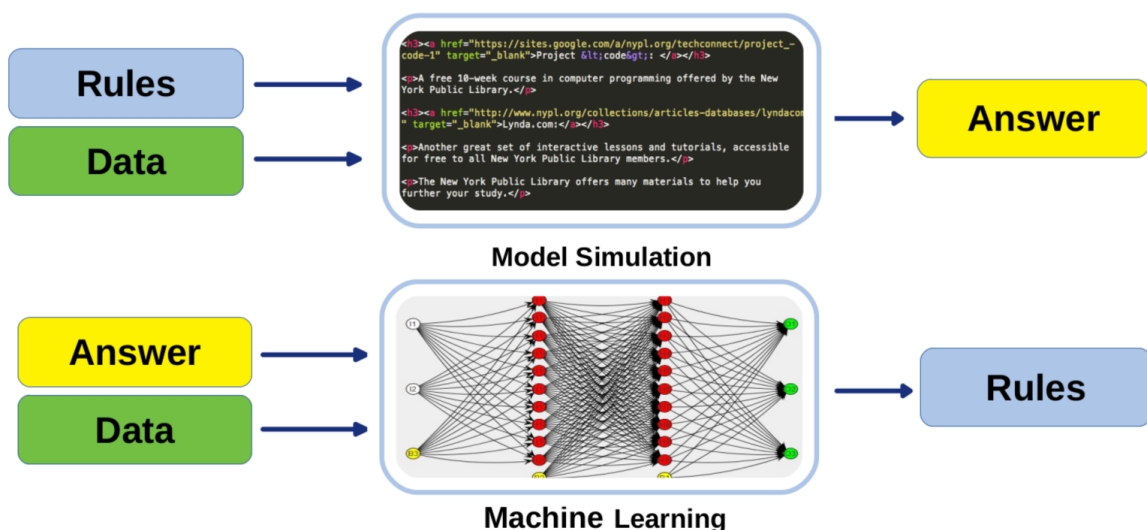


## General Regression Neural Networks for feature selection in binary classification

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Natural catastrophes, such as landslides and forest fires have severe environmental and societal effects, thus a thorough understanding of what causes these events and what risks they bear is of utmost importance. Measured data, however, are related to occurrence of these — fortunately rare — events, and has to be complemented by simulation results. The interpretation of both can be aided by machine learning algorithms, which, among other uses can serves as tools for classification and data selection. In the present work we propose to study these natural phenomena using General Regression Neural Networks as tools for feature selection.

Machine learning is a collective name for algorithms and statistical models which perform a specific task without explicit instructions relying on an a priori definition of the underlying physical — or in general cognitive — concepts of the modeled phenomena, using only statistical data and inference. A machine learning algorithm uses a training dataset to build a model which performs predictions on any other dataset. The development of artificial neural networks (ANN) as non-parametric data processing tools is connected to the emergence of machine learning methods. ANNs consist of a number of simple processing units, which are loosely connected, similarly — as the name suggests — to neurons in a nervous systems. These networks can be globally programmed to perform a specific task, even if the underlying mathematical model is not explicitly established.



**Figure:** Machine Learning — Artificial Neural Networks — concept.