Les diagrammes en secteurs
(camemberts)

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En France : camembert

Au Danemark : lagkagediagram

En Allemagne : Tortendiagramm

En anglais : pie chart

Aux Pays-bas : taartdiagram

En Argentine : diagrama de torta

Au Québec : pizza

Au Brésil : gráfico de pizza

En Roumanie : diagramă plăcintă

International Statistical Institute

http://isi.cbs.nl/glossary/term550.htm

Language	Description
English	circular chart ; circular diagram ; pie diagram ; pie chart ; sector chart
French	diagramme circulaire ; graphique à secteurs ; diagramme à secteurs
German	Kreisdiagramm
Dutch	cirkeldiagram ; taartdiagram
Italian	grafico circolare ; grafico a settori
Spanish	gráfico circular ; gráfico de sectores ; diagrama de sectores
Catalan	diagrama de pastís ; gràfic de sectors ; diagrama circular
Portuguese	diagrama circular ; diagrama de queijo ; gráfico de sectores ; gráfico de pizza (bra) ; diagrama de pizza (bra)
Romanian	diagramă circulară ; diagramă "placintă" ; cerc de structură ; diagramă de structură
Danish	lagkagediagram
Finnish	sektoridiagrammi ; piirakkakuvio ; ympyräkuvio
Hungarian	kördiagram
Estonian	sektordiagramm ; ringdiagramm
Slovenian	prikaz s krogi ; strukturni krog
...	...

Dénominations françaises

- graphique à secteur
- graphique sectoriel
- graphique en secteurs circulaires
- diagramme circulaire
- diagramme à secteurs
- diagramme en secteurs
- diagramme en secteurs circulaires
- camembert (familier)
- diagramme en cercle (dans l'index de Bertin 1973)
- construction circulaire (dans le texte de Bertin 1973)
- construction inefficace et inutile (Bertin 1968)

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Source

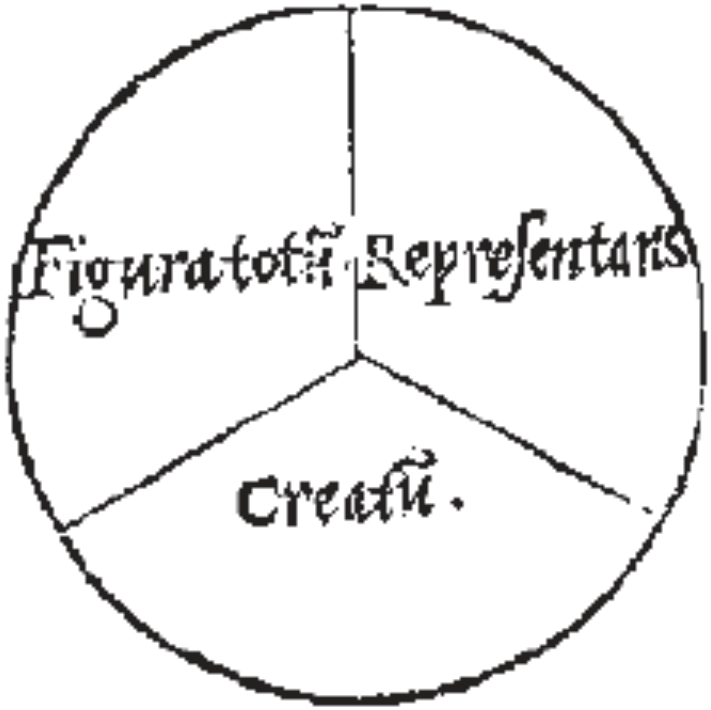
Journal of Educational and Behavioral Statistics
Winter 2005, Vol. 30, No. 4, pp. 353–368

No Humble Pie: The Origins and Usage of a Statistical Chart

Ian Spence
University of Toronto

William Playfair's pie chart is more than 200 years old and yet its intellectual origins remain obscure. The inspiration likely derived from the logic diagrams of Llull, Bruno, Leibniz, and Euler, which were familiar to William because of the instruction of his mathematician brother John. The pie chart is broadly popular but—despite its common appeal—most experts have not been seduced, and the academy has advised avoidance; nonetheless, the masses have chosen to ignore this advice. This commentary discusses the origins of the pie chart and the appropriate uses of the form.

Ramon Llull (1235-1315)



Ars Magna (1305-08)

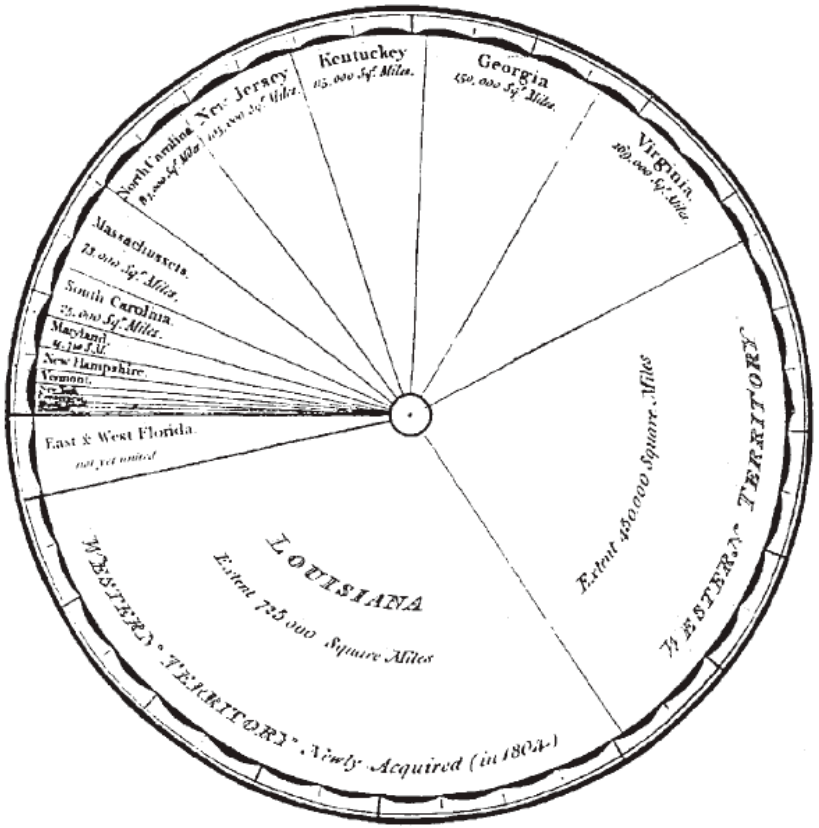
Giordano Bruno (1548-1600)

William Playfair (1759-1823)

(Portrait contemporain) Mécanicien, ingénieur, dessinateur, comptable, inventeur, orfèvre, marchand, courtier, économiste, statisticien, polémiste, publicitaire, spéculateur, contrevenant, banquier, ultra, éditeur, corbeau et journaliste. Il participa à la prise de la Bastille le 14 juillet 1789.

