

Insurance Agency Policy Tracking Database System

Phase 3 – Prototype Implementation

Gabelli School of Business

Fordham University

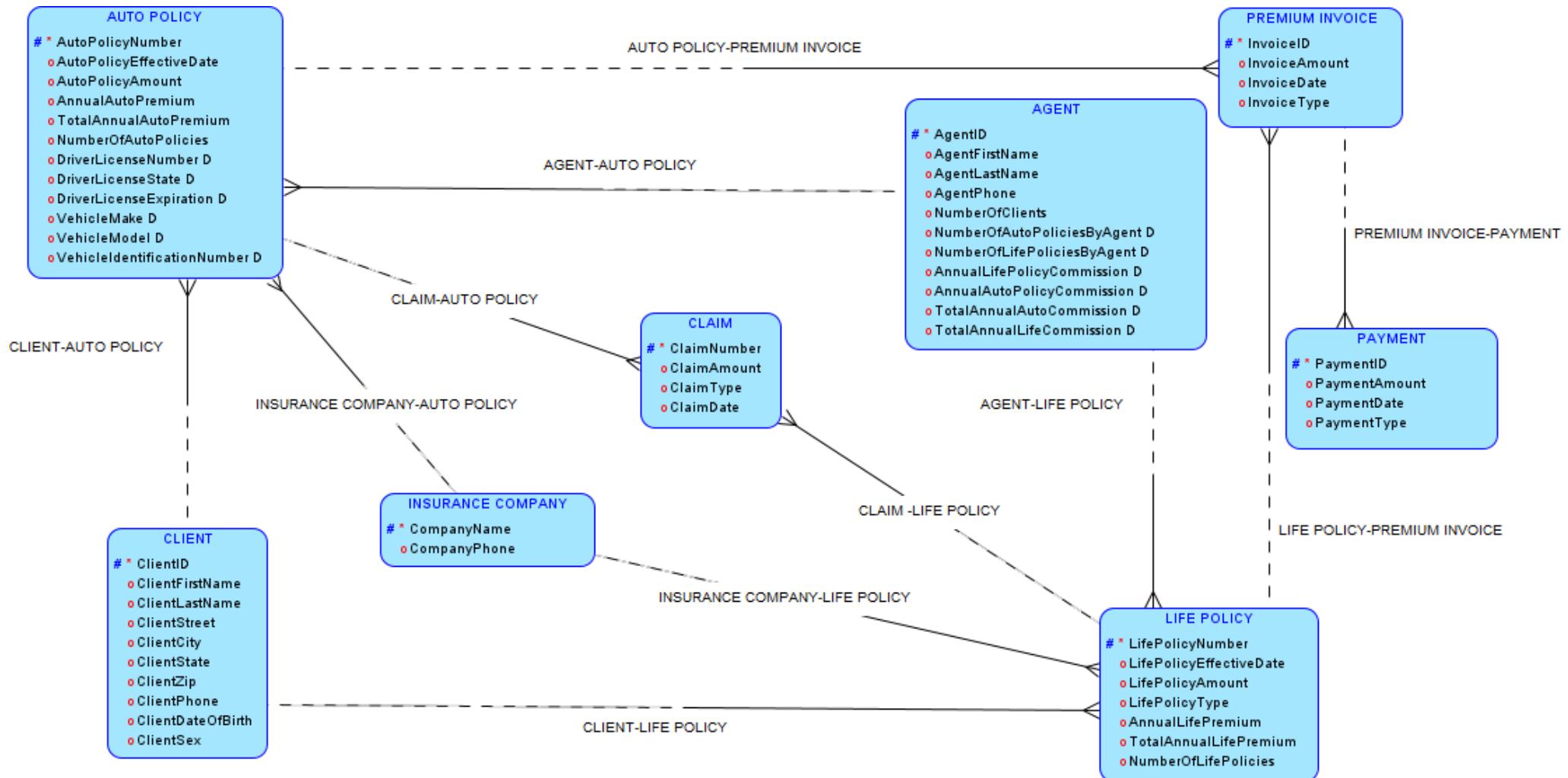
Data Management and SQL (BYGB-7973-003) – Fall 2025

