# All variables without tuition with\_cv\_3

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Model | best\_params | best\_score | best\_model | confusion\_matrix | TP (mean) | FP (mean) | FN (mean) | TN (mean) | precision | recall | f1\_score | training\_time |
| CART | {'max\_depth': 5, 'min\_samples\_split': 2} | 0.8708484417585021 | DecisionTreeClassifier(max\_depth=5) | [[217 60]  [ 33 416]] | 416 | 60 | 33 | 217 | 0.8716795610806306 | 0.871900826446281 | 0.8704889040717918 | 1.215276718139648 |
| Random Forest | {'max\_features': 'sqrt', 'n\_estimators': 100} | 0.8949567484299088 | RandomForestClassifier() | [[225 52]  [ 29 420]] | 420 | 52 | 29 | 225 | 0.8883029119188929 | 0.8884297520661157 | 0.8874065611065154 | 27.80262041091919 |
| LightGBM | {'learning\_rate': 0.1, 'num\_leaves': 100} | 0.8959947861120987 | LGBMClassifier(num\_leaves=100) | [[235 42]  [ 25 424]] | 424 | 42 | 25 | 235 | 0.9075724152294578 | 0.9077134986225895 | 0.9071100316202683 | 9.424013137817383 |
| XGBoost | {'max\_depth': 3, 'n\_estimators': 50} | 0.8973764664059722 | XGBClassifier(base\_score=None, booster=None, callbacks=None,  colsample\_bylevel=None, colsample\_bynode=None,  colsample\_bytree=None, device=None, early\_stopping\_rounds=None,  enable\_categorical=True, eval\_metric=None, feature\_types=None,  gamma=None, grow\_policy=None, importance\_type=None,  interaction\_constraints=None, learning\_rate=None, max\_bin=None,  max\_cat\_threshold=None, max\_cat\_to\_onehot=None,  max\_delta\_step=None, max\_depth=3, max\_leaves=None,  min\_child\_weight=None, missing=nan, monotone\_constraints=None,  multi\_strategy=None, n\_estimators=50, n\_jobs=None,  num\_parallel\_tree=None, random\_state=None, ...) | [[231 46]  [ 27 422]] | 422 | 46 | 27 | 231 | 0.8992825747582619 | 0.8994490358126722 | 0.8987052462325993 | 9.267918825149536 |

# Before 1st sem without tuition\_cv\_3

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Model | best\_params | best\_score | best\_model | confusion\_matrix | TP (mean) | FP (mean) | FN (mean) | TN (mean) | precision | recall | f1\_score | training\_time |
| CART | {'max\_depth': 5, 'min\_samples\_split': 2} | 0.7279843583362957 | DecisionTreeClassifier(max\_depth=5) | [[204 73]  [114 335]] | 335 | 73 | 114 | 204 | 0.752565191313804 | 0.7424242424242424 | 0.745137320866609 | 1.004882097244263 |
| Random Forest | {'max\_features': 'log2', 'n\_estimators': 200} | 0.7493162697002015 | RandomForestClassifier(max\_features='log2', n\_estimators=200) | [[183 94]  [ 94 355]] | 355 | 94 | 94 | 183 | 0.7410468319559229 | 0.7410468319559229 | 0.7410468319559229 | 28.00982165336609 |
| LightGBM | {'learning\_rate': 0.05, 'num\_leaves': 31} | 0.7606754354781371 | LGBMClassifier(learning\_rate=0.05) | [[190 87]  [ 82 367]] | 367 | 87 | 82 | 190 | 0.7664611526701918 | 0.7672176308539945 | 0.7668020713111344 | 8.03980016708374 |
| XGBoost | {'max\_depth': 3, 'n\_estimators': 50} | 0.7627586206896552 | XGBClassifier(base\_score=None, booster=None, callbacks=None,  colsample\_bylevel=None, colsample\_bynode=None,  colsample\_bytree=None, device=None, early\_stopping\_rounds=None,  enable\_categorical=True, eval\_metric=None, feature\_types=None,  gamma=None, grow\_policy=None, importance\_type=None,  interaction\_constraints=None, learning\_rate=None, max\_bin=None,  max\_cat\_threshold=None, max\_cat\_to\_onehot=None,  max\_delta\_step=None, max\_depth=3, max\_leaves=None,  min\_child\_weight=None, missing=nan, monotone\_constraints=None,  multi\_strategy=None, n\_estimators=50, n\_jobs=None,  num\_parallel\_tree=None, random\_state=None, ...) | [[192 85]  [ 76 373]] | 373 | 85 | 76 | 192 | 0.7770221306761511 | 0.778236914600551 | 0.7775061011190347 | 9.305044412612915 |

