````
---
title: "mars"
output: rmarkdown::html_vignette
vignette: >
  %\VignetteIndexEntry{mars}
  %\VignetteEngine{knitr::rmarkdown}
  %\VignetteEncoding{UTF-8}
---

```{r, include = FALSE}
knitr::opts_chunk$set(
  collapse = TRUE,
  comment = "#>"
)
```

## Getting started

Install the package.
Load the package
```{r setup}
# library(mars)
```



## Introduction
````

The MARS package is designed to solve complex non-linear regression problems using recursive partitioning as defined in Friedman's paper, Multivariate Adaptive Regression Splines (1991).

The acronym 'MARS' stands for Multivariate Adaptive Regression Splines and is technically trademarked. However, seeing as this package will not be publicly released, we hope for forgiveness in this infringement.

The MARS algorithm

The model we receive at the end from the mars algorithm is a many basis functions in a linear combination, found by least squares

We input a formula, data frame & control object. It uses step-wise algorithms to fit.

Forward pass

The forward pass algorithm takes as input formula & data then tries to return a matrix of basis functions.

Backwards pass

The backwards pass algorithm, unlike the forward pass, see the difference in subsets of basis functions.

Calling mars()

```{r}
# mars(y~.,dat=mars::marstestdata)
```

```

## Using mars methods

### Predict():

Predict with an mars model for new data, returns the predicted basis function.

```{r}
predict
```

Plot():

plots the fitted basis function, made up of 1 to 2 hinge functions. Depends on main effects (1 exp variable) or two-way interactions (2 exp variables)

```{r}
plot
```

Summary():

prints a summary of the mars object with the function call. Also prints the summary of the hinges of each basis function.

Takes as input a mars object

Returns a summary of the mars object

```{r}
summary
```

Print():

Prints out a mars object
```

```{r}
print
```

References

Jerome H. Friedman. Multivariate Adaptive Regression Splines (with discussion). Annals of Statistics 19/1, 1991. https://statistics.stanford.edu/research/multivariate-adaptive-regression-splines.