
# Area Chart

```
dchart -bar=f -vol AAPL.d
```



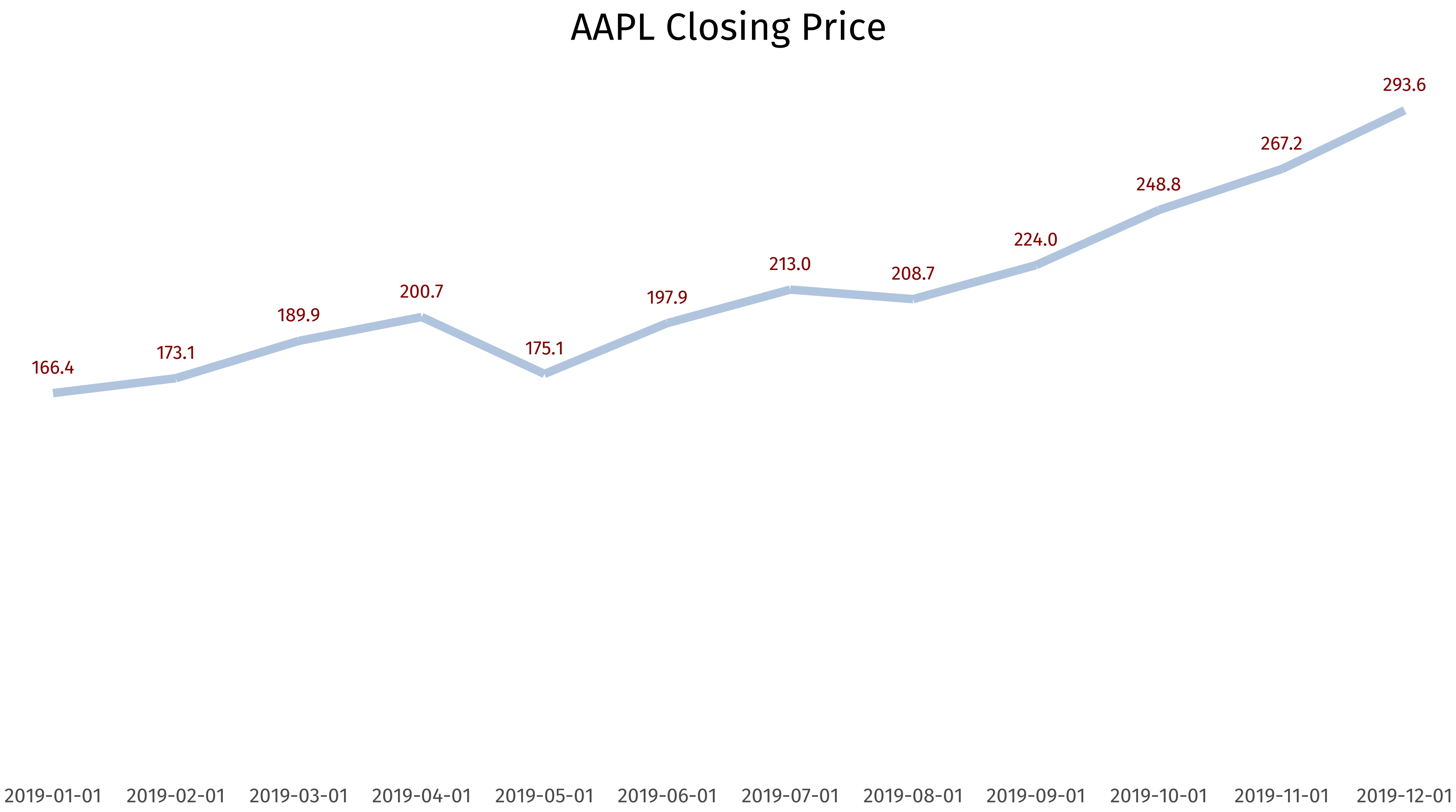
# Area Chart, Opacity

```
dchart -bar=f -vol -volop=90 AAPL.d
```



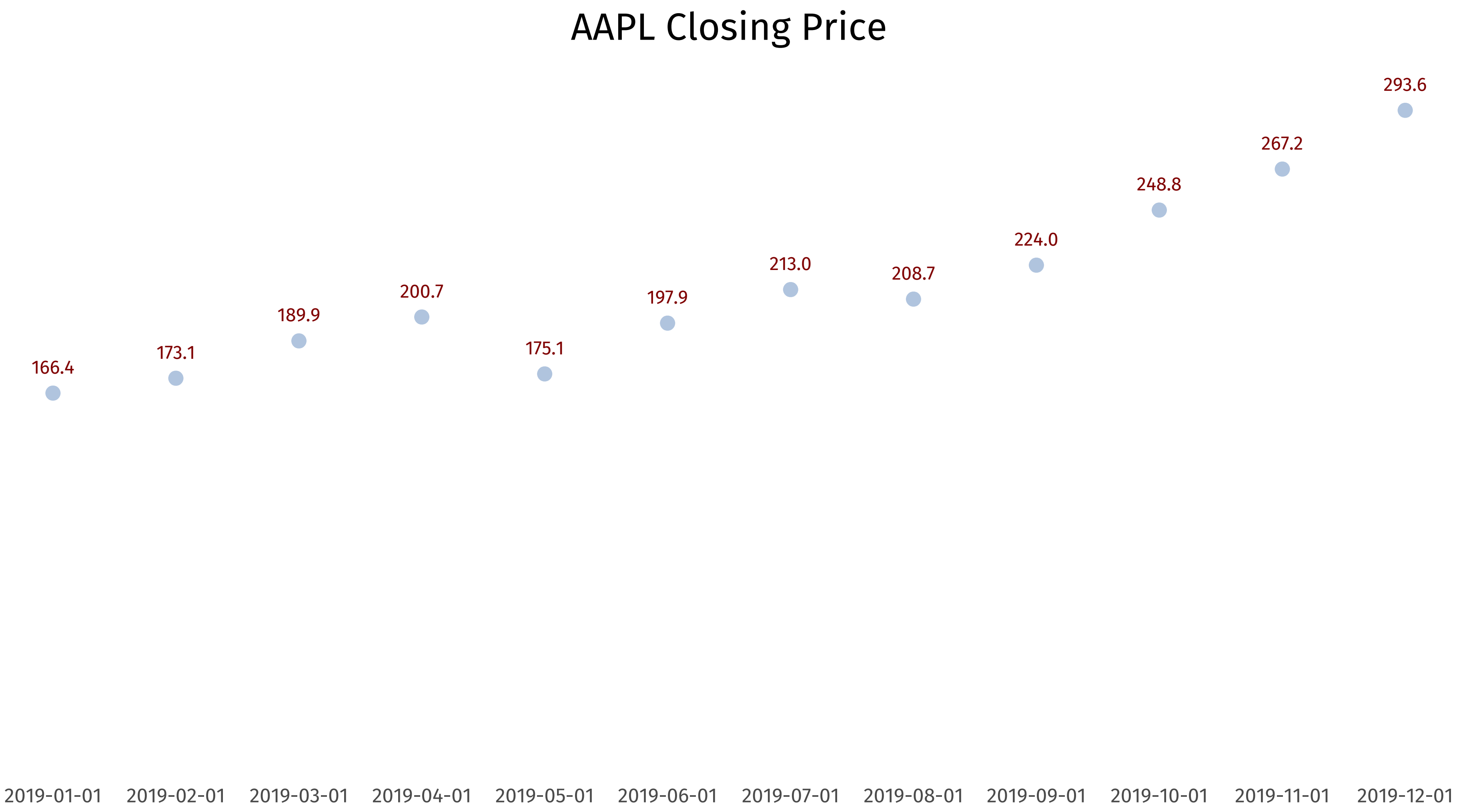
# Line Chart

```
dchart -bar=f -line AAPL.d
```



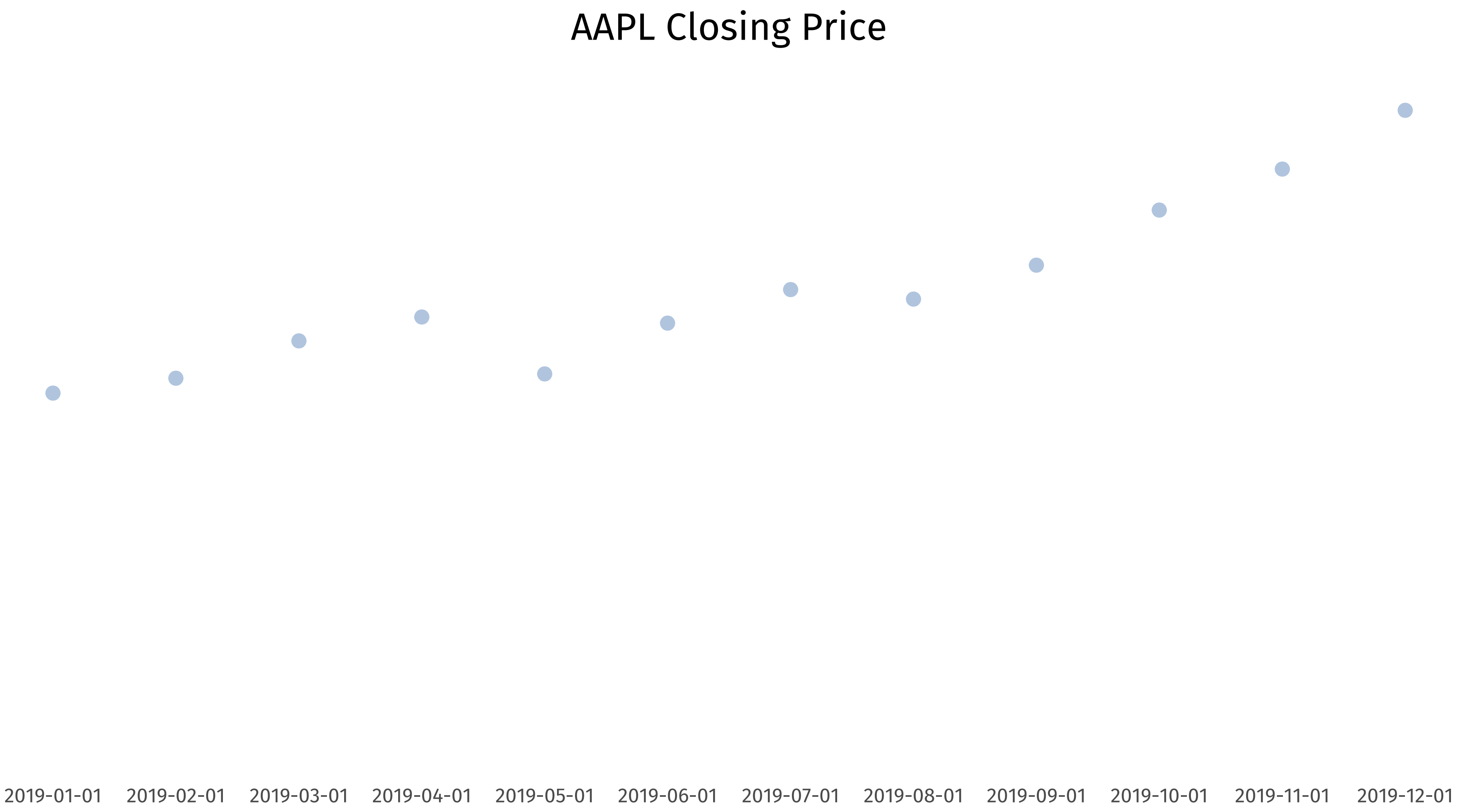
# Line Chart, Line Width

```
dchart -bar=f -line -linewidth=0.5 AAPL.d
```



