# tree_test

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29/09/2020

## Test functions:

### tree_grow

**Example input credit**

```
nmin <- 2
minleaf <- 1
nfeat <- ncol(credit.dat)-1
x <- credit.dat[,1:ncol(credit.dat)-1]
y <- credit.dat[,ncol(credit.dat)]

tree_grow(x, y, nmin, minleaf, nfeat)
```

```
##          location split feat_name majority_left majority_right
## income          0  36.0    income             0              1
## age             1  37.0       age             0              1
## married         4   0.5   married             0              1
```

**Example input pima**

```
nmin <- 20
minleaf <- 5
nfeat <- ncol(pima.dat)-1
x <- pima.dat[,1:ncol(pima.dat)-1]
y <- pima.dat[,ncol(pima.dat)]

tree_grow(x, y, nmin, minleaf, nfeat)
```

```
##     location     split feat_name majority_left majority_right
## 1          0 127.5000      X148             0              1
## 2          1  28.5000       X50             0              0
## 3          2  29.9500     X33.6             0              1
## 4          3  45.4000     X33.6             0              1
## 5          4  26.3500     X33.6             0              0
## 6          5 145.5000      X148             0              1
## 7          6 157.5000      X148             1              1
## 8          7  30.9500     X33.6             0              0
## 9          9   9.6500     X33.6             1              0
## 10        10  99.5000      X148             0              0
## 11        11 132.5000        X0             0              0
## 12        12  25.5000       X50             0              1
## 13        13  30.5000       X50             0              1
```

```
## 14      14 629.5000      X0        1        0
## 15      15   7.5000      X6        0        1
## 16      16   0.5005  X0.627        0        0
## 17      19  28.5000    X148        1        0
## 18      20   0.5610  X0.627        0        1
## 19      21  28.1500   X33.6        0        1
## 20      24  61.0000     X50        1        0
## 21      25  61.0000     X72        1        0
## 22      26   0.4295  X0.627        1        1
## 23      27   0.3005  X0.627        1        1
## 24      29   0.6720  X0.627        0        0
## 25      31  53.0000     X72        1        0
## 26      32  69.0000     X72        0        0
## 27      34   0.7960  X0.627        0        1
## 28      35   0.2000  X0.627        0        0
## 29      36   6.5000      X6        1        1
## 30      37  73.0000     X72        0        0
## 31      39  27.1000   X33.6        1        0
## 32      42  41.8000   X33.6        0        1
## 33      43  45.5500   X33.6        0        1
## 34      44 333.5000      X0        1        0
## 35      45   0.2885  X0.627        1        0
## 36      46  44.0000     X50        1        1
## 37      50  36.5000      X0        0        0
## 38      51  88.5000    X148        0        1
## 39      52   1.0980  X0.627        0        1
## 40      53  94.5000    X148        0        0
## 41      55  27.6500   X33.6        1        0
## 42      56   1.5000      X6        1        0
## 43      57 120.5000      X0        0        1
## 44      63   1.1415  X0.627        0        1
## 45      65   0.1365  X0.627        1        0
## 46      67  40.0500   X33.6        1        1
## 47      69  37.5000     X50        1        1
## 48      73  34.0000      X0        0        1
## 49      77   5.5000     X35        0        0
## 50      79  11.5000      X6        0        0
## 51      82   5.5000      X6        0        0
## 52      84  67.0000     X72        1        0
## 53      87   4.5000      X6        0        1
## 54      90  32.4500   X33.6        0        1
## 55      95  33.6500   X33.6        0        0
## 56     104  34.4500   X33.6        0        0
## 57     105  73.0000     X72        0        0
## 58     111  83.0000     X72        1        0
```

## tree_predict

**Example input credit**

```r
nmin <- 2
minleaf <- 1
nfeat <- ncol(credit.dat)-1
x <- credit.dat[,1:ncol(credit.dat)-1]
```

```r
y <- credit.dat[,ncol(credit.dat)]
tr <- tree_grow(x, y, nmin, minleaf, nfeat)

y_hat <- tree_pred(x, tr)
y_hat
```

```
## [1] 0 0 0 0 0 1 1 1 1 1
```