Prof. RP Raghupathi

Team Black Widow: MQ, JP, and Sofia Williner

10 December 2025

Logical Model for Insurance Agency Policy Tracking Database System



Logical Model Assumptions for Insurance Agency Policy Tracking Database System

1. DriverLicenseNumber D, DriverLicenseState D, and DriverLicenseExpiration D attributes in AUTO POLICY entity describe the CLIENT-AUTO POLICY relationship
2. VehicleMake D, VehicleModel D, and VehicleIdentificationNumber D attributes in AUTO POLICY entity describe the CLIENT-AUTO POLICY relationship
3. NumberOfAutoPoliciesByAgent D, AnnualAutoPolicyCommission D, and TotalAnnualAutoCommission D attributes in AGENT entity describe the AGENT-AUTO POLICY relationship
4. NumberOfLifePoliciesByAgent D, AnnualLifePolicyCommission D, and TotalAnnualLifeCommission D attributes in AGENT entity describe the AGENT-LIFE POLICY relationship
5. LifePolicyType attribute in LIFE POLICY entity refers to either term, whole life, limited-payment life, endowment, or combination plans
6. NumberOfAutoPoliciesByAgent D and NumberOfLifePoliciesByAgent D attributes in AGENT entity refer to policies sold by agent

Logical Model Data Dictionary for Insurance Agency Policy Tracking Database System

Entity Name	AGENT
-------------	-------

Attributes

No	Attribute Name	PK	FK	M	Data Type
1	AgentID	P		Y	NUMERIC (5)
2	AgentFirstName				CHAR (20 CHAR)
3	AgentLastName				CHAR (20 CHAR)
4	AgentPhone				CHAR (12 CHAR)
5	NumberOfClients				Integer
6	NumberOfAutoPoliciesByAgent D				Integer
7	NumberOfLifePoliciesByAgent D				Integer
8	AnnualLifePolicyCommission D				MONEY
9	AnnualAutoPolicyCommission D				MONEY
10	TotalAnnualAutoCommission D				MONEY
11	TotalAnnualLifeCommission D				MONEY

Continued.



Logical Model Data Dictionary for Insurance Agency Policy Tracking Database System (cont.)

Entity Name	AUTO POLICY
-------------	-------------

Attributes

No	Attribute Name	PK	FK	M	Data Type
1	AutoPolicyNumber	P		Y	NUMERIC (5)
2	AutoPolicyEffectiveDate				Date
3	AutoPolicyAmount				MONEY
4	AnnualAutoPremium				MONEY
5	TotalAnnualAutoPremium				MONEY
6	NumberOfAutoPolicies				Integer
7	DriverLicenseNumber D				CHAR (12 CHAR)
8	DriverLicenseState D				CHAR (2 CHAR)
9	DriverLicenseExpiration D				Date
10	VehicleMake D				CHAR (15 CHAR)
11	VehicleModel D				CHAR (20 CHAR)
12	VehicleIdentificationNumber D				CHAR (17 CHAR)
13	DriverLicenseState D				CHAR (2 CHAR)
14	AgentID		F	Y	NUMERIC (5)
15	ClientID		F	Y	NUMERIC (5)
15	CompanyName		F	Y	CHAR (20 CHAR)

Entity Name	CLAIM
-------------	-------

Attributes

No	Attribute Name	PK	FK	M	Data Type
1	ClaimNumber	P		Y	NUMERIC (4)
2	ClaimAmount				MONEY
3	ClaimType				CHAR (4 CHAR)
4	ClaimDate				Date
5	AutoPolicyNumber		F	Y	NUMERIC (5)
6	LifePolicyNumber		F	Y	NUMERIC (5)

Logical Model Data Dictionary for Insurance Agency Policy Tracking Database System (cont.)

Entity Name	CLIENT
--------------------	--------

Attributes

No	Attribute Name	PK	FK	M	Data Type
1	ClientID	P		Y	NUMERIC (5)
2	ClientFirstName				CHAR (20 CHAR)
3	ClientLastName				CHAR (20 CHAR)
4	ClientStreet				CHAR (20 CHAR)
5	ClientCity				CHAR (20 CHAR)
6	ClientState				CHAR (2 CHAR)
7	ClientZip				NUMERIC (5)
8	ClientPhone				CHAR (12 CHAR)
9	ClientDateOfBirth				Date
10	ClientSex				CHAR (1 CHAR)

Entity Name	INSURANCE COMPANY
--------------------	-------------------

Attributes

No	Attribute Name	PK	FK	M	Data Type
1	CompanyName	P		Y	CHAR (20 CHAR)
2	CompanyPhone				CHAR (12 CHAR)

Logical Model Data Dictionary for Insurance Agency Policy Tracking Database System (cont.)

