If Complain == 0 AND Points Earned < 184 AND Satisfaction < 2.5:

return “CHURN”

If Complain == 0 AND Points Earned < 184 AND NOT Satisfaction < 2.5:

return “NOCHURN”

TP: biz gidecek dedik, gitti [true, dogru, guzel]

bu rakam KUCUK OLMALI

TN: biz kalacak dedik, kaldi [true, correct, dogru]

bu rakam BUYUK OLMALI

FP: biz gidecek dedik, kaldi

Ahmet gidecek dedik, halbuki Ahmet memnun, gitmeyecek

bosuna, extra masraf (cost = Call+promotion cost)

FN: biz kalacak dedik, gitti

en problemlisi

Ahmet, gitmiyor.... kalacak, Ahmet'i kaybettik

IPSOS

PWC

EY

KPMG

PaymentMethod\_Mailed check

Partner

0.17486866820202496

0.12096936838849857 0.11913439740443826

SeniorCitizen PaperlessBilling 0.23123188361860916 0.156342528399725 0.19246101225193787

SeniorCitizen MonthlyCharges 0.23931225067853984 0.156342528399725 0.2260790583607628

SeniorCitizen PaymentMethod\_Electronic check 0.3016558853285919 0.156342528399725 0.2909223945271484

Partner Dependents 0.16046738819147524 0.11913439740443826 0.15532864770389843

Partner OnlineSecurity 0.17597216395622337 0.11913439740443826 0.1453493608441364

Partner InternetService\_0 0.23952458337719273 0.11913439740443826 0.23438958690378123

Partner InternetService\_DSL 0.17767135524070699 0.11913439740443826 0.1331187572741122

Partner Contract\_One year 0.18473953625619313 0.11913439740443826 0.15287300440243418

Dependents Contract\_One year 0.2119418739787441 0.15532864770389843 0.15287300440243418

tenure InternetService\_0 0.3791708598613102 0.30538983029473127 0.23438958690378123

tenure Contract\_Two year 0.3344118739006521 0.30538983029473127 0.287332185207858

tenure PaymentMethod\_Mailed check 0.3212703901455619 0.30538983029473127 0.12096936838849857

PhoneService InternetService\_DSL 0.1352967695301801 0.01657385437930156 0.1331187572741122

OnlineSecurity Dependents 0.20567158326472598 0.1453493608441364 0.15532864770389843

OnlineSecurity InternetService\_0 0.32571041430103204 0.1453493608441364 0.23438958690378123

OnlineSecurity InternetService\_DSL 0.17042498331249872 0.1453493608441364 0.1331187572741122

OnlineSecurity Contract\_One year 0.20239549348642552 0.1453493608441364 0.15287300440243418

OnlineBackup DeviceProtection 0.047131024264381274 0.04556490765000591 0.03010484960524393

OnlineBackup InternetService\_0 0.23843947780665373 0.04556490765000591 0.23438958690378123

TechSupport Partner 0.17114602269467688 0.1349975502054987 0.11913439740443826

TechSupport Dependents 0.20030682644245174 0.1349975502054987 0.15532864770389843

TechSupport OnlineSecurity 0.17098586500806595 0.1349975502054987 0.1453493608441364

TechSupport InternetService\_0 0.3167666110161018 0.1349975502054987 0.23438958690378123

TechSupport InternetService\_DSL 0.1646530242104341 0.1349975502054987 0.1331187572741122

TechSupport Contract\_One year 0.19556504802121047 0.1349975502054987 0.15287300440243418

TechSupport PaymentMethod\_Bank transfer (automatic) 0.15788074346804293 0.1349975502054987 0.09610727713628012

TechSupport PaymentMethod\_Credit card (automatic) 0.1652499388397282 0.1349975502054987 0.10913361641416712

TechSupport PaymentMethod\_Mailed check 0.18776051906222954 0.1349975502054987 0.12096936838849857

StreamingTV SeniorCitizen 0.16756431366940022 0.10252335946523987 0.156342528399725

StreamingTV MultipleLines 0.11997991647193523 0.10252335946523987 0.08646836624366837

StreamingTV StreamingMovies 0.11721034034926067 0.10252335946523987 0.10234681066538687

StreamingMovies SeniorCitizen 0.16600485782778085 0.10234681066538687 0.156342528399725

StreamingMovies MultipleLines 0.1197611535817987 0.10234681066538687 0.08646836624366837

PaperlessBilling MonthlyCharges 0.24612478138138635 0.19246101225193787 0.2260790583607628