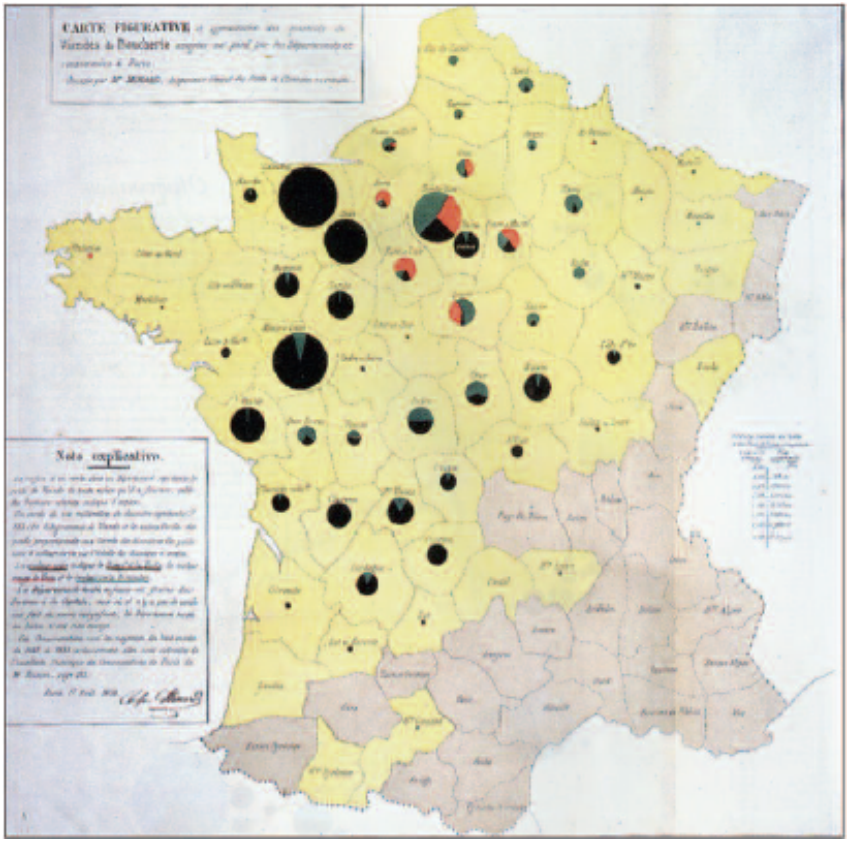
Biographie

Spence, I. & Wainer, H. (1997). Who was Playfair ? *Chance*, **10** :35-37.

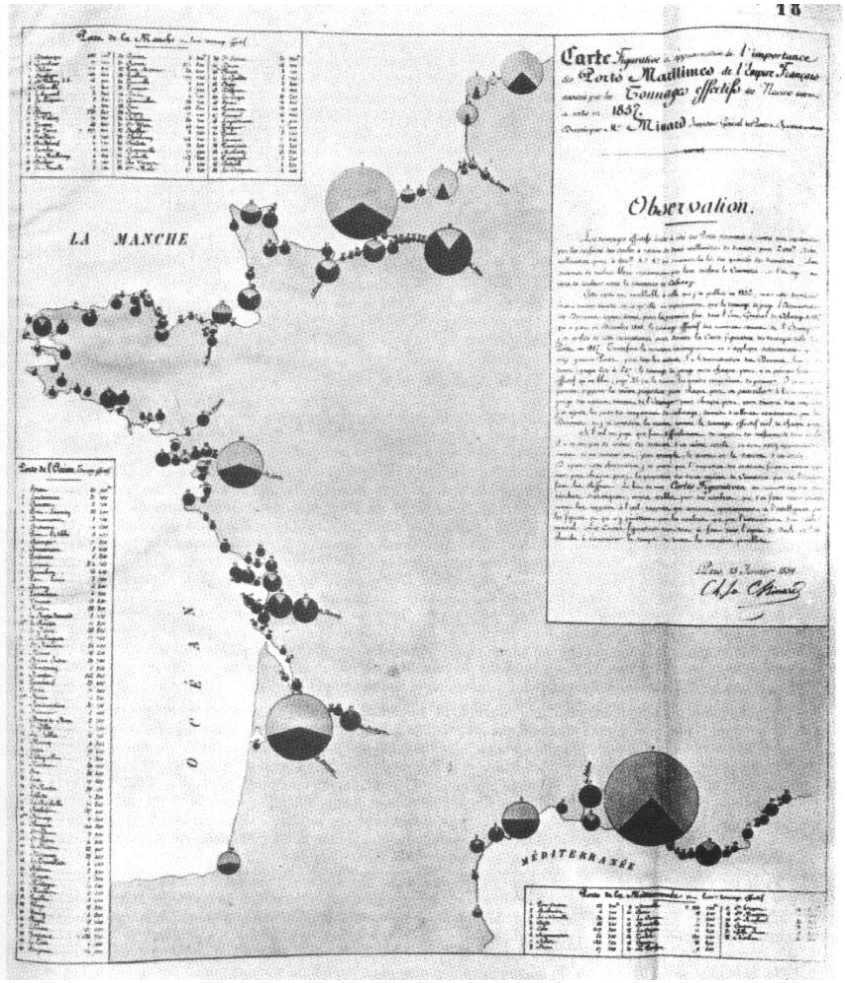


Playfair's 1805 Statistical Representation of the U.S.A.

