LOGISTIC REGRESSION

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| parameters | parameter grid | hyperparameters | | |
| Complete df | Worried | Unworried |
| 'solver' | 'newton-cg', 'lbfgs', 'liblinear' | 'lbfgs' | 'lbfgs' | 'newton-cg' |
| 'penalty' | ‘l2' | ‘l2' | ‘l2' | ‘l2' |
| 'c' | 100, 10, 1.0, 0.1, 0.01 | 0.1 | 0.1 | 10 |

DECISION TREE

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameters** | **Parameter Grid** | **Hyperparameters** | | |
| **Complete dataset** | Worried | Unworried |
| 'criterion' | 'gini', 'entropy' | 'entropy' | 'gini' | 'entropy' |
| 'max\_depth' | range(1, 10) | 8 | 7 | 5 |
| 'min\_samples\_split' | range(1, 10) | 4 | 6 | 8 |
| 'min\_samples\_leaf' | range(1, 5) | 1 | 3 | 2 |
| ccp\_alpha |  | 0.00099 | 0.00222 | 0.00939 |

RANDOM FOREST

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameters** | **Parameter Grid** | **Hyperparameters** | | |
| **Complete Dataset** | Worried | Unworried |
| 'n\_estimators' | 50, 120, 190, 260, 330, 400 | 400 | 400 | 120 |
| 'max\_depth' | 5, 8, 15, 25, 30, None | 25 | 30 | 25 |
| 'min\_samples\_split' | 2, 5, 10, 15, 100 | 5 | 2 | 100 |
| 'min\_samples\_leaf' | 1, 2, 5, 10 | 2 | 1 | 5 |
| 'max\_features' | 'auto', 'sqrt', 'log2' | 'log2' | 'auto' | 'log2' |
| 'bootstrap' | True, False | True | True | False |

GRADIENT BOOSTING

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameters** | **Parameter Grid** | **Hyperparameters** | | |
| **Complete Dataset** | **Subset of Worried Citizens** | **Subset of Unworried Citizens** |
| 'max\_depth' | 3, 4, 5 | 3 | 4 | 120 |
| 'learning\_rate' | 0.1, 0.25, 0.5, 0.75, 1 | 0.1 | 0.25 | 0.1 |
| 'n\_estimators' | 50, 100, 150, 250 | 150 | 150 | 150 |
| 'gamma' | 0.5, 1, 1.5, 2 | 2 | 1 | 1 |
| 'min\_child\_weight' | 1, 5, 10 | 5 | 1 | 1 |
| scale\_pos\_weight | 0.1, 0.25, 0.5, 0.75, 1 | 0.75 | 0.5 | 1 |