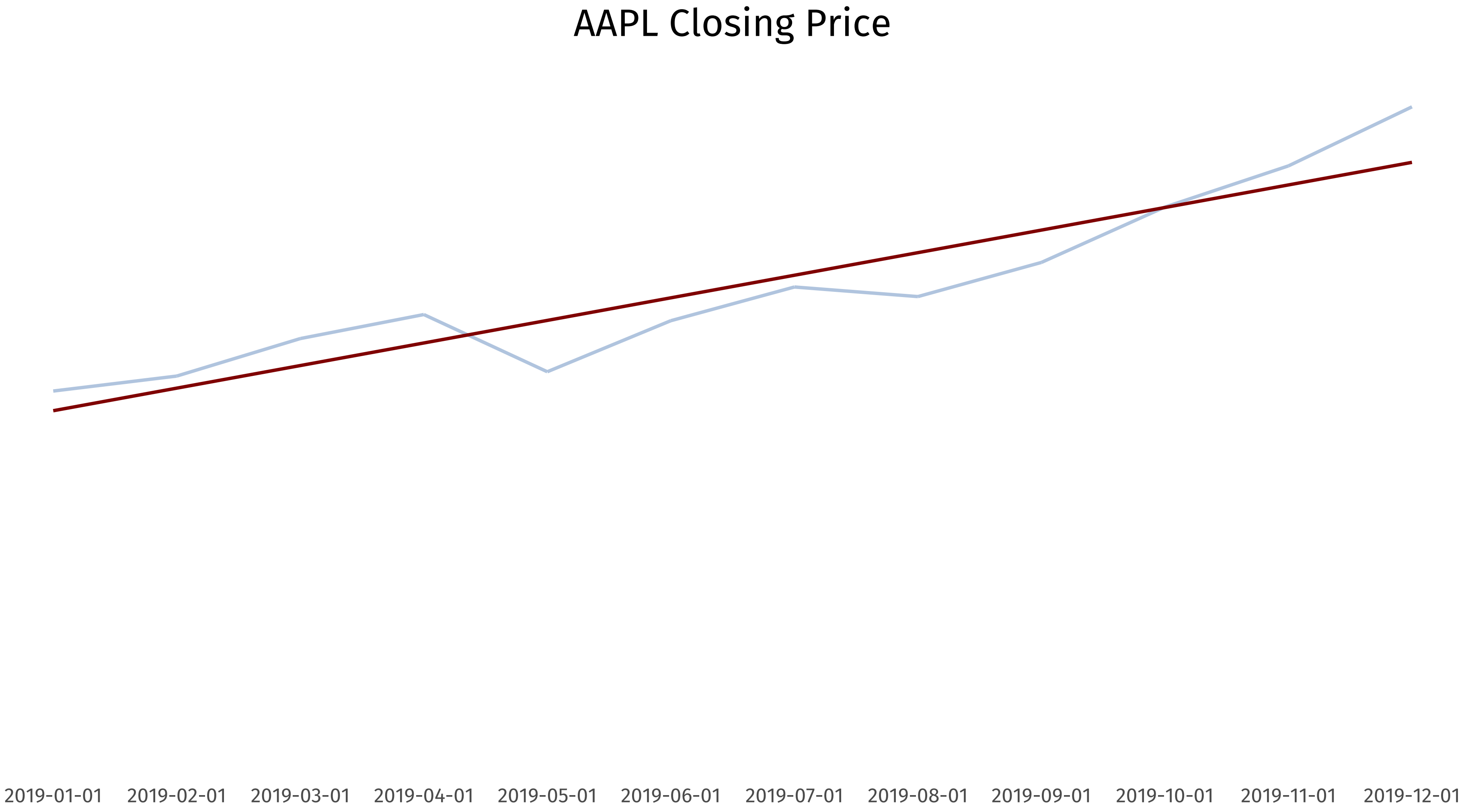
# Scatter Chart

```
dchart -bar=f -scatter AAPL.d
```



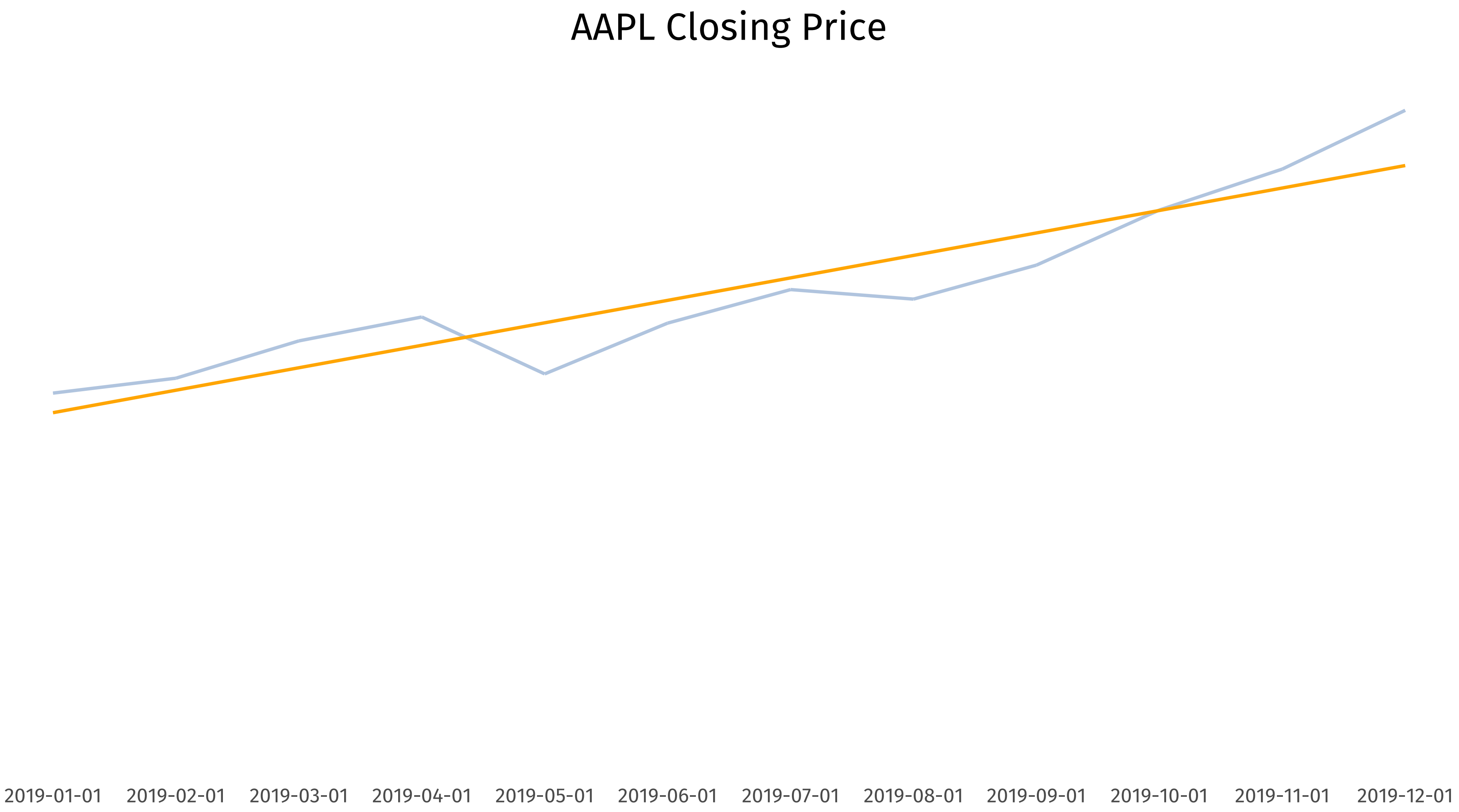
# Scatter Chart, No Values

```
dchart -bar=f -scatter -val=f AAPL.d
```