# Before 2nd sem without tuition\_cv\_3

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Model | best\_params | best\_score | best\_model | confusion\_matrix | TP (mean) | FP (mean) | FN (mean) | TN (mean) | precision | recall | f1\_score | training\_time |
| CART | {'max\_depth': 5, 'min\_samples\_split': 2} | 0.8467626496030336 | DecisionTreeClassifier(max\_depth=5) | [[200 77]  [ 34 415]] | 415 | 77 | 34 | 200 | 0.84777109028772 | 0.8471074380165289 | 0.844167875167461 | 1.179312467575073 |
| Random Forest | {'max\_features': 'sqrt', 'n\_estimators': 100} | 0.8674214954378481 | RandomForestClassifier() | [[213 64]  [ 26 423]] | 423 | 64 | 26 | 213 | 0.8772175600858676 | 0.8760330578512396 | 0.8739848065958004 | 26.66541695594788 |
| LightGBM | {'learning\_rate': 0.05, 'num\_leaves': 31} | 0.8732717146581347 | LGBMClassifier(learning\_rate=0.05) | [[227 50]  [ 28 421]] | 421 | 50 | 28 | 227 | 0.8924514741061625 | 0.8925619834710744 | 0.8916251057035329 | 8.651665210723877 |
| XGBoost | {'max\_depth': 3, 'n\_estimators': 50} | 0.8701765612039342 | XGBClassifier(base\_score=None, booster=None, callbacks=None,  colsample\_bylevel=None, colsample\_bynode=None,  colsample\_bytree=None, device=None, early\_stopping\_rounds=None,  enable\_categorical=True, eval\_metric=None, feature\_types=None,  gamma=None, grow\_policy=None, importance\_type=None,  interaction\_constraints=None, learning\_rate=None, max\_bin=None,  max\_cat\_threshold=None, max\_cat\_to\_onehot=None,  max\_delta\_step=None, max\_depth=3, max\_leaves=None,  min\_child\_weight=None, missing=nan, monotone\_constraints=None,  multi\_strategy=None, n\_estimators=50, n\_jobs=None,  num\_parallel\_tree=None, random\_state=None, ...) | [[217 60]  [ 34 415]] | 415 | 60 | 34 | 217 | 0.8701960029968571 | 0.8705234159779615 | 0.8691571857894171 | 9.46544098854065 |