Charles Joseph Minard (1781-1870)

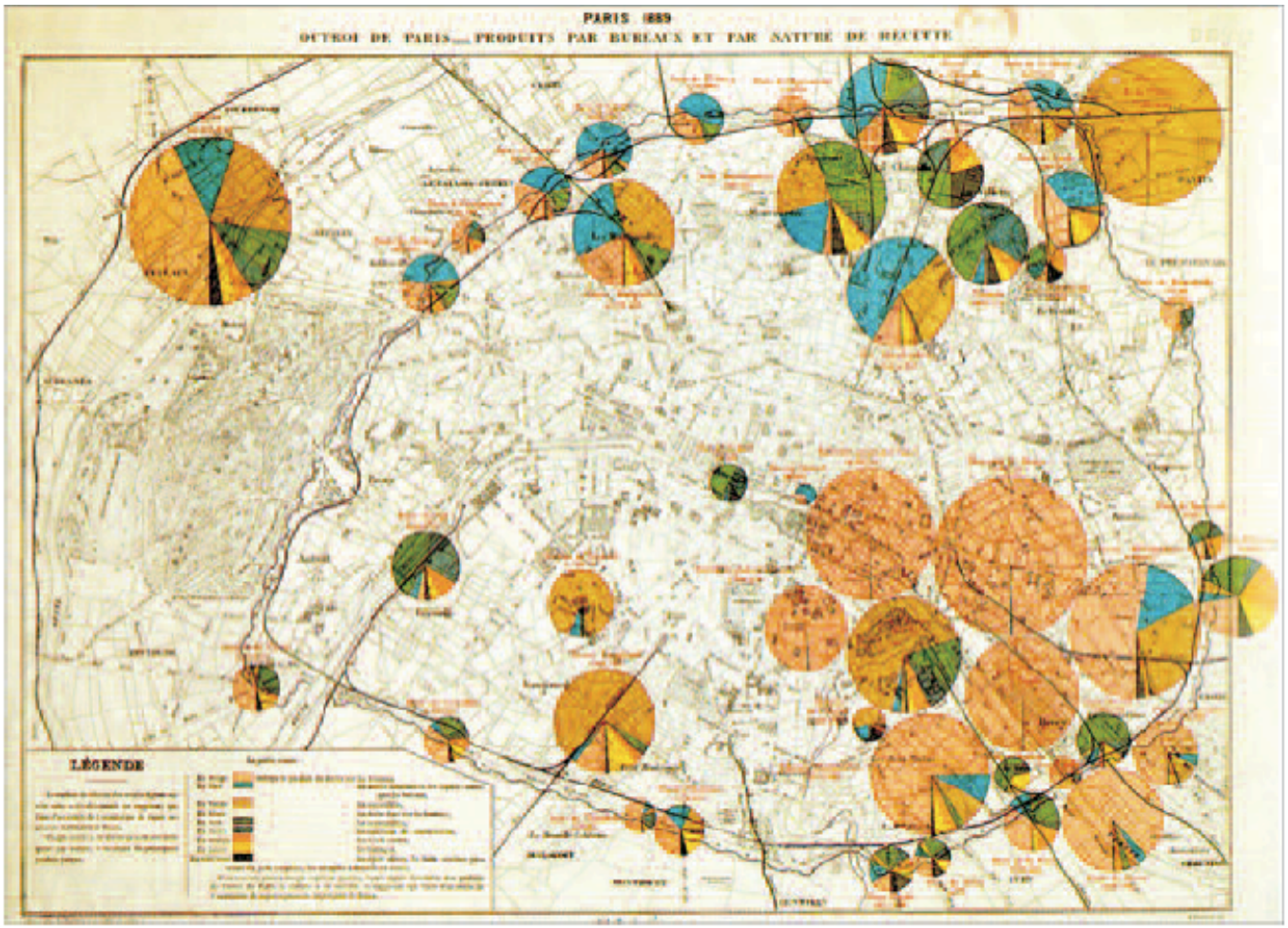


Carte figurative et approximative des quantités de viande de boucherie envoyées sur pied par les départments et consommées à Paris (1858)



Carte figurative et approximative de l'importance des ports maritimes français mesurée par les tonnages effectifs des navires entrés et sortis en 1857

Alphonse Bertillon (1823-1914)



Paris 1889 - Octroi de Paris - Produit par bureau et par nature de recette.

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Des critiques anciennes

The circle with sectors is not a desirable form of presentation
Brinton, W. C. (1914). *Graphic methods for presenting facts*. New York : The Engineering Magazine Company. Reprinted New York, NY : Arno Press, 1980.

études de psychologie expérimentale

- Eells (1926)
- Croxton (1927)
- Croxton & Stein (1932)
- Croxton & Stryker (1927)
- von Huhn (1927)

Des critiques récentes

Dans  2.6.1 (26-NOV-2007)