Entity Name	LIFE POLICY
--------------------	-------------

Attributes

No	Attribute Name	PK	FK	M	Data Type
1	LifePolicyNumber	P		Y	NUMERIC (5)
2	LifePolicyEffectiveDate				Date
3	LifePolicyAmount				MONEY
4	LifePolicyType				CHAR (20 CHAR)
5	AnnualLifePremium				MONEY
6	TotalAnnualLifePremium				MONEY
7	NumberOfLifePolicies				Integer
8	ClientID		F	Y	NUMERIC (5)
9	AgentID		F	Y	NUMERIC (5)
10	CompanyName		F	Y	CHAR (20 CHAR)

Entity Name	PAYMENT
--------------------	---------

Attributes

No	Attribute Name	PK	FK	M	Data Type
1	PaymentID	P		Y	NUMERIC (5)
2	PaymentAmount				MONEY
3	PaymentDate				Date
4	PaymentType				CHAR (4 CHAR)
5	InvoiceID		F	Y	NUMERIC (5)

Logical Model Data Dictionary for Insurance Agency Policy Tracking Database System (cont.)

Entity Name	PREMIUM INVOICE
--------------------	-----------------

Attributes

No	Attribute Name	PK	FK	M	Data Type
1	InvoiceID	P		Y	NUMERIC (5)
2	InvoiceAmount				MONEY
3	InvoiceDate				Date
4	InvoiceType				CHAR (4 CHAR)
5	AutoPolicyNumber		F	Y	NUMERIC (5)
6	LifePolicyNumber		F	Y	NUMERIC (5)

Default Relational Model for Insurance Agency Policy Tracking Database System

LIFE_POLICY	
P * LifePolicyNumber	NUMBER (5)
LifePolicyEffectiveDate	DATE
LifePolicyAmount	NUMBER
LifePolicyType	CHAR (20 CHAR)
AnnualLifePremium	NUMBER
TotalAnnualLifePremium	NUMBER
NumberOfLifePolicies	INTEGER
F * CLIENT_ClientID	NUMBER (5)
F * AGENT_AgentID	NUMBER (5)
F * INSURANCE_COMPANY_CompanyName	CHAR (20 CHAR)
↳ LIFE_POLICY_PK (LifePolicyNumber)	
↳ LIFE_POLICY_AGENT_FK (AGENT_AgentID)	
↳ LIFE_POLICY_CLIENT_FK (CLIENT_ClientID)	
↳ LIFE_POLICY_INSURANCE_COMPANY_FK (INSURANCE_COMPANY_CompanyName)	

AUTO_POLICY	
P * AutoPolicyNumber	NUMBER (5)
AutoPolicyEffectiveDate	DATE
AutoPolicyAmount	NUMBER
AnnualAutoPremium	NUMBER
TotalAnnualAutoPremium	NUMBER
NumberOfAutoPolicies	INTEGER
DriverLicenseNumber_D	CHAR (12 CHAR)
DriverLicenseState_D	CHAR (2 CHAR)
DriverLicenseExpiration_D	DATE
VehicleMake_D	CHAR (15 CHAR)
VehicleModel_D	CHAR (20 CHAR)
VehicleIdentificationNumber_D	CHAR (17 CHAR)
F * AGENT_AgentID	NUMBER (5)
F * CLIENT_ClientID	NUMBER (5)
F * INSURANCE_COMPANY_CompanyName	CHAR (20 CHAR)
↳ AUTO_POLICY_PK (AutoPolicyNumber)	
↳ AUTO_POLICY_AGENT_FK (AGENT_AgentID)	
↳ AUTO_POLICY_CLIENT_FK (CLIENT_ClientID)	
↳ AUTO_POLICY_INSURANCE_COMPANY_FK (INSURANCE_COMPANY_CompanyName)	

