

Lightweight Language Spirit Language Update R言語

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R言語の概要 1

- SのシンタックスとSchemeのセマンティックスの**一部**を融合
 - S言語 ベル研究所が開発した統計処理言語
 - 強力なグラフィックス機能、動的スコープ
 - Scheme ここで説明する必要はないでしょう ^_^
 - 静的スコープ、遅延評価
- R 0.49 リリース(1997/4/23)
 - 現在の最新バージョンは2.5.1(2007/6/28)
- マルチプラットフォーム(<http://www.r-project.org>)で配布
 - Windows95以降、Mac OS X、UNIX(Linux、BSD、etc)
- 対話環境(バッチ処理も可能)
 - オブジェクトの中身を確認しながら操作ができる
- 多数の解析パッケージが公開(CRAN、Bioconductor他)
 - ネットワークで依存関係にある他パッケージをも自動インストール
- オープンソース
 - 個々のパッケージはライセンスが異なる(アカデミックフリーなど)

間違えて.net
と入力すると
大変なことに
なります!!

R言語の概要 2

- R言語の特徴
 - バージョンアップが頻繁
 - バージョンアップの際に整合性が失われることがある(欠点)
 - データはベクトルが基本
 - オブジェクト指向
 - 総称関数で様々なさまざまなデータ構造を一貫的に操作
 - 強力なヘルプシステム
 - さまざまな組み込みデータ
 - 意味のあるデータを適当に用意するのは困難
 - ソースの参照が可能
- R言語が活躍する場面
 - データマイニング、バイオインフォマティクス
 - バイオインフォマティクス論文でRでの実装例が非常に多い

R言語はベクトルデータが基本

```
R Console
> a <- 1:100
[1] 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
[19] 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36
[37] 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54
[55] 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72
[73] 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90
[91] 91 92 93 94 95 96 97 98 99 100
> is.vector(a)
[1] TRUE
> a <- 1
[1] 1
> is.vector(a)
[1] TRUE
> is.double(a)
[1] TRUE
> rnorm(4)
[1] -1.014894 1.129868 -0.953888 1.229495
> exp(rnorm(4))
[1] 2.1525806 2.4193886 1.7072813 4.410882
> exp(matrix(rnorm(4), nrow=2))
      [,1] [,2]
[1,] 0.8218919 1.7872385
[2,] 0.2584982 0.2221939
```

R言語のオブジェクト指向

```
R Console
> class(iris)
[1] "data.frame"
> dim(iris)
[1] 150 5
> summary(iris)
      Sepal.Length      Sepal.Width      Petal.Length      Petal.Width      Species
Min.   14.300      Min.   12.400      Min.   1.300      Min.   18.100      setosa   50
1st Qu. 15.100      1st Qu. 12.800      1st Qu. 11.400      1st Qu. 19.300      versicol 35
Median 15.800      Median 13.400      Median 14.350      Median 11.300      virginica 25
Mean   15.843      Mean   13.857      Mean   15.750      Mean   11.100
3rd Qu. 16.400      3rd Qu. 13.300      3rd Qu. 15.100      3rd Qu. 11.800
Max.   17.900      Max.   14.450      Max.   16.800      Max.   12.900

> iris.svm <- svm(Species ~ ., data = iris)
> class(iris.svm)
[1] "svm.formula" "svm"
> summary(iris.svm)
Call:
svm(formula = Species ~ ., data = iris)

Parameters:
  SVM-Type:  C-classification
  SVM-Kernel: radial
  cost: 1

irisデータセット
アヤメをかくと花弁それぞれの
幅と長さで三種類の品種に分類
サポートベクタマシン(SVM)
教師あり学習を行う識別手法の
一つ、今回は品種が教師データ
```

R言語でのドキュメント探索

```
R Console
> help.search("svm")
First 100 Results
Package: Method For Support Vector Machines
example(plot.svm)
iris.svm
svm
svm.train
svm.train2
svm.train3
svm.train4
svm.train5
svm.train6
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svm.train8
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