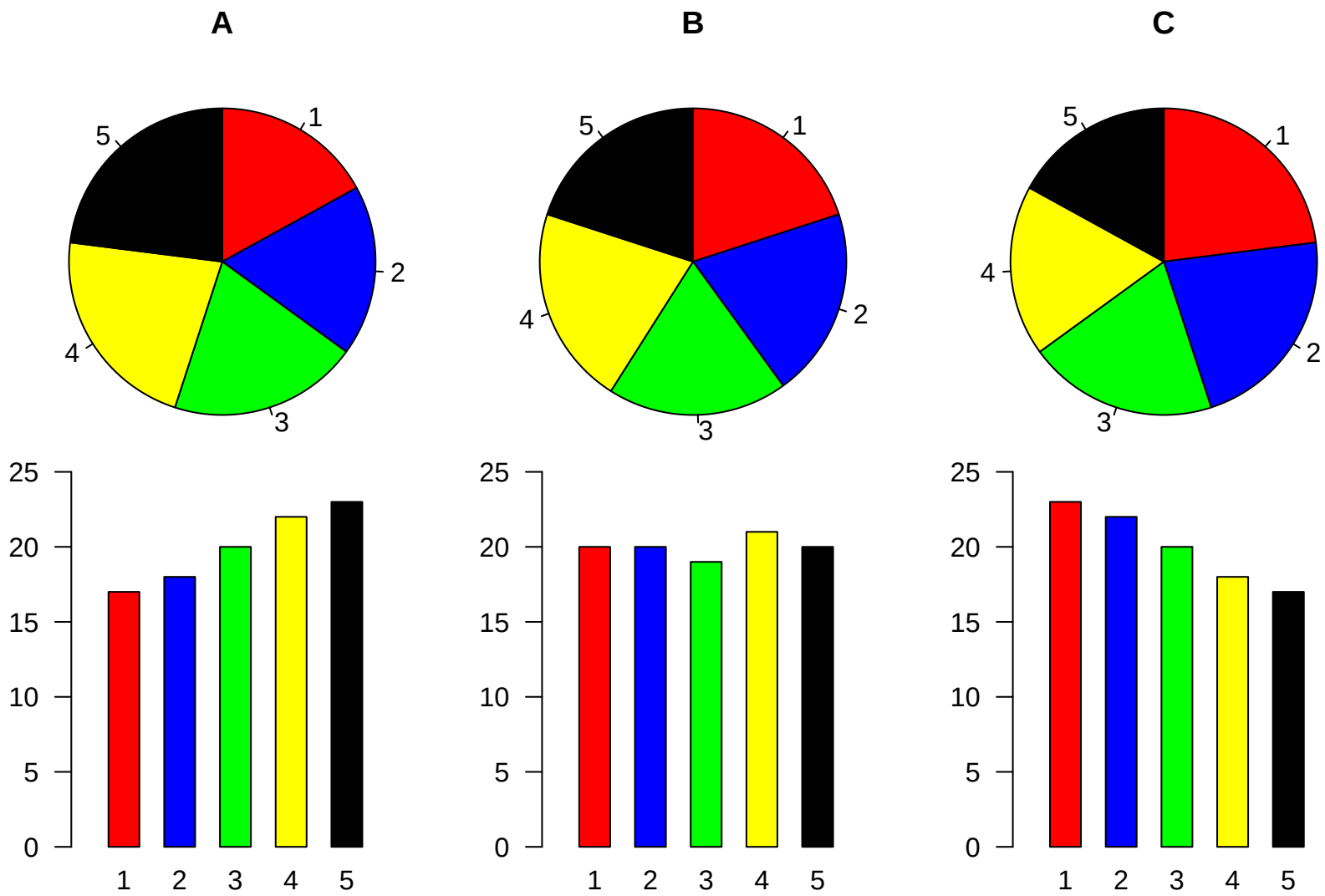
?pie

Pie charts are a very bad way of displaying information. The eye is good at judging linear measures and bad at judging relative areas. A bar chart or dot chart is a preferable way of displaying this type of data.
Cleveland (1985), page 264 : "Data that can be shown by pie charts always can be shown by a dot chart. This means that judgements of position along a common scale can be made instead of the less accurate angle judgements." This statement is based on the empirical investigations of Cleveland and McGill as well as investigations by perceptual psychologists.

Démo 1 (en.wikipedia.org/wiki/User :Schutz)

```
a <- matrix(c(17, 18, 20, 22, 23, 20, 20, 19, 21, 20,
    23, 22, 20, 18, 17), nrow = 3, byrow = T)
titles <- LETTERS[1:3]
cols <- c("red", "blue", "green", "yellow", "black")
defaultmar <- c(5, 4, 4, 2) + 0.1
layout(matrix(c(1, 3, 5, 2, 4, 6), nrow = 2, byrow = T),
    height = c(1, 1))
par(cex = 1, font = 1, las = 1, font.axis = 1, mgp = c(1,
    1, 0))
for (i in 1:nrow(a)) {
    par(mar = c(0, 0, 2, 0))
    pie(a[i, ], clockwise = T, col = cols, main = titles[i])
    par(mar = defaultmar + c(-2, -1.5, -4, -0.5))
    par(mgp = c(0, 0.5, 0))
    barplot(a[i, ], xlim = c(0, 10), ylim = c(0, 25),
        col = cols, border = "black", names.arg = 1:5,
        space = 0.8, axes = F)
    par(mgp = c(0, 1, 0))
    axis(2)
}
```

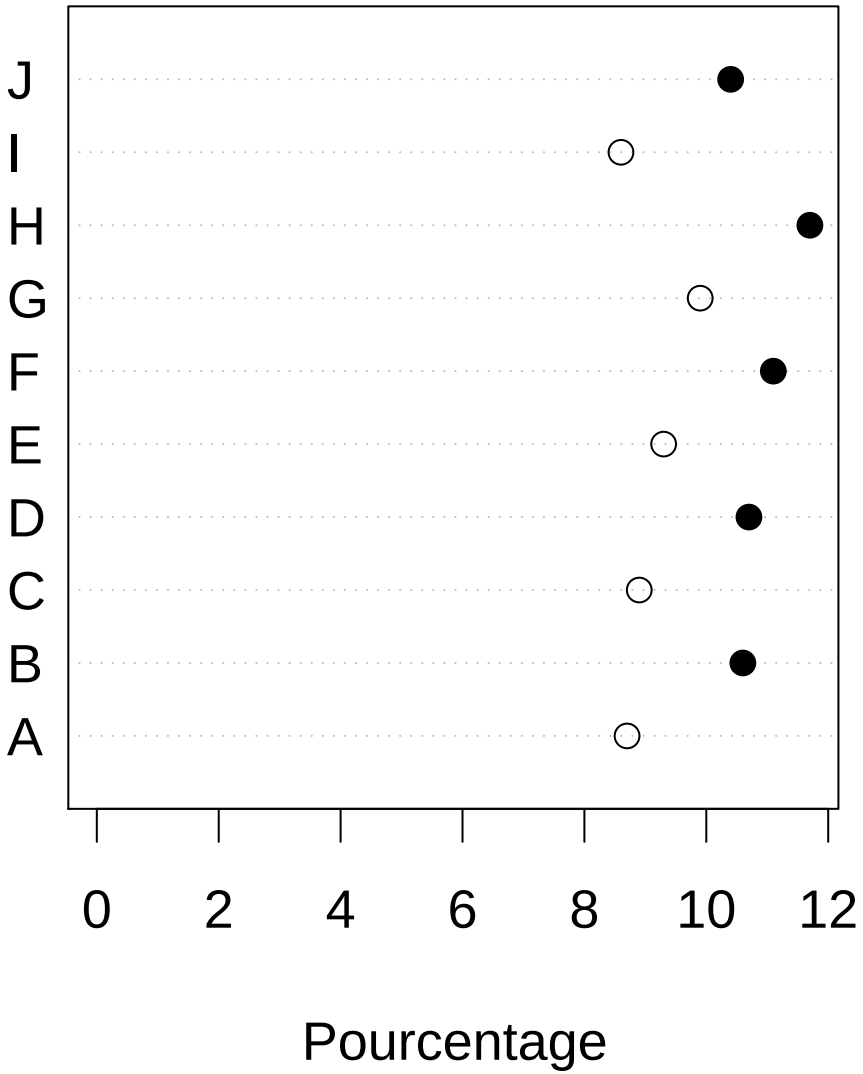
Démo 1 (en.wikipedia.org/wiki/User :Schutz)

