Algorithm 1: NPDR

input: Dataset X with m observations and p attributes
Outcome y (continuous or categorical) and optional covariates

Pre-process X (continuous or categorical attributes)
Compute distance matrix D (Eq. 1) from X
Find neighbors $\mathcal{N}$ (Eq. 3) from D by neighbor method (adaptive/fixed)
$\mathbf{d}(y)$ = distance vector among neighbors $\mathcal{N}$ for outcome y (Eq. 2 or 16)
$\mathbf{d}(\text{cov})$ = optional distance vector among neighbors $\mathcal{N}$ for covariates
for *attribute* $a := 1$ *to* p **do**
    $\mathbf{d}(a)$ = distance vector among neighbors $\mathcal{N}$ for attribute a
    β_a = coefficient of $\mathbf{d}(a)$ from $\mathbf{d}(y) \sim \mathbf{d}(a) + \mathbf{d}(\text{cov})$ (Eq. 11 or 15)
    β'_a = standardized β_a regression coefficient
output: vector of all attribute importances $\boldsymbol{\beta'}$