MonthlyCharges Contract\_Month-to-month 0.423947259503929 0.2260790583607628 0.38114087943301383

TotalCharges Partner 0.15477357986264983 0.14316227972450454 0.11913439740443826

TotalCharges Dependents 0.2020442776123321 0.14316227972450454 0.15532864770389843

TotalCharges OnlineSecurity 0.17035121592949212 0.14316227972450454 0.1453493608441364

TotalCharges TechSupport 0.16150236365079412 0.14316227972450454 0.1349975502054987

TotalCharges InternetService\_0 0.34428098738093976 0.14316227972450454 0.23438958690378123

TotalCharges InternetService\_DSL 0.19019755470578223 0.14316227972450454 0.1331187572741122

TotalCharges Contract\_One year 0.19415755697492107 0.14316227972450454 0.15287300440243418

TotalCharges PaymentMethod\_Bank transfer (automatic) 0.14671625155258236 0.14316227972450454 0.09610727713628012

TotalCharges PaymentMethod\_Credit card (automatic) 0.15753034349149123 0.14316227972450454 0.10913361641416712

TotalCharges PaymentMethod\_Mailed check 0.20796325494280035 0.14316227972450454 0.12096936838849857

InternetService\_0 Dependents 0.2535549269827996 0.23438958690378123 0.15532864770389843

InternetService\_0 Contract\_One year 0.26710821735331886 0.23438958690378123 0.15287300440243418

InternetService\_0 Contract\_Two year 0.33246399248542086 0.23438958690378123 0.287332185207858

InternetService\_DSL Dependents 0.1981374955300037 0.1331187572741122 0.15532864770389843

InternetService\_DSL InternetService\_0 0.31955608785295775 0.1331187572741122 0.23438958690378123

InternetService\_DSL Contract\_One year 0.19610166111967173 0.1331187572741122 0.15287300440243418

InternetService\_DSL Contract\_Two year 0.2881202275327738 0.1331187572741122 0.287332185207858

InternetService\_Fiber optic Contract\_Month-to-month 0.4392843922940992 0.31955608785295775 0.38114087943301383

Contract\_Two year Contract\_One year 0.38114087943301383 0.287332185207858 0.15287300440243418

PaymentMethod\_Bank transfer (automatic) Partner 0.14647528886396244 0.09610727713628012 0.11913439740443826

PaymentMethod\_Bank transfer (automatic) Dependents 0.17561825000628778 0.09610727713628012 0.15532864770389843

PaymentMethod\_Bank transfer (automatic) OnlineSecurity 0.16575260410087525 0.09610727713628012 0.1453493608441364

PaymentMethod\_Bank transfer (automatic) InternetService\_DSL 0.16140373709047223 0.09610727713628012 0.1331187572741122

PaymentMethod\_Bank transfer (automatic) Contract\_One year 0.17232731514543517 0.09610727713628012 0.15287300440243418

PaymentMethod\_Credit card (automatic) Partner 0.15689674456088978 0.10913361641416712 0.11913439740443826

PaymentMethod\_Credit card (automatic) Dependents 0.18351315162827364 0.10913361641416712 0.15532864770389843

PaymentMethod\_Credit card (automatic) OnlineSecurity 0.17249679413367425 0.10913361641416712 0.1453493608441364

PaymentMethod\_Credit card (automatic) InternetService\_0 0.24074795326265272 0.10913361641416712 0.23438958690378123

PaymentMethod\_Credit card (automatic) InternetService\_DSL 0.16752836022939713 0.10913361641416712 0.1331187572741122

PaymentMethod\_Credit card (automatic) Contract\_One year 0.1807965571966523 0.10913361641416712 0.15287300440243418

PaymentMethod\_Credit card (automatic) PaymentMethod\_Bank transfer (automatic) 0.17400559981449434 0.10913361641416712 0.09610727713628012

PaymentMethod\_Electronic check PaperlessBilling 0.30981143210054934 0.2909223945271484 0.19246101225193787

PaymentMethod\_Electronic check MonthlyCharges 0.3285475406380719 0.2909223945271484 0.2260790583607628

PaymentMethod\_Electronic check InternetService\_Fiber optic 0.3746883001912573 0.2909223945271484 0.31955608785295775

PaymentMethod\_Electronic check Contract\_Month-to-month 0.41293380421177245 0.2909223945271484 0.38114087943301383

PaymentMethod\_Mailed check Partner 0.17486866820202496 0.12096936838849857 0.11913439740443826