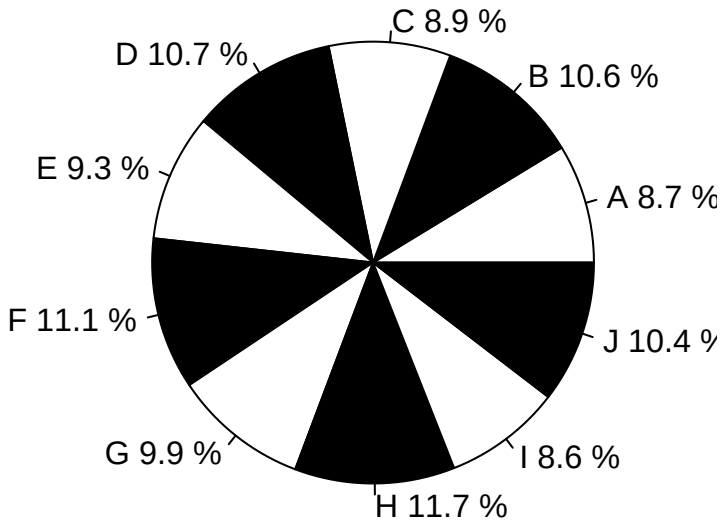


Démo 2 (Edward Tufte)

```
set.seed(1)
simu <- rep(10, 10) + rep(2 * runif(5), rep(2, 5)) +
    rep(c(-1, 1), 5)
simu <- round(100 * simu/sum(simu), 1)
names(simu) <- LETTERS[1:10]
par(mfrow = c(1, 2), mar = c(5, 4, 0, 0) + 0.1)
dotchart(x = simu, xlim = c(0, max(simu)), pch = c(1,
    19), cex = 1.7, cex.lab = 1, cex.axis = 0.5, xlab = "Pourcentage")
pie(x = simu, labels = paste(names(simu), simu, "%"),
    col = c("white", "black"), radius = 0.7)
```

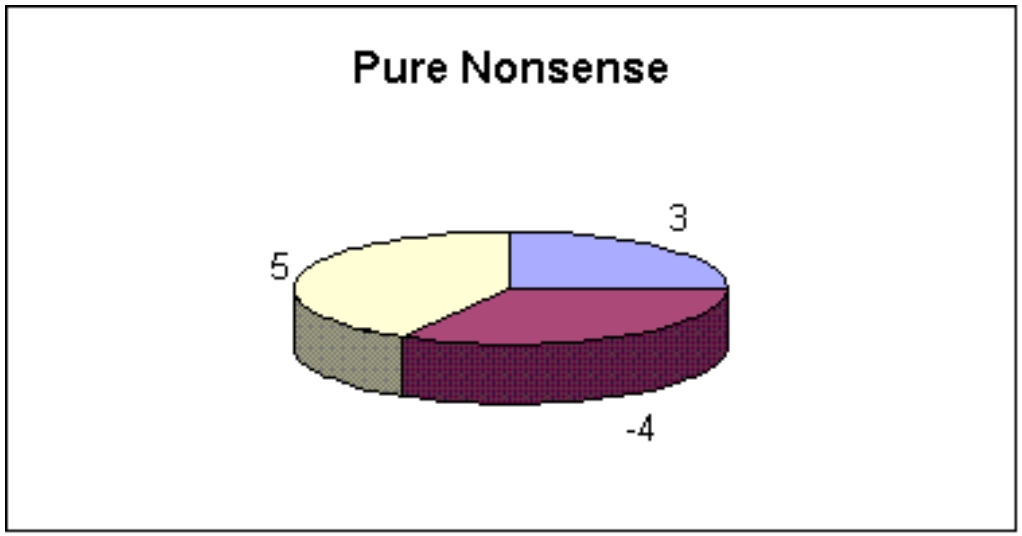
Démo 2 (Edward Tufte)





Démo 3 (Patrick Burns)

http://www.burns-stat.com/pages/Tutor/spreadsheet_addiction.html

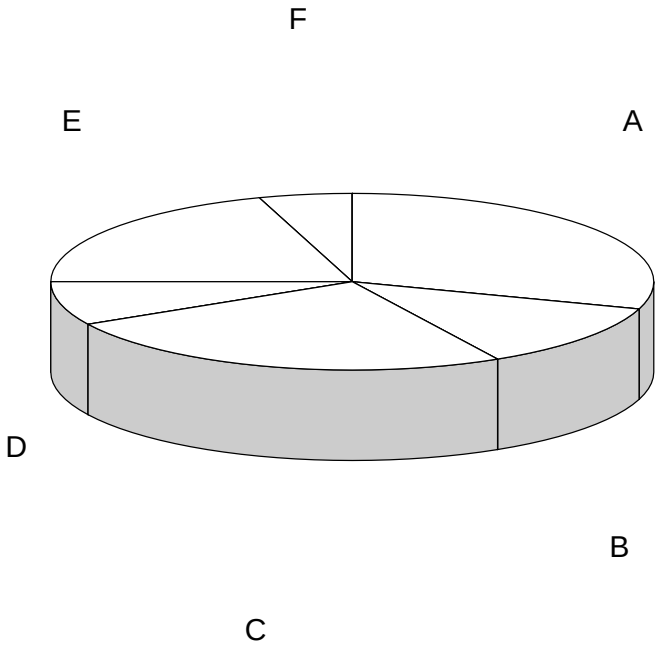



```
library(fortunes)
fortune("pie chart")
```