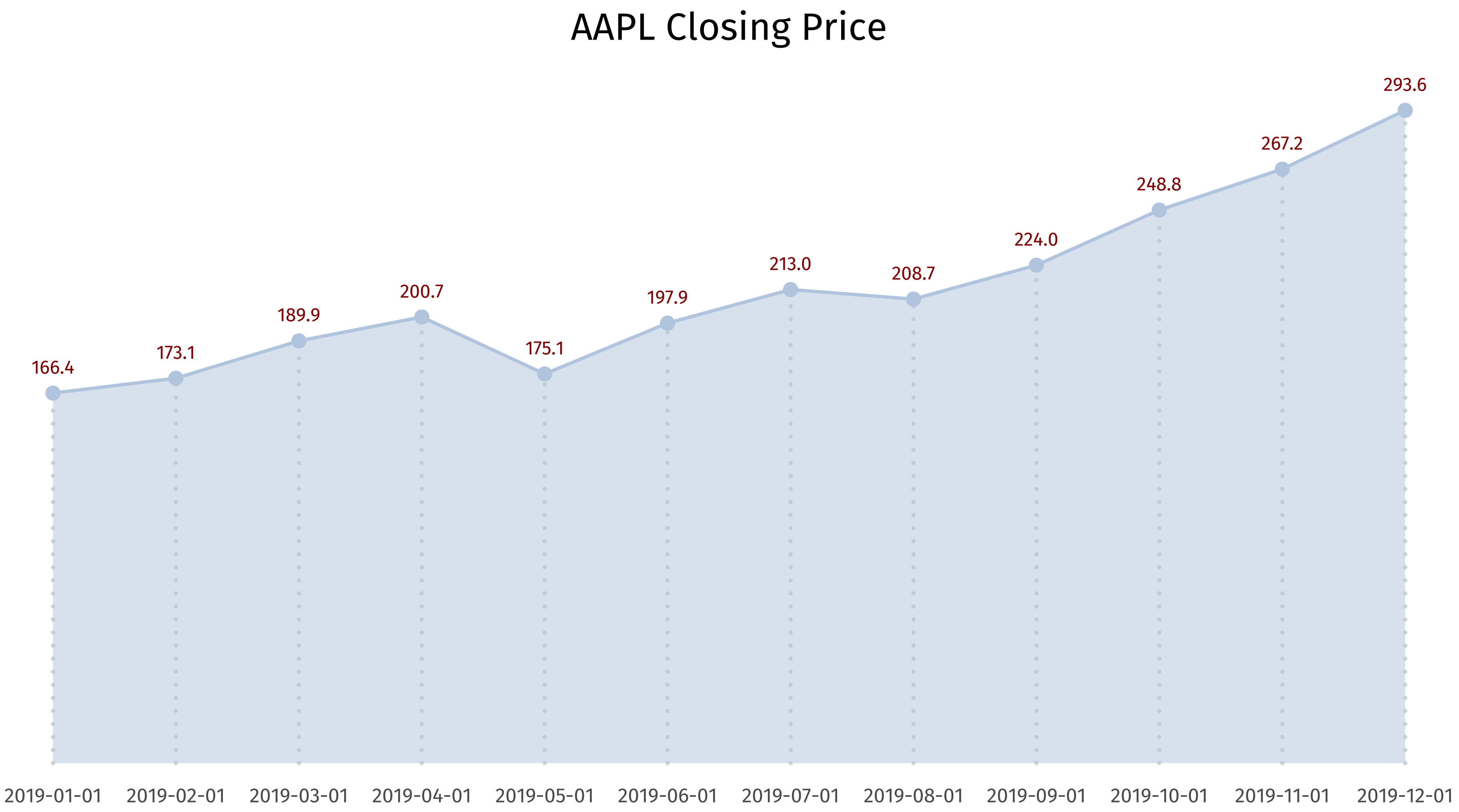
# Line Chart, No Values, Regression Line

```
dchart -bar=f -line -val=f -rline AAPL.d
```



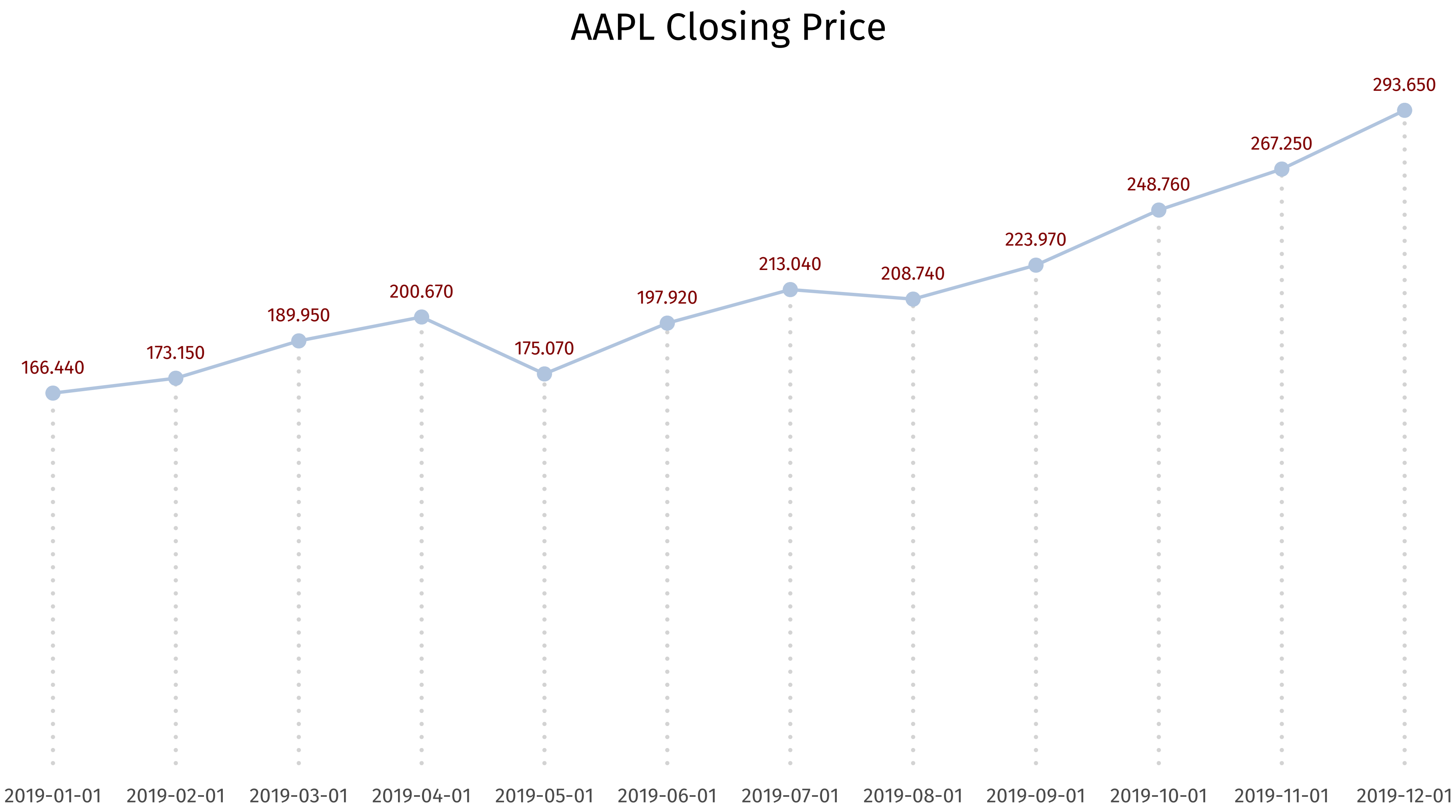
# Line Chart, No Values, Regression Line Color

```
dchart -bar=f -line -val=f -rline -rlcolor=orange AAPL.d
```



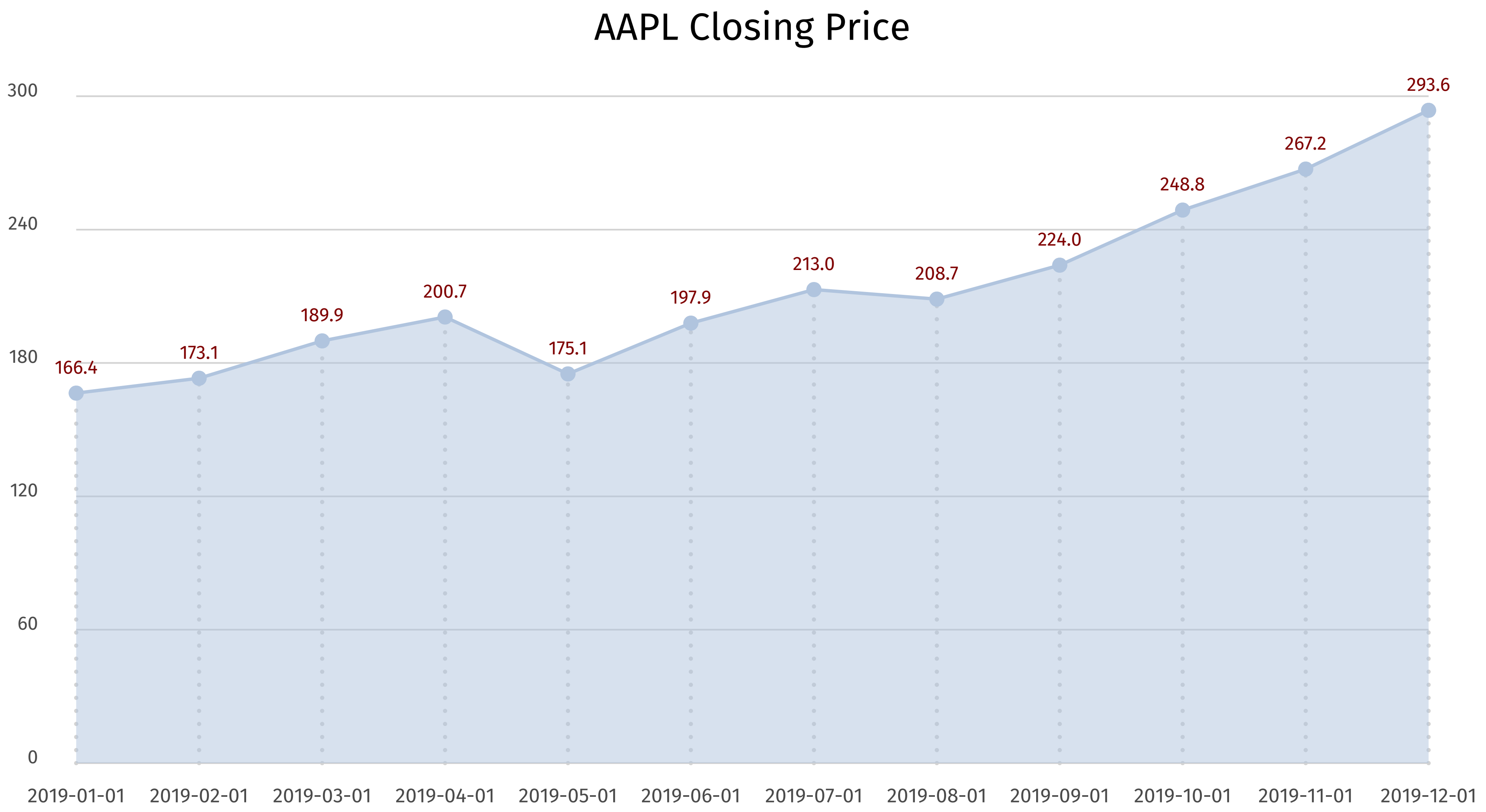
# Volume, Line, Dot

```
dchart -bar=f -line -vol -dot AAPL.d
```