**Example input pima**

```r
nmin <- 20
minleaf <- 5
nfeat <- ncol(pima.dat)-1
x <- pima.dat[,1:ncol(pima.dat)-1]
y <- pima.dat[,ncol(pima.dat)]
tr <- tree_grow(x, y, nmin, minleaf, nfeat)

y_hat <- tree_pred(x, tr)
y_hat
```

```
##   [1] 0 1 0 1 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 1 1 0 0 1 0 1 0 0 0 0 0 0 0 0 0 1 0
##  [38] 1 0 0 1 0 0 0 0 1 0 0 0 0 0 0 0 0 1 0 0 0 1 0 0 1 0 0 0 1 0 0 0 0 1 1 0 0 0
##  [75] 0 1 0 0 0 0 0 1 0 1 1 0 0 1 0 0 0 1 0 0 1 0 0 0 0 0 0 0 0 1 0 0 1 0 0 0 1
## [112] 0 0 0 1 0 1 0 0 0 0 0 0 0 1 0 0 0 0 0 0 1 0 0 0 0 1 0 0 0 0 0 0 0 1 0 1
## [149] 0 1 0 1 1 0 1 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 1 1 0 1 1 1 1 0 1 0 0 0 0
## [186] 0 1 0 0 0 0 0 1 0 0 0 0 1 0 1 0 0 0 0 0 0 0 0 0 1 0 1 0 1 1 0 1 0 0 0 0
## [223] 1 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0 0 0 1
## [260] 0 0 1 1 0 1 1 0 0 0 0 0 0 0 1 0 0 0 0 1 1 1 0 0 1 1 0 0 0 0 1 1 1 0 0 0
## [297] 0 0 0 0 0 1 1 0 0 0 1 1 0 0 1 1 0 0 0 0 0 0 0 1 0 0 1 0 0 0 0 1 0 0 0 0 0
## [334] 0 0 0 0 1 0 0 0 0 0 1 0 0 0 0 1 1 0 1 0 1 0 1 1 1 0 0 0 0 1 0 1 0 0 0 1 0
## [371] 0 1 0 1 1 0 1 1 1 0 0 0 0 0 0 0 0 0 1 1 0 0 1 0 0 0 0 0 0 0 1 0 1 1 0 1 0 0
## [408] 1 0 1 1 1 0 1 0 0 1 0 0 1 0 0 0 1 0 0 0 0 1 0 1 0 0 0 0 1 1 0 0 0 0 0 0
## [445] 0 0 0 1 0 0 0 0 0 0 0 0 0 1 0 0 0 1 1 0 0 0 1 0 0 1 0 0 0 0 0 0 0 0 0 0
## [482] 0 0 1 1 1 0 0 1 1 1 1 0 0 0 0 0 0 1 0 0 1 1 1 1 0 1 0 0 1 1 0 0 0 0 1 0 1
## [519] 1 0 0 0 1 0 0 0 0 0 0 0 0 1 1 1 1 0 0 0 1 1 0 0 1 0 1 0 1 0 0 0 0 1 0 1 0 0 0 0
## [556] 1 0 0 1 0 0 0 1 1 0 0 1 1 0 1 0 0 0 1 0 0 1 0 0 1 0 0 1 0 0 0 0 1 0 0 0 0 1
## [593] 1 0 0 1 0 0 0 0 0 0 1 0 1 0 0 0 0 0 0 0 1 1 0 0 0 0 0 0 0 0 0 0 1 0 1 1 0
## [630] 0 0 0 1 0 0 0 1 1 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 1 0 0 1
## [667] 0 1 1 0 0 1 1 1 0 0 0 0 0 0 0 1 0 0 0 0 1 1 0 0 1 1 0 1 0 0 1 1 0 0 0 1
## [704] 0 0 0 0 0 1 0 0 1 1 0 0 0 0 0 1 1 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 1 0 0 0
## [741] 0 0 1 1 0 1 1 0 0 0 0 0 0 1 1 1 0 0 0 0 0 0 0 0 0 0 0
```

## Bagging and random forrest

**Example input credit**

```r
nmin <- 2
minleaf <- 1
nfeat <- ncol(credit.dat)-1
x <- credit.dat[,1:ncol(credit.dat)-1]
y <- credit.dat[,ncol(credit.dat)]
trs <- tree_grow_b(x, y, nmin, minleaf, nfeat, 3)

y_hat <- tree_pred_b(x, trs)
```

```
y_hat
```

```
## [1] 1 1 1 1 0 1 1 1 0 0
```