**Algorithm 1** Multiple Regression Analysis

**Require:** Dataset $D$, number of independent variables $n$, dependent variable $y$
**Ensure:** Regression coefficients $\beta_1, \beta_2, \ldots, \beta_n$, intercept $\beta_0$

1: Initialize model parameters $\beta_0, \beta_1, \beta_2, \ldots, \beta_n$ to 0
2: Construct the design matrix $X$, where each row corresponds to a sample and each column corresponds to an independent variable
3: Compute the transpose of matrix $X$, denoted as $X^T$
4: Compute the inverse of matrix $X^T X$, denoted as $(X^T X)^{-1}$
5: Compute the regression coefficients: $\beta = (X^T X)^{-1} X^T y$
6: **return** $\beta_0, \beta_1, \beta_2, \ldots, \beta_n$