PAYMENT	
P * PaymentID	NUMBER (5)
PaymentAmount	NUMBER
PaymentDate	DATE
PaymentType	CHAR (4 CHAR)
F * PREMIUM_INVOICE_InvoiceID	NUMBER (5)
↳ PAYMENT_PK (PaymentID)	
↳ PAYMENT_PREMIUM_INVOICE_FK (PREMIUM_INVOICE_InvoiceID)	

PREMIUM_INVOICE	
P * InvoiceID	NUMBER (5)
InvoiceAmount	NUMBER
InvoiceDate	DATE
InvoiceType	CHAR (4 CHAR)
F * AUTO_POLICY_AutoPolicyNumber	NUMBER (5)
F * LIFE_POLICY_LifePolicyNumber	NUMBER (5)
↳ PREMIUM_INVOICE_PK (InvoiceID)	
↳ PREMIUM_INVOICE_AUTO_POLICY_FK (AUTO_POLICY_AutoPolicyNumber)	
↳ PREMIUM_INVOICE_LIFE_POLICY_FK (LIFE_POLICY_LifePolicyNumber)	

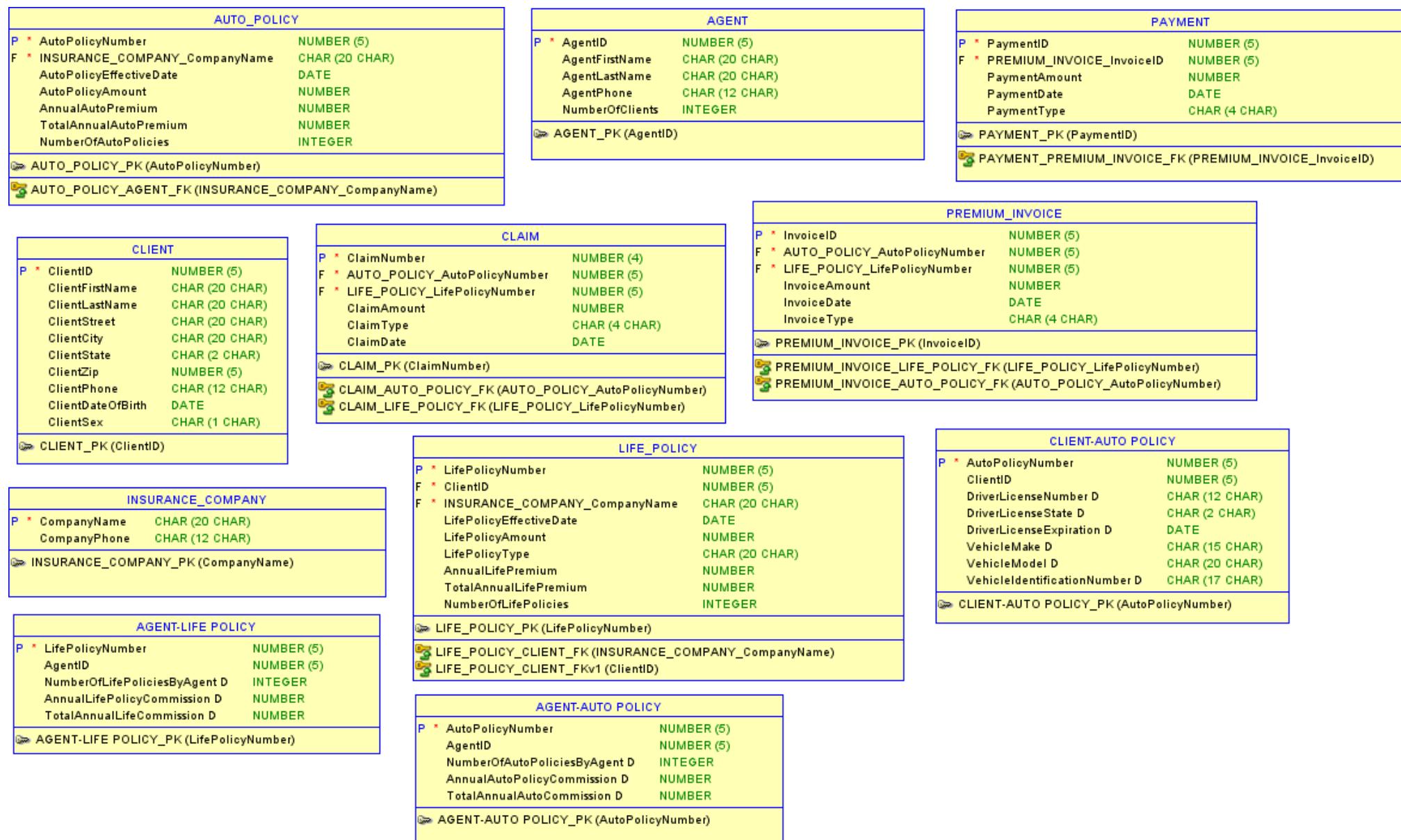
CLAIM	
P * ClaimNumber	NUMBER (4)
ClaimAmount	NUMBER
ClaimType	CHAR (4 CHAR)
ClaimDate	DATE
F * AUTO_POLICY_AutoPolicyNumber	NUMBER (5)
F * LIFE_POLICY_LifePolicyNumber	NUMBER (5)
↳ CLAIM_PK (ClaimNumber)	
↳ CLAIM_AUTO_POLICY_FK (AUTO_POLICY_AutoPolicyNumber)	
↳ CLAIM_LIFE_POLICY_FK (LIFE_POLICY_LifePolicyNumber)	