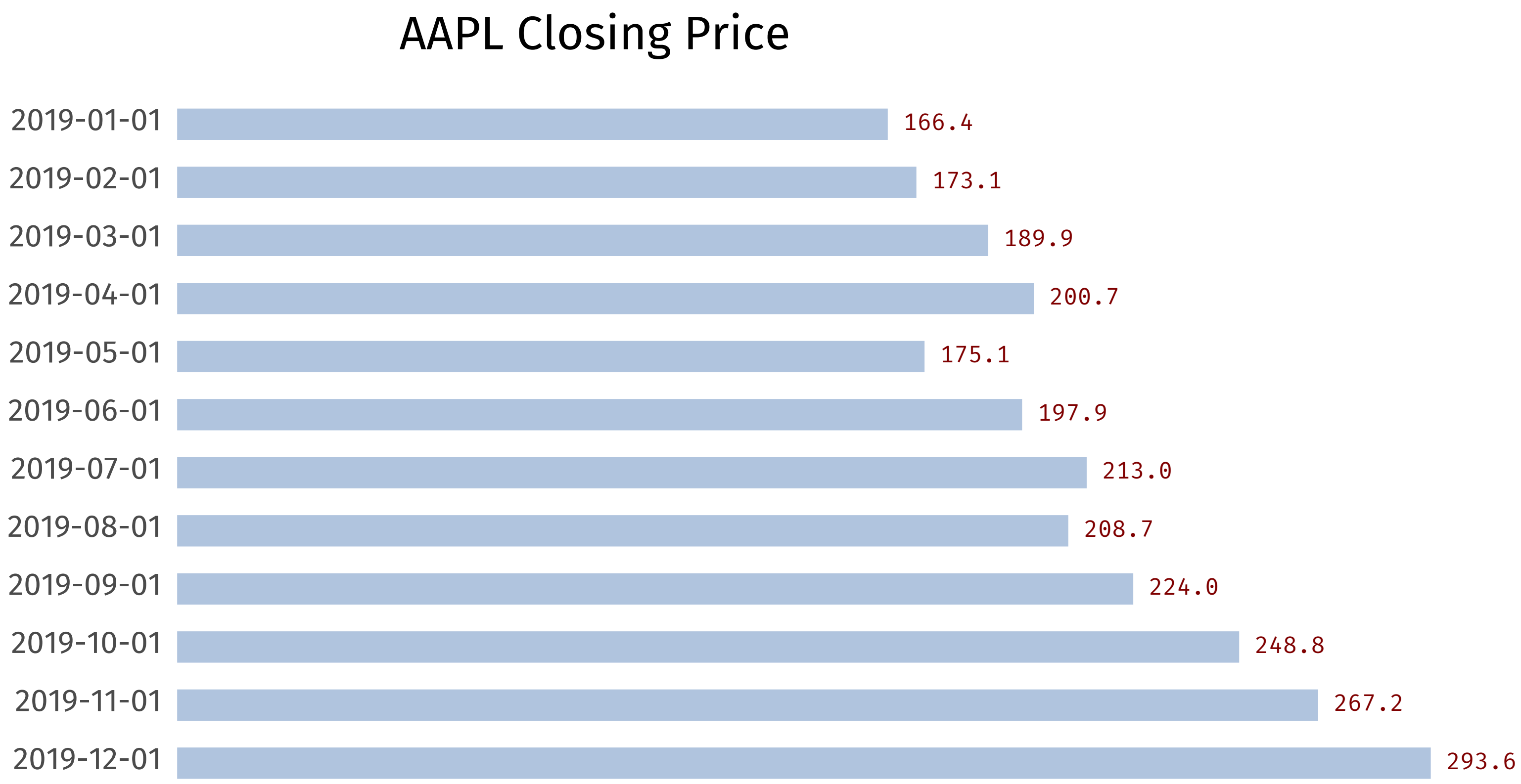
# Dot, Line, Data Format

```
dchart -datafmt %0.3f -bar=f -dot -line AAPL.d
```



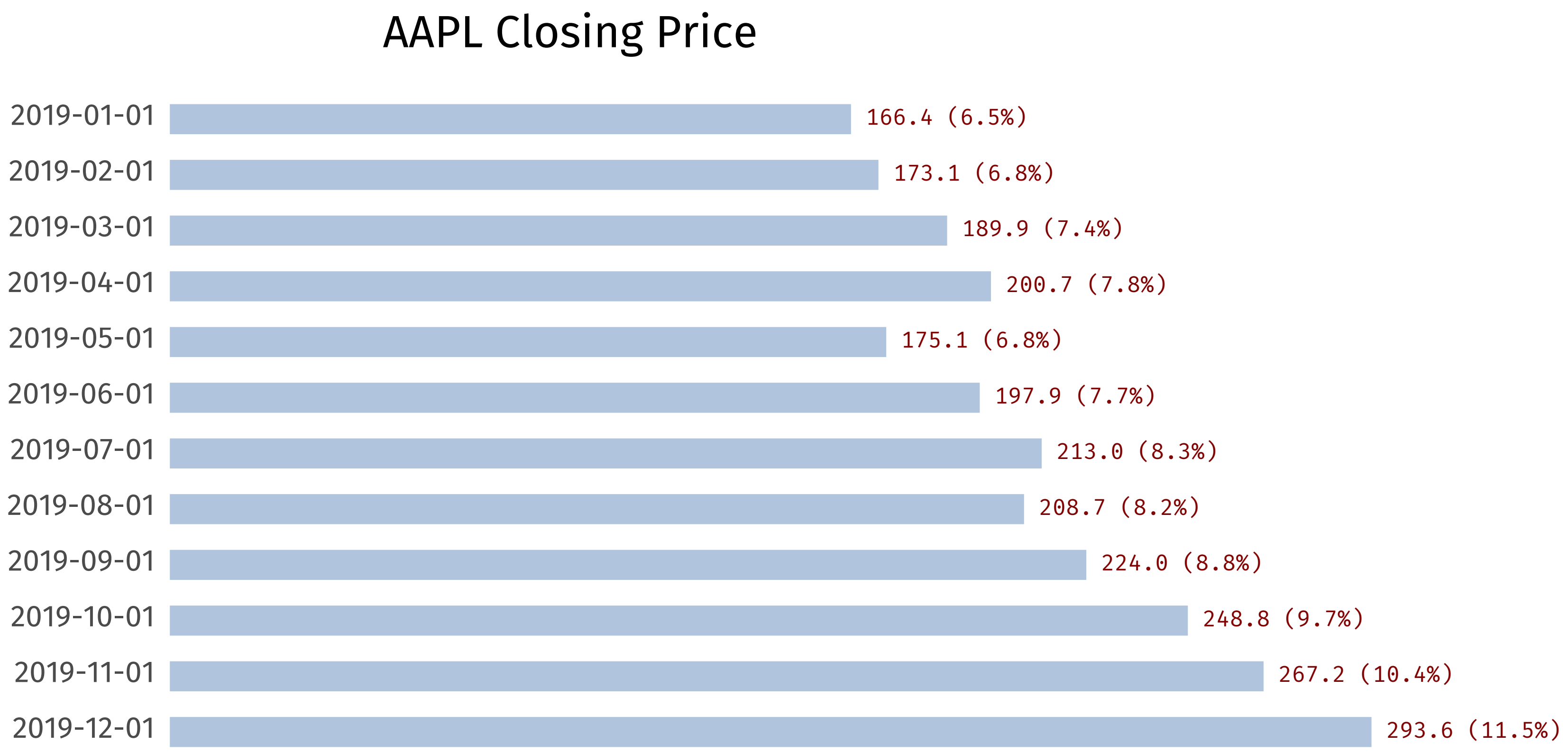
# Line, Area, Dot, Y-Axis, Grid

```
dchart -bar=f -line -vol -dot -grid -yaxis AAPL.d
```