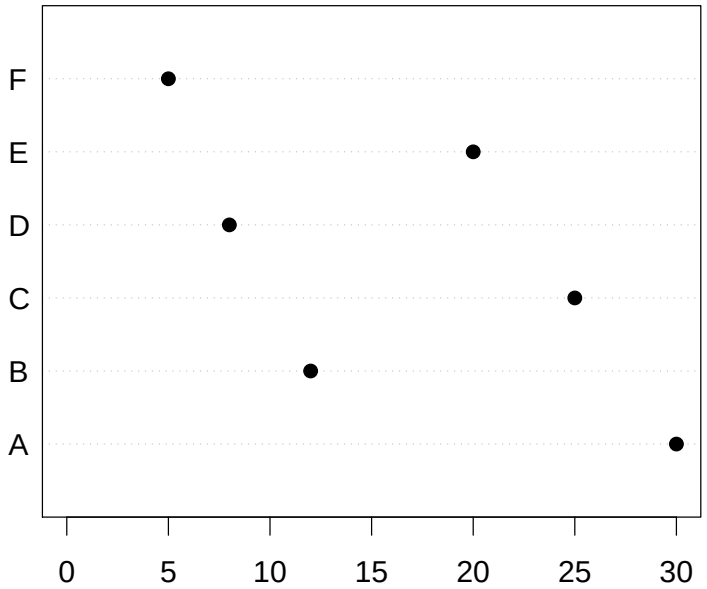
```
2-D pie charts are terrible. That makes 3-D pie charts terrible to
the 3/2 power.
   -- Frank Harrell
      R-help (April 2006)
```

Démo 4 : Figure 1 de Rangecroft 2003

```
library(plotrix)
g1 <- c(30, 12, 25, 8, 20, 5)
pie3D(rev(g1), col = "white",
  labels = LETTERS[6:1], start = pi/2,
  theta = pi/4)
```



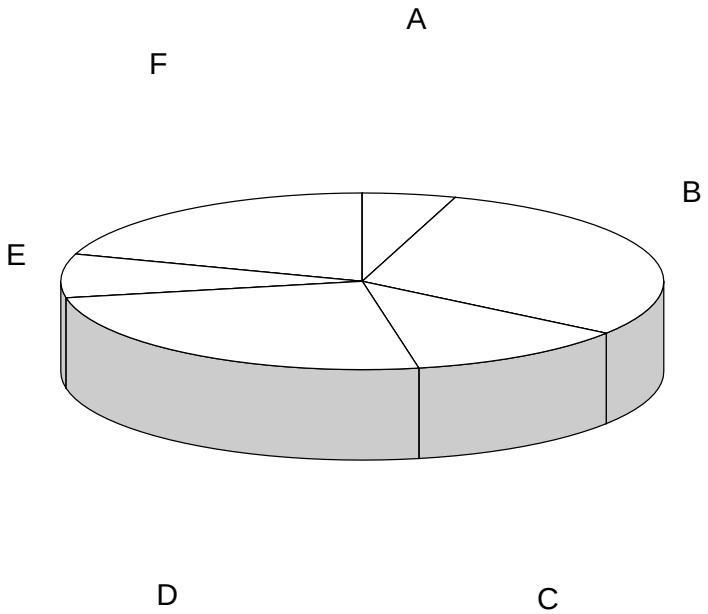

```
names(g1) <- LETTERS[1:6]
dotchart(g1, pch = 19, cex = 1.5,
  xlim = c(0, 30))
```

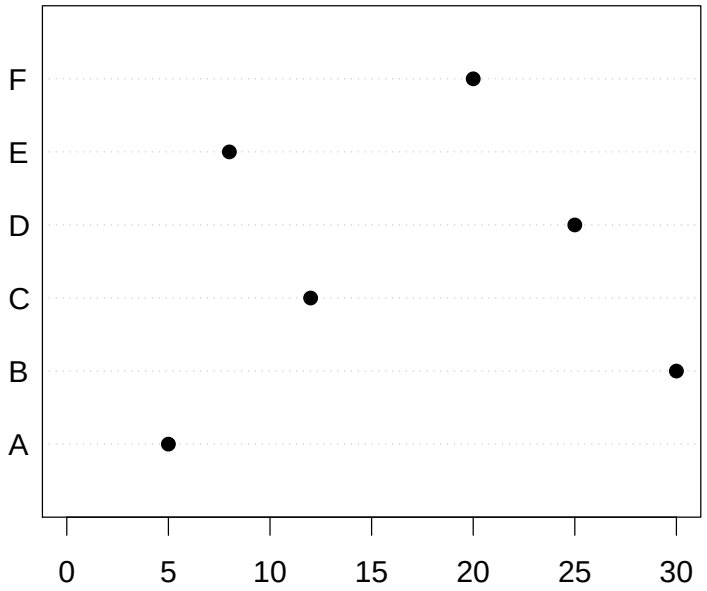


Démo 4 : Figure 2 de Rangecroft 2003

```
g2 <- c(5, 30, 12, 25, 8, 20)
pie3D(rev(g2), col = "white",
  labels = LETTERS[6:1], start = pi/2,
  theta = pi/4,
  sector.order=c(1,6,2,5,4,3))
```

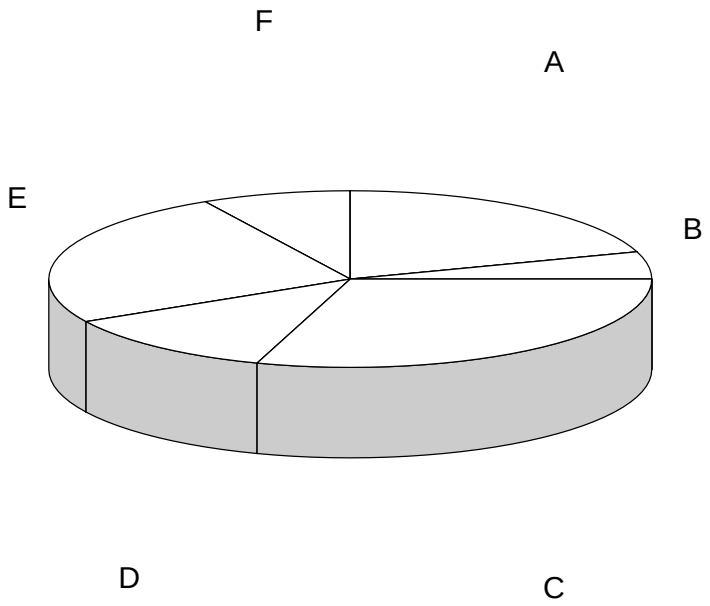
```
names(g2) <- LETTERS[1:6]
dotchart(g2, pch = 19, cex = 1.5,
  xlim = c(0, 30))
```