# During 1st sem without tuition\_cv\_3

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Model | best\_params | best\_score | best\_model | confusion\_matrix | TP (mean) | FP (mean) | FN (mean) | TN (mean) | precision | recall | f1\_score | training\_time |
| CART | {'max\_depth': 5, 'min\_samples\_split': 10} | 0.7551617490223961 | DecisionTreeClassifier(max\_depth=5, min\_samples\_split=10) | [[184 93]  [ 87 362]] | 362 | 93 | 87 | 184 | 0.7511021685459794 | 0.7520661157024794 | 0.7515316028552195 | 0.9183807373046875 |
| Random Forest | {'max\_features': 'sqrt', 'n\_estimators': 200} | 0.7627408460718094 | RandomForestClassifier(n\_estimators=200) | [[186 91]  [ 85 364]] | 364 | 91 | 85 | 186 | 0.7566364754556637 | 0.7575757575757576 | 0.7570531227917702 | 29.18571043014526 |
| LightGBM | {'learning\_rate': 0.05, 'num\_leaves': 31} | 0.7758336295769641 | LGBMClassifier(learning\_rate=0.05) | [[190 87]  [ 79 370]] | 370 | 87 | 79 | 190 | 0.7702114787201045 | 0.7713498622589532 | 0.7706842625566286 | 8.488213539123535 |
| XGBoost | {'max\_depth': 3, 'n\_estimators': 50} | 0.772731366275625 | XGBClassifier(base\_score=None, booster=None, callbacks=None,  colsample\_bylevel=None, colsample\_bynode=None,  colsample\_bytree=None, device=None, early\_stopping\_rounds=None,  enable\_categorical=True, eval\_metric=None, feature\_types=None,  gamma=None, grow\_policy=None, importance\_type=None,  interaction\_constraints=None, learning\_rate=None, max\_bin=None,  max\_cat\_threshold=None, max\_cat\_to\_onehot=None,  max\_delta\_step=None, max\_depth=3, max\_leaves=None,  min\_child\_weight=None, missing=nan, monotone\_constraints=None,  multi\_strategy=None, n\_estimators=50, n\_jobs=None,  num\_parallel\_tree=None, random\_state=None, ...) | [[192 85]  [ 80 369]] | 369 | 85 | 80 | 192 | 0.7719910951965888 | 0.7727272727272727 | 0.7723215489132377 | 9.389091730117798 |

# During 2nd sem without tuition\_cv\_3

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Model | best\_params | best\_score | best\_model | confusion\_matrix | TP (mean) | FP (mean) | FN (mean) | TN (mean) | precision | recall | f1\_score | training\_time |
| CART | {'max\_depth': 5, 'min\_samples\_split': 10} | 0.8471027372911483 | DecisionTreeClassifier(max\_depth=5, min\_samples\_split=10) | [[200 77]  [ 34 415]] | 415 | 77 | 34 | 200 | 0.84777109028772 | 0.8471074380165289 | 0.844167875167461 | 1.10846996307373 |
| Random Forest | {'max\_features': 'log2', 'n\_estimators': 200} | 0.8687984358336296 | RandomForestClassifier(max\_features='log2', n\_estimators=200) | [[209 68]  [ 24 425]] | 425 | 68 | 24 | 209 | 0.8753950091956468 | 0.8732782369146006 | 0.8707713395407118 | 26.62297320365906 |
| LightGBM | {'learning\_rate': 0.05, 'num\_leaves': 50} | 0.8753371252518072 | LGBMClassifier(learning\_rate=0.05, num\_leaves=50) | [[225 52]  [ 28 421]] | 421 | 52 | 28 | 225 | 0.8897828530565497 | 0.8898071625344353 | 0.8887464104625692 | 8.675363302230835 |
| XGBoost | {'max\_depth': 3, 'n\_estimators': 100} | 0.867767507998578 | XGBClassifier(base\_score=None, booster=None, callbacks=None,  colsample\_bylevel=None, colsample\_bynode=None,  colsample\_bytree=None, device=None, early\_stopping\_rounds=None,  enable\_categorical=True, eval\_metric=None, feature\_types=None,  gamma=None, grow\_policy=None, importance\_type=None,  interaction\_constraints=None, learning\_rate=None, max\_bin=None,  max\_cat\_threshold=None, max\_cat\_to\_onehot=None,  max\_delta\_step=None, max\_depth=3, max\_leaves=None,  min\_child\_weight=None, missing=nan, monotone\_constraints=None,  multi\_strategy=None, n\_estimators=100, n\_jobs=None,  num\_parallel\_tree=None, random\_state=None, ...) | [[223 54]  [ 32 417]] | 417 | 54 | 32 | 223 | 0.8812141992836158 | 0.8815426997245179 | 0.8805097319295364 | 9.415794134140015 |