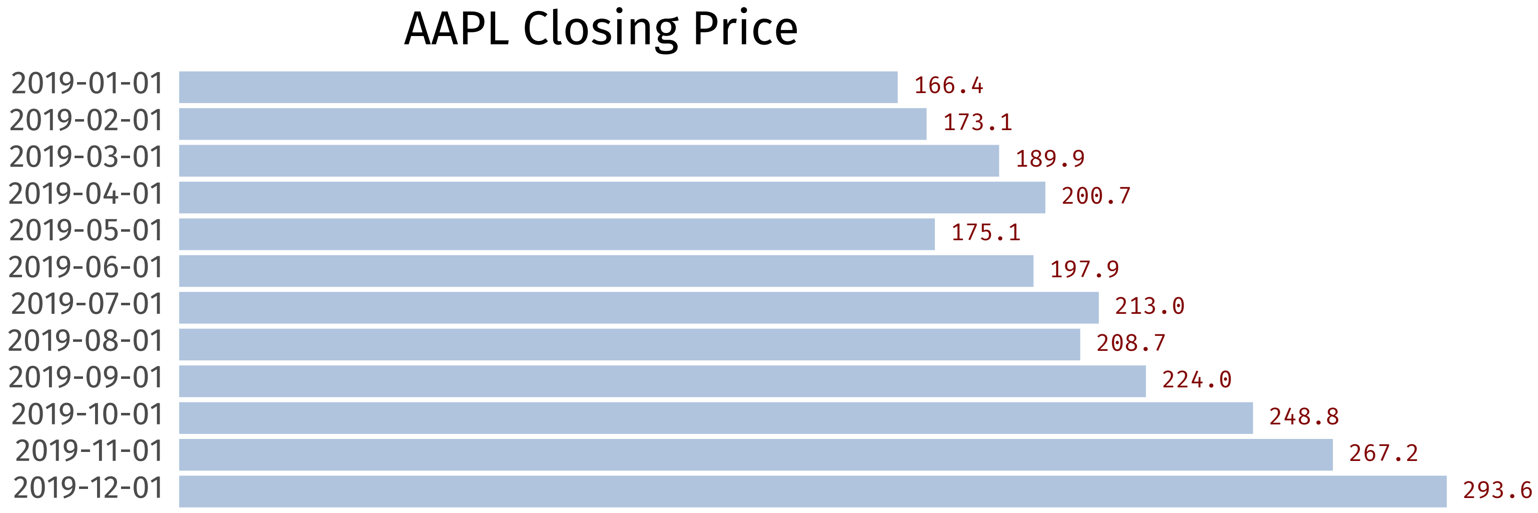
# Horizontal Bar

```
dchart -hbar AAPL.d
```



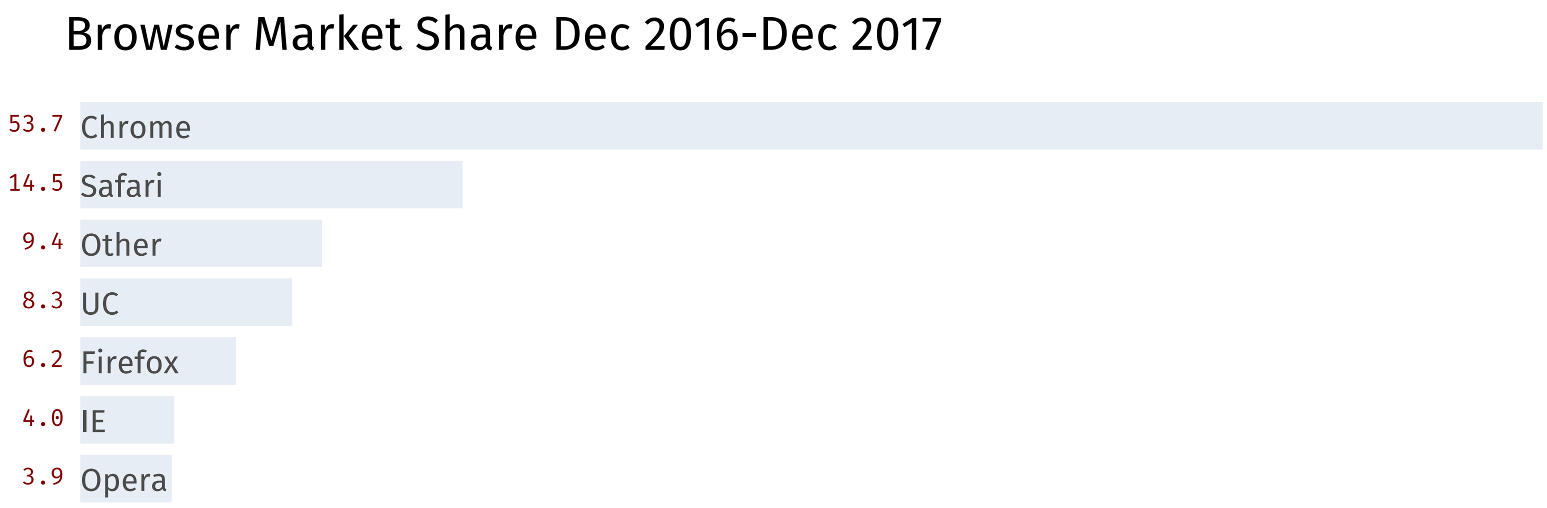
# Horizontal Bar, Show Percentages

```
dchart -hbar -pct AAPL.d
```



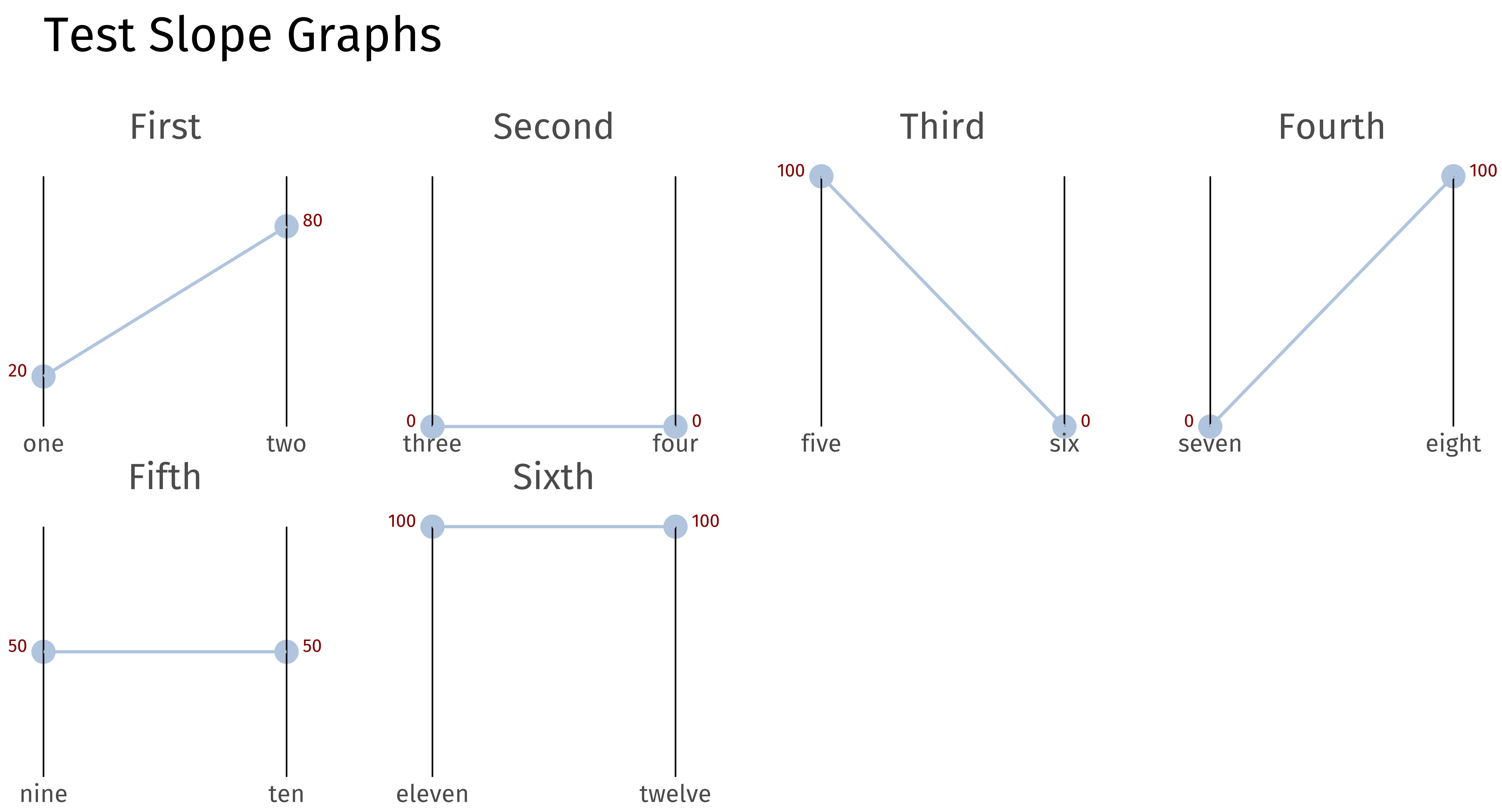
# Horizontal Bar, Line Spacing

```
dchart -hbar -ls 1.5 AAPL.d
```