PaymentMethod\_Mailed check Dependents 0.18969795143630275 0.12096936838849857 0.15532864770389843

PaymentMethod\_Mailed check OnlineSecurity 0.19540063708248398 0.12096936838849857 0.1453493608441364

PaymentMethod\_Mailed check OnlineBackup 0.12286748412808549 0.12096936838849857 0.04556490765000591

PaymentMethod\_Mailed check InternetService\_DSL 0.17581827365520497 0.12096936838849857 0.1331187572741122

PaymentMethod\_Mailed check Contract\_One year 0.19181869272585447 0.12096936838849857 0.15287300440243418

PaymentMethod\_Mailed check Contract\_Two year 0.2905391630822113 0.12096936838849857 0.287332185207858

PaymentMethod\_Mailed check PaymentMethod\_Bank transfer (automatic) 0.18109023839393693 0.12096936838849857 0.09610727713628012

PaymentMethod\_Mailed check PaymentMethod\_Credit card (automatic) 0.19197869353991595 0.12096936838849857 0.10913361641416712

tenure\_log Dependents 0.32763867732876256 0.30869609880701643 0.15532864770389843

tenure\_log tenure 0.31367549682888907 0.30869609880701643 0.30538983029473127

tenure\_log OnlineSecurity 0.31344978419438047 0.30869609880701643 0.1453493608441364

tenure\_log TechSupport 0.31021622962111345 0.30869609880701643 0.1349975502054987

tenure\_log InternetService\_0 0.3710404774204059 0.30869609880701643 0.23438958690378123

tenure\_log InternetService\_DSL 0.3351006321111504 0.30869609880701643 0.1331187572741122

tenure\_log Contract\_One year 0.32118985250016746 0.30869609880701643 0.15287300440243418

tenure\_log Contract\_Two year 0.34471474757708187 0.30869609880701643 0.287332185207858

tenure\_log PaymentMethod\_Credit card (automatic) 0.30943657278923825 0.30869609880701643 0.10913361641416712

tenure\_log PaymentMethod\_Mailed check 0.353052317736194 0.30869609880701643 0.12096936838849857

tenure\_sqrt InternetService\_0 0.37332936575844927 0.31428848693247113 0.23438958690378123

tenure\_sqrt Contract\_Two year 0.3400770072043684 0.31428848693247113 0.287332185207858

tenure\_pow2 InternetService\_0 0.36654275524751684 0.2826803436521098 0.23438958690378123

tenure\_pow2 Contract\_One year 0.28461618394243376 0.2826803436521098 0.15287300440243418

tenure\_pow2 Contract\_Two year 0.3198288038643342 0.2826803436521098 0.287332185207858

tenure\_pow2 PaymentMethod\_Mailed check 0.30778544484197407 0.2826803436521098 0.12096936838849857

tenure\_pow2 tenure\_log 0.31520377948905826 0.2826803436521098 0.30869609880701643

tenure\_pow13 InternetService\_0 0.37616502001173063 0.29832687858310813 0.23438958690378123

tenure\_pow13 Contract\_Two year 0.3296119607964221 0.29832687858310813 0.287332185207858

tenure\_pow13 PaymentMethod\_Mailed check 0.318956869919468 0.29832687858310813 0.12096936838849857

tenure\_pow13 tenure\_log 0.31436595246231497 0.29832687858310813 0.30869609880701643

tenure\_pow06 InternetService\_0 0.37691381794041884 0.3131467564882657 0.23438958690378123

tenure\_pow06 Contract\_Two year 0.3396670012933304 0.3131467564882657 0.287332185207858

tenure\_pow06 PaymentMethod\_Mailed check 0.31328381059865945 0.3131467564882657 0.12096936838849857

tenure\_med Dependents 0.27816445644241783 0.25705067402839216 0.15532864770389843

tenure\_med OnlineSecurity 0.25717430635634964 0.25705067402839216 0.1453493608441364

tenure\_med InternetService\_0 0.35075240542272446 0.25705067402839216 0.23438958690378123

tenure\_med InternetService\_DSL 0.27599932506006464 0.25705067402839216 0.1331187572741122

tenure\_med Contract\_One year 0.2726074988395844 0.25705067402839216 0.15287300440243418

tenure\_med Contract\_Two year 0.31838623014659073 0.25705067402839216 0.287332185207858

tenure\_med PaymentMethod\_Mailed check 0.30351372370930485 0.25705067402839216 0.12096936838849857

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IMBALANCED DATASET

0.03

0.04556490765000591

0.06

4.8

0.98

0.88