# Key Input Parameters for CLEAR

## General input- parameters for CLEAR

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| case_study | The name of the UCI dataset that will be used to create the MLP (the explanandum). There are five options (i) Census (ii) PIMA (iii) Credit Card (iv) BreastC (v) Iris. |
| max_predictors | The maximum number of independent variables to be used in a regression. The actual number used may be smaller if CLEAR determines that adding additional variables does not improve the score of its stepwise regression. |
| first_obs, last_obs | The index numbers of the test dataset observations whose predictions are to be explained. For example, if 'first_obs'=1 and 'last_obs' =5 then the predictions for the first five observations of the test dataset will be explained. In order to explain a single prediction, set 'first_obs' and 'last_obs' to the same number eg if 'first_obs'= 7, 'last_obs'=7 then the prediction for observation 7 will be explained. |
| num_samples | The total number of synthetic data points to be generated. The default value is 50,000. |
| regression_type | Set to either 'multiple' or 'logistic' |
| score_type | For logistic regression this can be set to either 'prsquared' (for McFadden's pseudo R-squared) or to 'AIC'. For multiple regression this can be set to 'adjR' (adjusted R-squared) or to AIC. In the Neurips paper prsquared and adjR were used. |
| regression_sample_size | The number of synthetic observations to use in a local regression (default 200) |
| neighbourhood_algorithm | 'Balanced' or 'Unbalanced' |
| CLEAR_path | The working directory for CLEAR |
| apply_counterfactuals | True/False. Add w-counterfactuals to the neighbourhood datasets used for the local regressions |
| counterfactual_weights | The weighting to give to each counterfactual observations in the neighbourhood dataset |
| generate_regression_files | Create csv file of the neighbourhood dataset named 'local'_date/time.csv eg 'local_20190930.csv' |
| with_indicator_feature | True/False. Whether to include an indicator variable in the regressions |
| feature_with_indicator | Feature that is to have an indicator variable |
| indicator_threshold | The threshold for the indicator variable. |

| 'perturb_one_feature' | True/False. Only generate w-counterfactuals for one feature. This was created just for the Census dataset, where only 'age' was perturbed. The only other numeric features was 'hoursPerweek' which did not not have sufficient variance to provide a basis for calculating w-counterfactuals. |
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| only_feature_perturbed | This accompanies 'perrturb_one_feature' and is set to 'age' for the Census dataset. |
| multi_class | True/False. Set to 'True' for multi-class datasets such as Iris |
| multi_class_labels | List of class labels for multi-class dataset e.g. ['setosa','versicolor','virginica'] |
| multi_class_focus | 'All' = determine b-perturbations for all classes. Otherwise specify a target class e.g. 'setosa' |

Parameters created to demonstrate the incremental benefits of CLEAR's functionality

| no_polynomials | True/False. Only perform simple regressions i.e. no 2nd order or interaction terms |
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| interaction_only | True/False. Allow interaction terms bur not 2nd order terms. |
| no_centering | True/False. Do not center the regressions i.e. force the regression to go through the observation $x$ whose prediction is to be explained. |
| LIME_comparison | True/False. Runs CLEAR using LIME's algorithms for creating the neighbourhood datasets and generating regressions |