# Word Bar

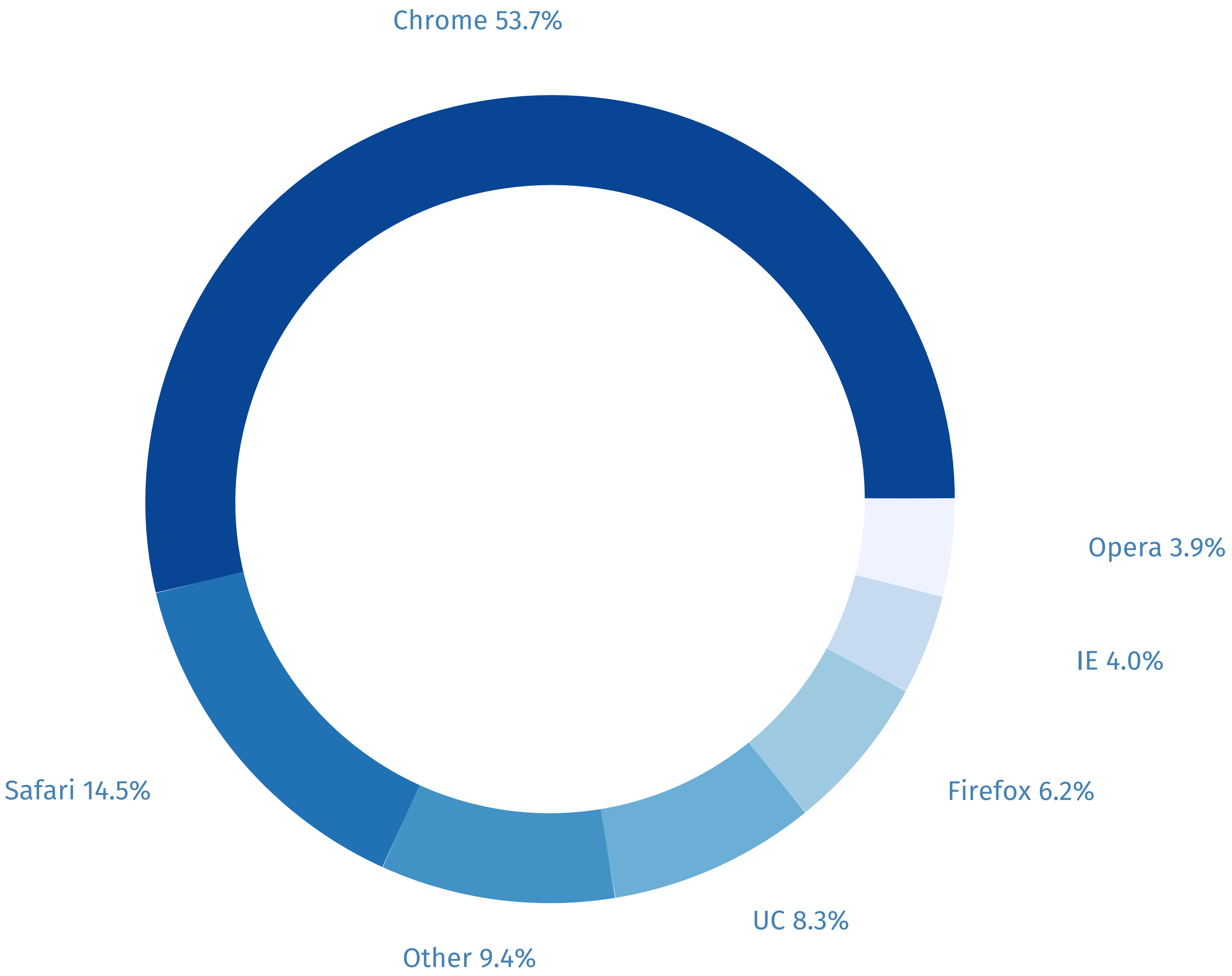
```
dchart -wbar AAPL.d
```



Test Slope Graphs

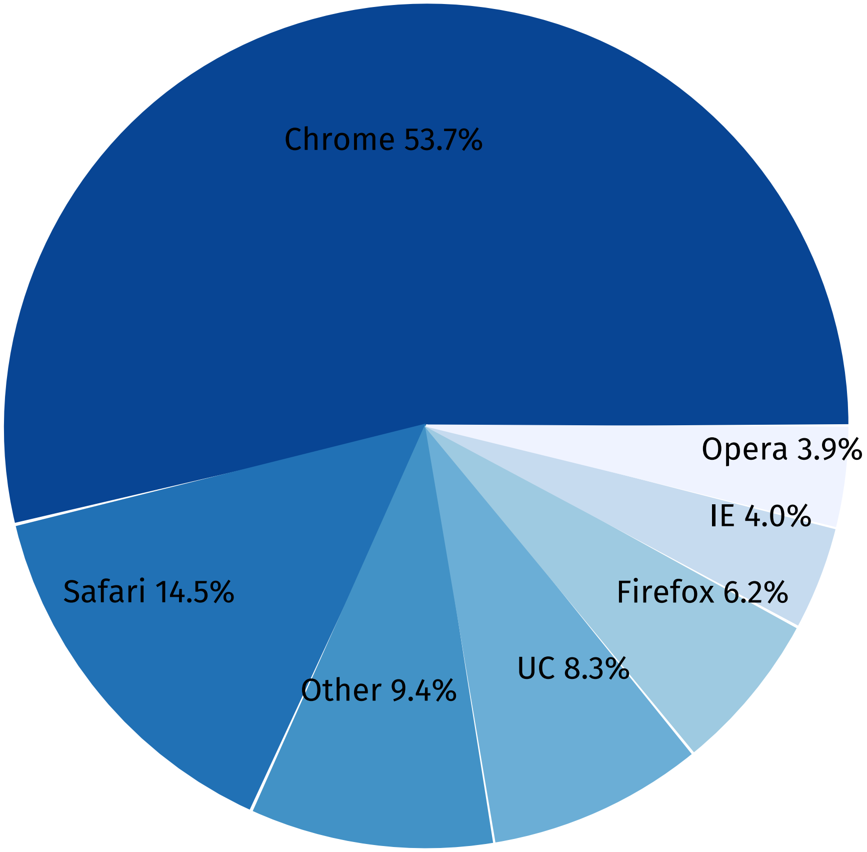
# Slope Chart

```
dchart -left=10 -right=25 -top=80 -bottom=60 -slope slope.d
```



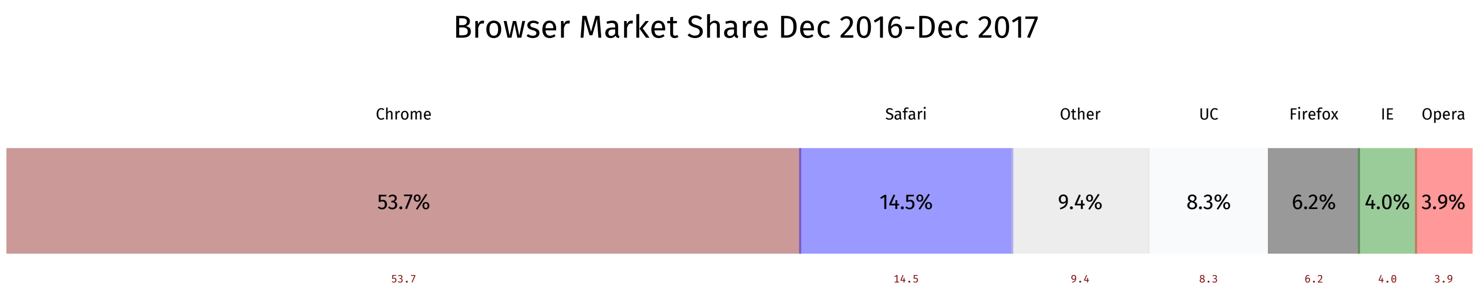
# Donut

```
dchart -donut -color=std -pwidth=5 browser.d
```



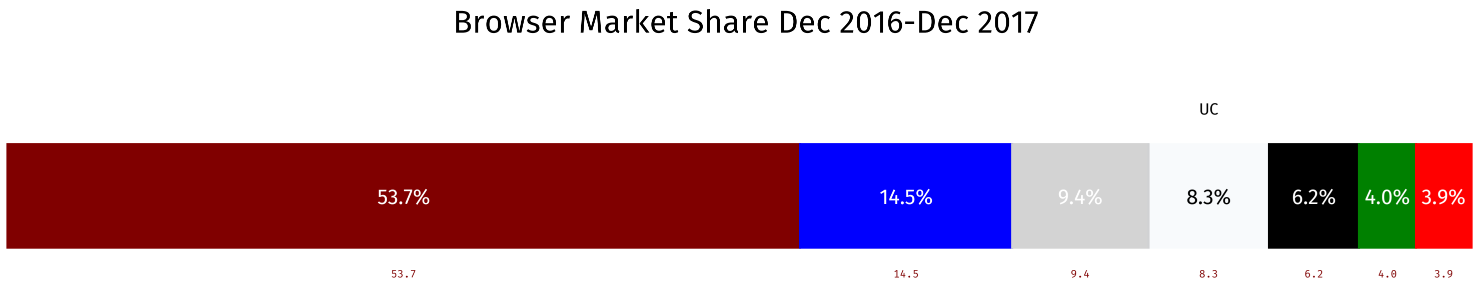
# Pie

```
dchart -donut -color=std -title=f -top=70 -pwidth=20 -psize=20 browser.d
```



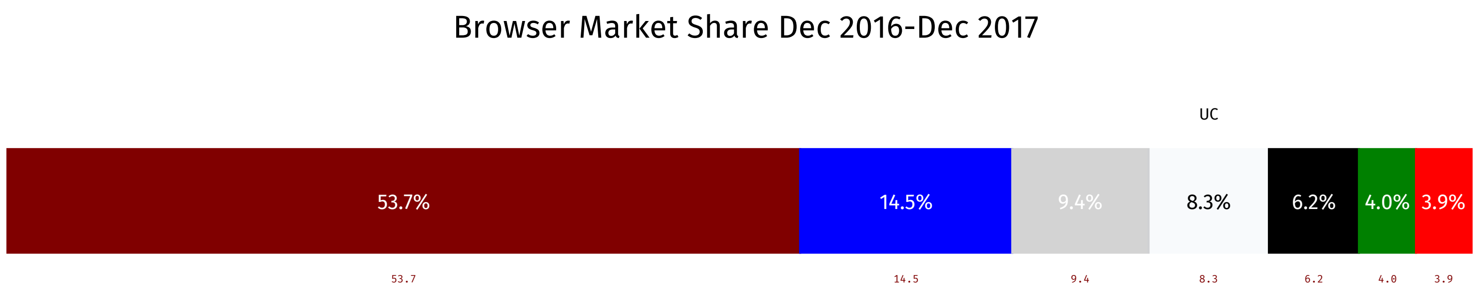
# Pmap

```
dchart -pmap -pwidth=5 -textsize=1 browser.d
```