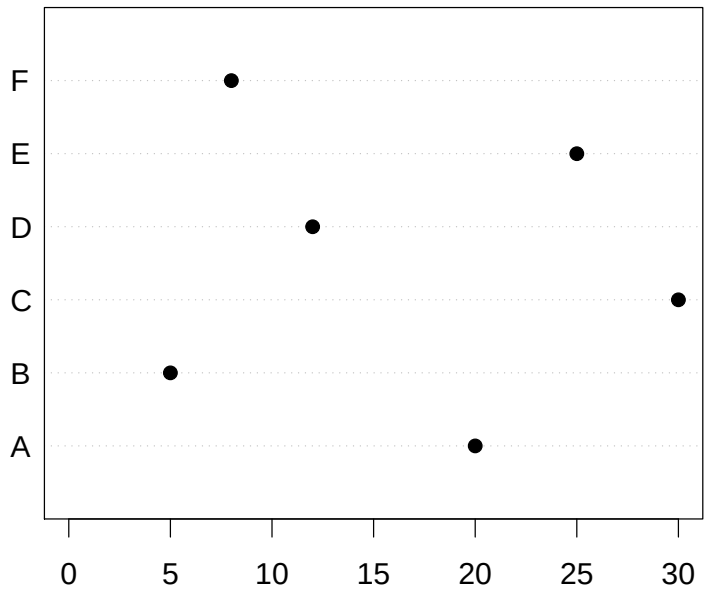


Démo 4 : Figure 3 de Rangecroft 2003

```
g3 <- c(20, 5, 30, 12, 25, 8)
pie3D(rev(g3), col = "white",
  labels = LETTERS[6:1], start = pi/2,
  theta = pi/4)
```

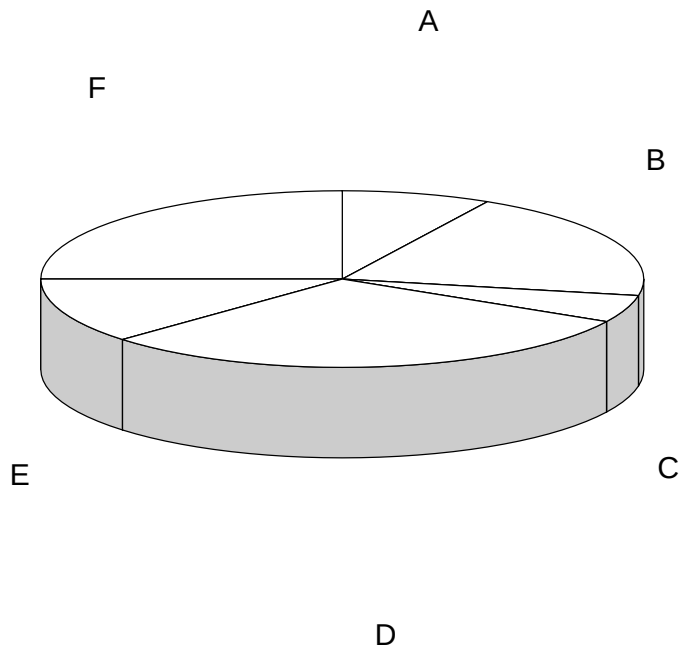



```
names(g3) <- LETTERS[1:6]
dotchart(g3, pch = 19, cex = 1.5,
  xlim = c(0, 30))
```

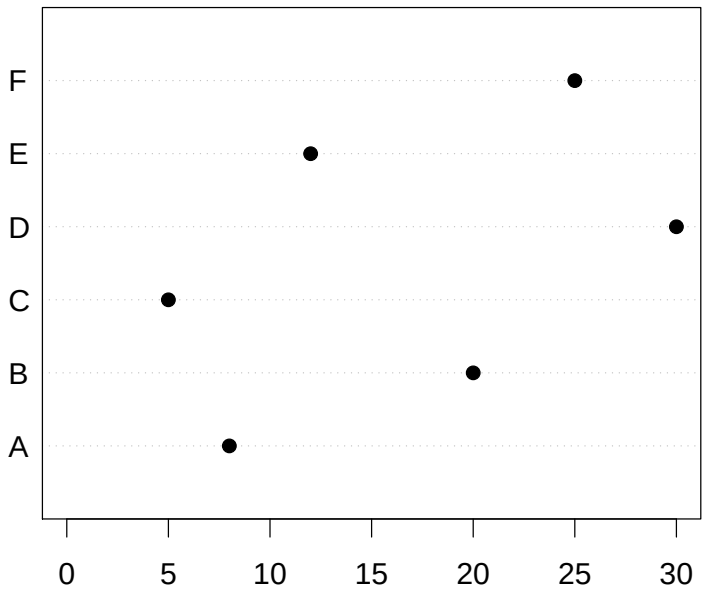


Démo 4 : Figure 4 de Rangecroft 2003

```
g4 <- c(8, 20, 5, 30, 12, 25)
pie3D(rev(g4), col = "white",
  labels = LETTERS[6:1], start = pi/2,
  theta = pi/4)
```



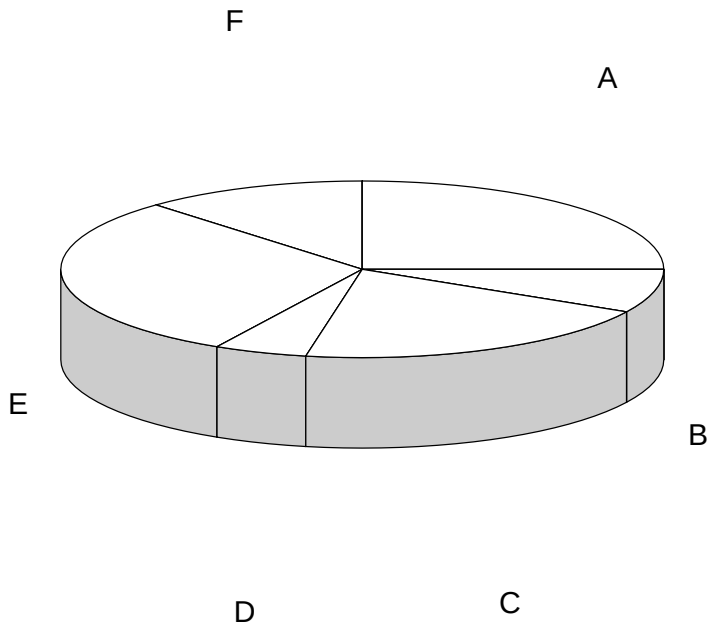

```
names(g4) <- LETTERS[1:6]
dotchart(g4, pch = 19, cex = 1.5,
  xlim = c(0, 30))
```

