Input vocabulary : initial (binary) predicates on which facts are built

age, nbDependentChildren, yearlyIncome, currentAccount, savingsAccount, debtLevel, healthStatus, workStatus, loanPurpose, loanAmount, loanDuration, personalContribution, loanFile

Input set of facts

age(p1, 35) , nbDependentChildren(p1, 2) , yearlyIncome(p1, 60000), currentAccount(p1, 10000) , savingsAccount(p1, 30000), debtLevel(p1, low), healthStatus(p1, good), workStatus(p1,cdi), loanPurpose(p1, propertypurchase), loanAmount(p1, 400000), loanDuration(p1, 120), personalContribution(p1, 100000), loanFile(p1, complete),

age(p2, 30) , nbDepedentChildren(p2, 0) , yearlyIncome(p2, 40000), currentAccount(p2, 10000) , savingsAccount(p2 , 5000), debtLevel(p2, low), healthStatus(p2, good), workStatus(p2,cdd), loanPurpose(p2, propertypurchase), loanAmount(p2, 200000), loanDuration(p2, 120), personalContribution(p2, 10000), loanFile(p2, correct)

Datalog rules

Abstraction rules

R1 : ageRange(X,young) <= age(X,Y) & Y < 30
R2 : ageRange(X,medium) <= age(X,Y) & Y >= 30 & Y < 50
R3 : ageRange(X,senior) <= age(X,Y) & Y >= 50

R4 : incomeRange(X, high) <= yearlyIncome(X,Y) & Y > 60000
R5 : incomeRange(X, medium) <= yearlyIncome(X,Y) & Y > 30000 & Y <= 60000
R6 : incomeRange(X, low) <= yearlyIncome(X,Y) & Y <= 30000

R7 : durationRange(X , short) <= loanDuration(X,Y) & Y <= 36
R8 : durationRange(X , medium) <= loanDuration(X,Y) & Y > 36 & Y <= 60
R9 : durationRange(X , long) <= loanDuration(X,Y) & Y > 60

R10 : contributionRange(X,weak) <= personalContribution(X,Y) & Y < 10000
R11 : contributionRange(X,medium) <= personalContribution(X,Y)
& Y >= 10000 & Y < 40000
R12 : contributionRange(X,high) <= personalContribution(X,Y) & Y >= 40000

R13 : amountRange(X,low) <= loanAmount(X, Y) & Y < 20000
R14 : amountRange(X,medium) <= loanAmount(X, Y) & Y >= 20000 & Y < 100000
R15 : amountRange(X,high) <= loanAmount(X, Y) & Y >= 100000

R16 : hasRegularSalary(X) <= workStatus(X,cdi)
R17 : hasSalary(X) <= workStatus(X,cdd)
R18 : hasSalary(X) <= hasRegularSalary(X)

R19 : savings(X,bad) <= currentAccount(X,Y) & savingsAccount (X,Z) & (Z/Y < 2)
R20 : savings(X,good) <= currentAccount(X,Y) & savingsAccount (X,Z) & (Z/Y >= 2

Rules defining new predicates

R21 : financialSituation(X,good) <= hasSalary(X) & incomeRange(X, high)
R22 : financialSituation(X,good) <= hasRegularSalary(X) & incomeRange(X, medium)
R23 : inancialSituation(X,good) <= contributionRange(X,high) & amountRange(X,low)
R24 : financialSituation(X,good) <= contributionRange(X,medium) & savings(X,good)

R25 : risk(X,weak) <= durationRange(X , medium) & debtLevel(X,moderate)
& hasRegularSalary(X)
R26 : risk(X, moderate) <= durationRange(X , medium) & debtLevel(X,high)
& hasRegularSalary(X)
R27 : risk(X,reasonable) <= risk(X,moderate)
R28 : risk(X,reasonable) <= risk(X,weak)

R29 : loanQuality(X,good) <= loanPurpose(X,consumption) & loanFile(X,complete)
R30 : loanQuality(X,good) <= loanPurpose(X,consumption) & loanFile(X,correct)
R31 : loanQuality(X,good) <= loanPurpose(X,propertypurchase) & loanFile(X,complete)
R32 : loanQuality(X,middle) <= loanPurpose(X,other) & loanFile(X,complete)
R33 : loanQuality(X,middle) <= loanPurpose(X,propertypurchase) & loanFile(X,correct)

R34 : situation(X, favourable) <= ageRange(X,young) & workStatus(X,cdi)
R35 : situation(X, favourable) <= ageRange(X,medium) & workStatus(X,cdi)
& healthStatus(X,good)
R36 : situation(X, favourable) <= ageRange(X,senior) & healthStatus(X,good)
& nbDependentChildren(X,0)

Decision rules

R37 : decision(X,yes) <= financialSituation(X,good) & loanQuality(X,good)
R38 : decision(X,yes) <= financialSituation(X,good) & not(loanQuality(X,good))
& risk(X, reasonable)
R39 : decision(X,yes) <= financialSituation(X,good) & not(loanQuality(X,good))
& not(risk(X, reasonable)) & situation(X,favourable)
R40 : decision(X,yes) <= risk(X,weak) & savings(X,good) & loanQuality(X,good)
R41 : decision(X,yes) <= risk(X,weak) & savings(X,good) & loanQuality(X,middle)
R42 : decision(X,no) <= risk(X,weak) & savings(X,good) & not(loanQuality(X,Y))
R43 : decision(X,no) <= financialSituation(X,good) & not(loanQuality(X,good))
& not(risk(X, reasonable)) & not(situation(X,favourable))
R44 : decision(X,no) <= savings(X,bad) & not(financialSituation(X,good))
& loanQuality(X,middle)
R45 : decision(X,no) <= savings(X,bad) & not(financialSituation(X,good))
& risk(X,moderate)