Multi-layer Perceptron: nagdmc_predict_mlp

Purpose

nagdmc_predict_mlp computes predictions given a fitted multi-layer perceptron (MLP) model as returned by **nagdmc_mlp**.

Declaration

```
#include <nagdmc.h>
void nagdmc_predict_mlp(double data[], double model[], double *fv, int *info);
```

Parameters

1:	data[] - double	Input
	On entry: a single data record with the independent variables in the same indexes as the model.	used to fit
2:	$\mathbf{model}[] - \texttt{double}$	Input
	On entry: the fitted MLP model as returned by nagdmc_mlp .	
3:	${f fv}-{f double}$ *	Output
	On exit: the predicted value computed by the MLP model.	
4:	info - int *	Output
	On exit: info gives information on the success of the function call:	

46: the model information has been corrupted.

Notation

Description

A fully connected, feed-forward multi-layer perceptron with d input units, m units in its hidden layer and a single output unit calculates a prediction z for the dependent variable in a data record x by evaluating:

$$z = \psi \left(\sum_{k=1}^{m} w_k \phi \left(\sum_{j=1}^{d} w_{jk} x_j - \theta \right) - \eta \right),$$

where:

- (a) w_{jk} denotes the weight value that connects the *i*th unit in the input layer to the *k*th unit in the hidden layer, for j = 1, 2, ..., d; for k = 1, 2, ..., m.
- (b) θ is the threshold value subtracted at the hidden layer.
- (c) w_k denotes the weight value that connects the kth unit in the hidden layer to the single unit in the output layer, for k = 1, 2, ..., m.
- (d) η is the threshold value subtracted at the single unit in the output layer.
- (e) $\phi(\cdot)$ is the activation function applied at the hidden layer.
- (f) $\psi(\cdot)$ is the activation function applied at the output layer.

See the 'Description' in **nagdmc_mlp** for further detail.

The weight and threshold values and information required to define the activation functions are passed to **nagdmc_predict_mlp** by the parameter named **model**.

References and Further Reading

None.

See Also

nagdmc_mlpcomputes a fully connected feed-forward MLP.mlp_ex.cthe example calling program.