Ontology (CS6852)
Assignment 3

Team: G10

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Domain: Banking

Description:

Our Ontology design will represent the Banking domain. We will design the ontology of one branch of a bank.The bank domain will have the classes - Employee, Customer,Machines, Loan, Borrower, Utilization, Account, Technician ,Manager.
Object properties like overseas and worksUnder will be used to represent transitivity. Each account can belong to one or a specified maximum number of customers which will be represented using number restrictions and qualified number restrictions/cardinality restrictions.

Object Properties:

1. processes: { Person, (Redressal ⊔ Payment ⊔ Transaction ⊔ Money) }
2. answersQuery: { CustomerCare, Customer }
3. asksQuery: { Customer, CustomerCare }
4. belongsTo: { Account, Customer }
5. borrows: { Borrower, Loan }
6. deposits: { Depositor, Deposit }
7. hasPaymentAmount: { Payment, Cash }
8. havingPayment: { PaymentNumber, Payment }
9. maintains: { Person, (FinancialService ⊔ Machine) }
10. manages: { Manager, Branch }
11. offers: { Branch, (GoldStorage ⊔ Loan) }
12. oversees: { Manager, Employee }
13. owns: { Customer, Account }
14. withdraws: { Customer, Withdrawal }
15. worksAt: { Employee, Branch }

16. workUnder: { Employee, Manager }

Updated T-Box:

Person

1. Customer ⊑ Person ⊓ ∀ asksQuery.CustomerCare ⊓
   (∃ owns.Account ⊔ ∃ withdraws.Withdrawal)
2. Depositor ⊑ Customer ⊓ ∃ deposits.Deposit
3. Borrower ⊑ Customer ⊓ ∃ borrows.Loan
4. Employee ⊑ Person ⊓ ∀ worksAt.Branch ⊓ ∀ worksUnder.Manager
5. Cashier ⊑ Employee ⊓ ∃ maintains.FinancialService ⊓
   ∃ processes.(Payment ⊔ Transaction)
6. Teller ⊑ Employee ⊓ ∃ processes.(Cheque)
7. Security ⊑ Employee
8. CustomerCare ⊑ Employee ⊓ ∀ answersQuery.Customer
9. Technician ⊑ Employee ⊓ ∃ maintains.Machine
10. Manager ⊑ Person ⊓ ∃ manages.Branch ⊓ ∃ oversees.Employee ⊓
    ∃ processes.Redressal

Place

1. GoldStorage ⊑ Place
2. Branch ⊑ Place ⊓ (∃ offers.GoldStorage ⊔ ∃ offers.Loan

Money

1. Cash ⊑ Money
2. Cheque ⊑ Money

FinancialService

1. Deposit ⊑ FinancialService ⊓ (Cash ⊔ Cheque)
2. Withdrawal ⊑ FinancialService
3. Payment ⊑ FinancialService ⊓ (
   ≥ 1 hasPaymentAmount.Cash ⊓
   ≤ 1 hasPaymentAmount.Cash)
4. PaymentNumber ⊑ FinancialService ⊓ (
   ≥ 1 havingPayment.Payment ⊓
   ≤ 1 havingPayment.Payment)
5. Transaction ⊑ FinancialService ⊓ (Deposit ⊔ Withdrawal)

Machine

1. ATM ⊑ Machine
2. CashDepositMachine ⊑ Machine

3. ChequeDepositMachine $\sqsubseteq$ Machine
4. PassbookPrinter $\sqsubseteq$ Machine

Other

1. Redressal $\sqsubseteq$ Other
2. Account $\sqsubseteq$ Other $\sqcap$ $\neg$Person $\sqcap$ $\exists$ belongsTo.Customer
3. FixedDepositAccount $\sqsubseteq$ Account
4. CurrentAccount $\sqsubseteq$ Account
5. LoanAccount $\sqsubseteq$ Account
6. SavingsAccount $\sqsubseteq$ Account