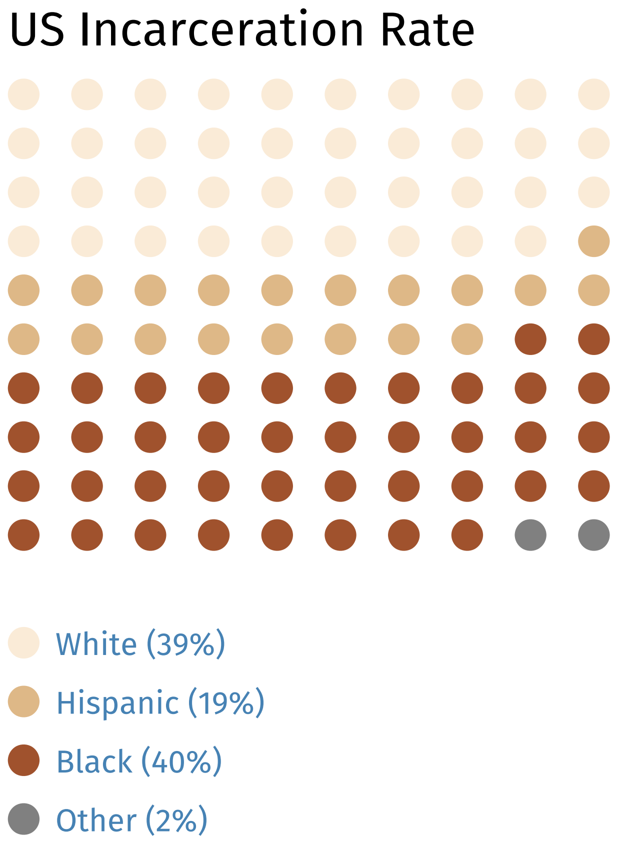
# Pmap with Solid Colors

```
dchart -pmap -pwidth=5 -textsize=1 -solidpmap browser.d
```



# Pmap with Solid Colors, Length Threshold

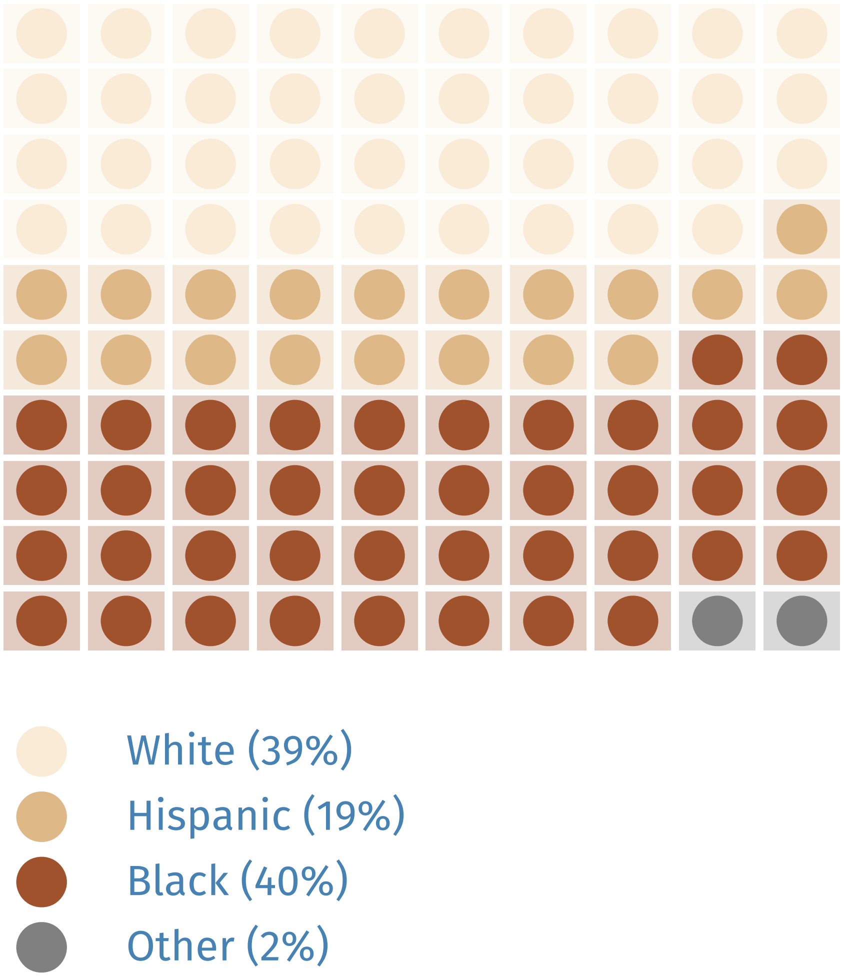
```
dchart -pmap -pwidth=5 -textsize=1 -solidpmap -pmlen=30 browser.d
```



# Pgrid

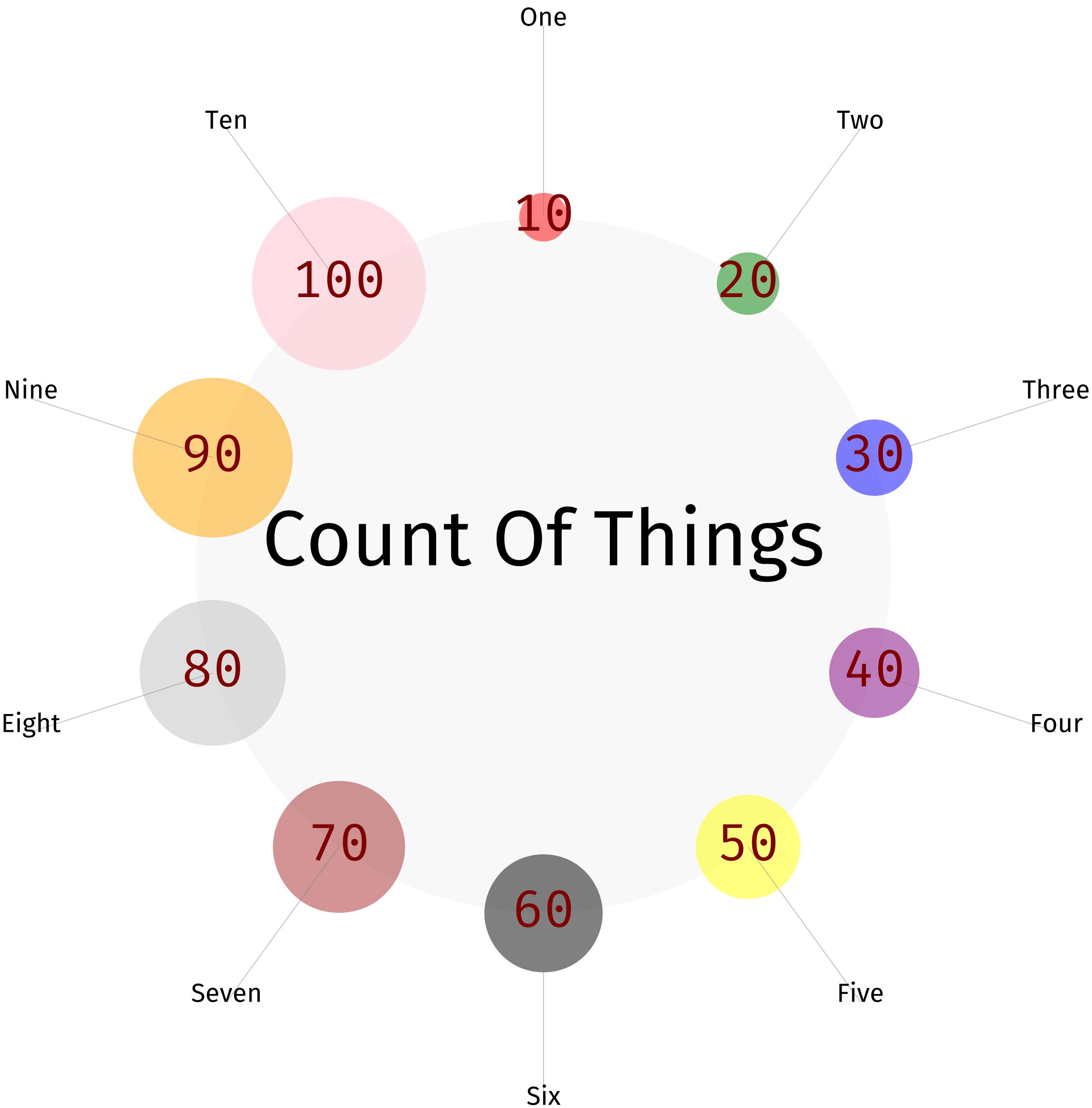
```
dchart -left 35 -top 80 -ls 3 -pgrid -val=f incar.d
```