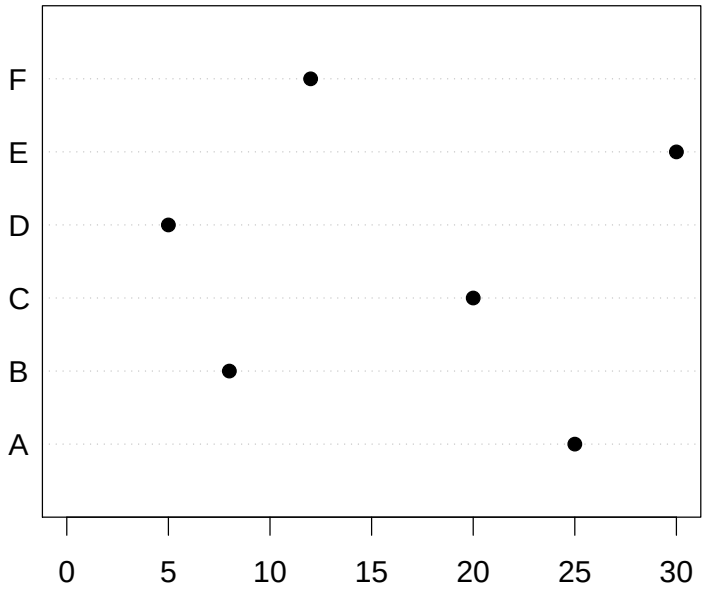


Démo 4 : Figure 5 de Rangecroft 2003

```
g5 <- c(25, 8, 20, 5, 30, 12)
pie3D(rev(g5), col = "white",
  labels = LETTERS[6:1], start = pi/2,
  theta = pi/4,
  sector.order=c(1,6,2,5,3,4))
```

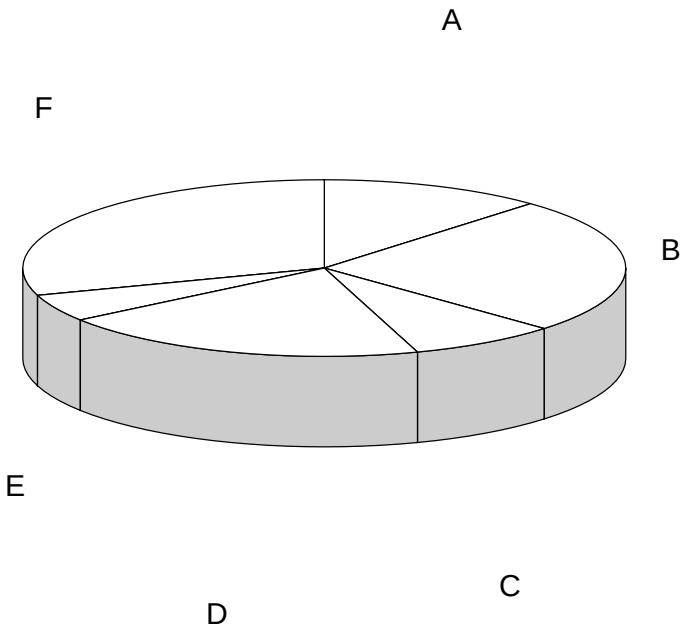
```
names(g5) <- LETTERS[1:6]
dotchart(g5, pch = 19, cex = 1.5,
  xlim = c(0, 30))
```



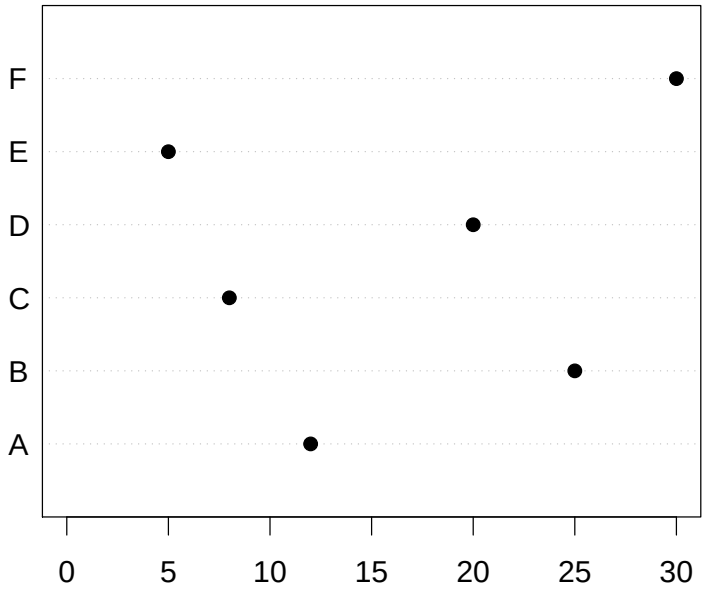


Démo 4 : Figure 6 de Rangecroft 2003

```
g6 <- c(12, 25, 8, 20, 5, 30)
pie3D(rev(g6), col = "white",
  labels = LETTERS[6:1], start = pi/2,
  theta = pi/4)
```




```
names(g6) <- LETTERS[1:6]
dotchart(g6, pch = 19, cex = 1.5,
  xlim = c(0, 30))
```



Démo 4 : Table 2 de Rangecroft 2003

Choix du plus petit secteur en % (n = 278). Réponse correcte.

Graph	A	B	C	D	E	F
1	0	0	3	68	0	29
2	24	0	6	3	68	0
3	0	97	0	0	0	3
4	3	0	94	0	3	0
5	0	27	0	74	0	0
6	0	0	3	0	97	0

Référence

Rangecroft, M. (2003) As easy as a pie. *Behaviour & Information Technology*, **22** :421-426.

Démo 4 : Table 3 de Rangecroft 2003

Choix du plus grand secteur en % (n = 278). Réponse correcte.

Graph	A	B	C	D	E	F
1	71	0	27	3	0	0
2	0	41	0	56	0	3
3	0	0	97	0	3	0
4	0	0	0	97	0	3
5	53	0	0	0	47	0
6	0	0	0	0	0	100

Référence

Rangecroft, M. (2003) As easy as a pie. *Behaviour & Information Technology*, **22** :421-426.

En guise de conclusion (Jorge Cham)