# US Incarceration Rate



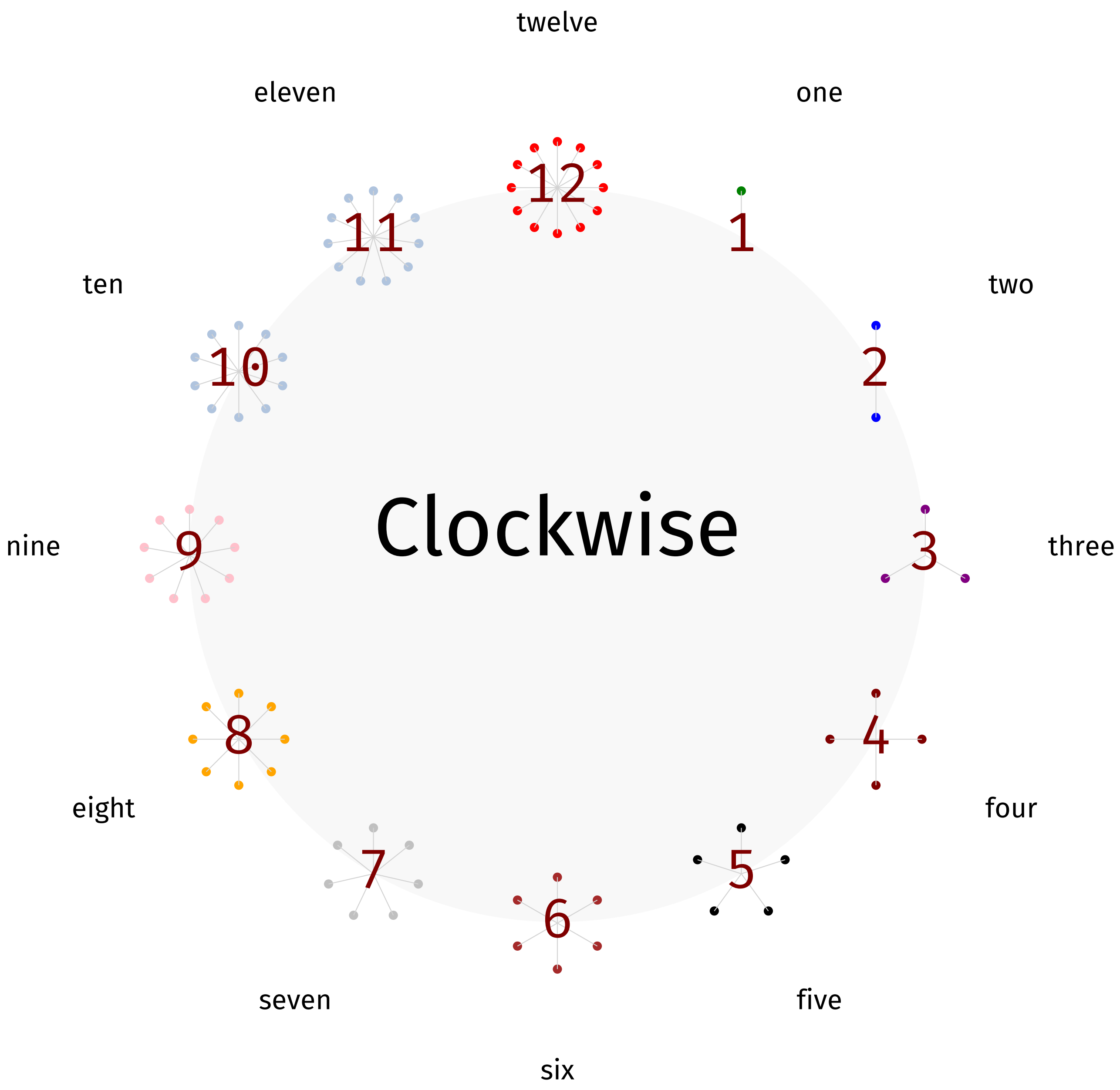
## Lego

```
dchart -left 30 -top 80 -textsize 4 -lego  incar.d
```



# Radial

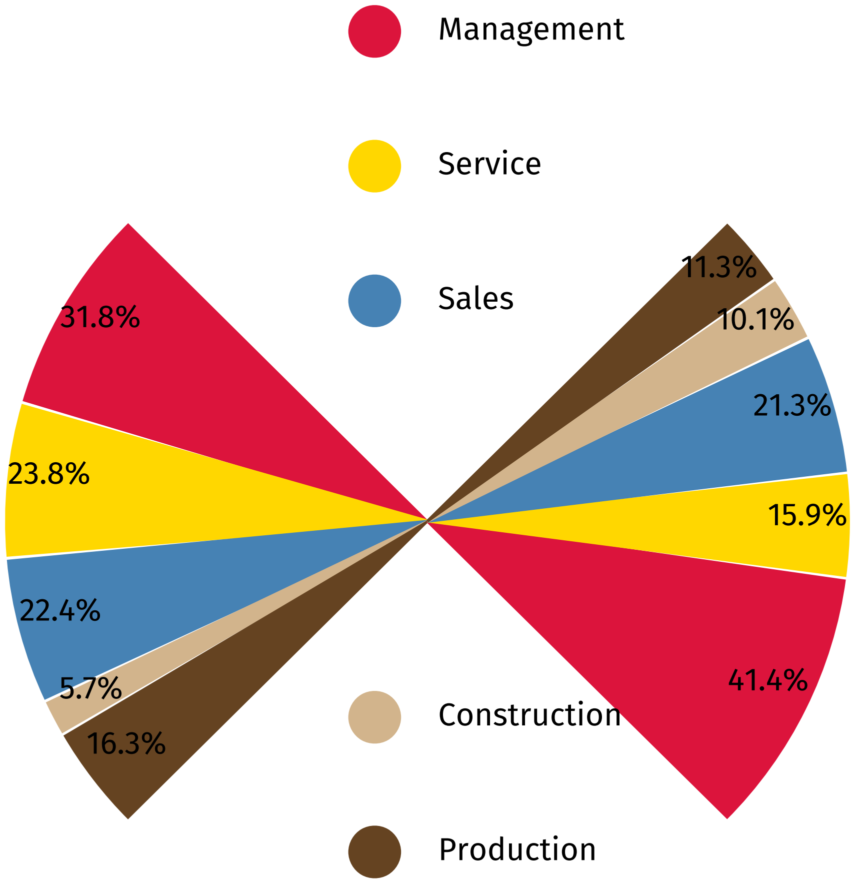
```
dchart -radial -psize=10 -pwidth=20 -top=55 -textsize=3 count.d
```



# Radial with Spokes

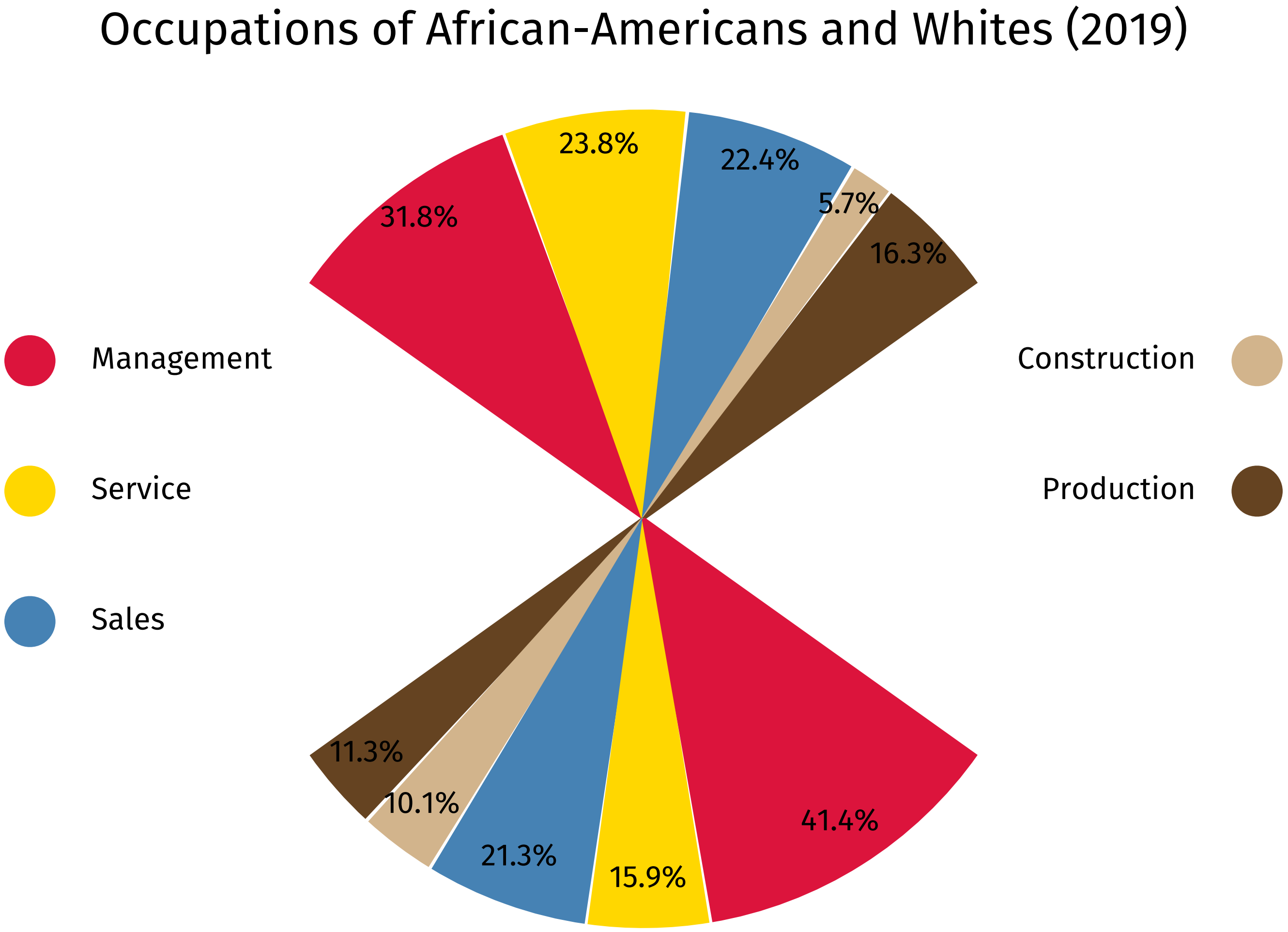
```
dchart -radial -psize=5 -pwidth=20 -top=55 -textsize=3 -spokes clock.d
```

Occupations of African-Americans and Whites (2019)



# Bowtie chart

```
dchart -val=t -psize=20 -top=60 -bowtie  occupation.d
```



Occupations of African-Americans and Whites (2019)

# Fan chart

```
dchart -val=t -psize=20 -top=60 -fan occupation.d
```