AGENT	
P * AgentID	NUMBER (5)
AgentFirstName	CHAR (20 CHAR)
AgentLastName	CHAR (20 CHAR)
AgentPhone	CHAR (12 CHAR)
NumberOfClients	INTEGER
NumberOfAutoPoliciesByAgent_D	INTEGER
NumberOfLifePoliciesByAgent_D	INTEGER
AnnualLifePolicyCommission_D	NUMBER
AnnualAutoPolicyCommission_D	NUMBER
TotalAnnualAutoCommission_D	NUMBER
TotalAnnualLifeCommission_D	NUMBER
↳ AGENT_PK (AgentID)	

CLIENT	
P * ClientID	NUMBER (5)
ClientFirstName	CHAR (20 CHAR)
ClientLastName	CHAR (20 CHAR)
ClientStreet	CHAR (20 CHAR)
ClientCity	CHAR (20 CHAR)
ClientState	CHAR (2 CHAR)
ClientZip	NUMBER (5)
ClientPhone	CHAR (12 CHAR)
ClientDateOfBirth	DATE
ClientSex	CHAR (1 CHAR)
↳ CLIENT_PK (ClientID)	

INSURANCE_COMPANY	
P * CompanyName	CHAR (20 CHAR)
CompanyPhone	CHAR (12 CHAR)
↳ INSURANCE_COMPANY_PK (CompanyName)	

Revised Relational Model for Insurance Agency Policy Tracking Database System



Normalized Relational Model for Insurance Agency Policy Tracking Database System

<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #ffffcc; text-align: left;">AUTO_POLICY</th></tr> </thead> <tbody> <tr> <td>P * AutoPolicyNumber NUMBER (5)</td></tr> <tr> <td>F * INSURANCE_COMPANY_CompanyName CHAR (20 CHAR)</td></tr> <tr> <td>AutoPolicyEffectiveDate DATE</td></tr> <tr> <td>AutoPolicyAmount NUMBER</td></tr> <tr> <td>AnnualAutoPremium NUMBER</td></tr> <tr> <td> AUTO_POLICY_PK (AutoPolicyNumber)</td></tr> <tr> <td> AUTO_POLICY_AGENT_FK (INSURANCE_COMPANY_CompanyName)</td></tr> </tbody> </table>	AUTO_POLICY	P * AutoPolicyNumber NUMBER (5)	F * INSURANCE_COMPANY_CompanyName CHAR (20 CHAR)	AutoPolicyEffectiveDate DATE	AutoPolicyAmount NUMBER	AnnualAutoPremium NUMBER	AUTO_POLICY_PK (AutoPolicyNumber)	AUTO_POLICY_AGENT_FK (INSURANCE_COMPANY_CompanyName)	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #ffffcc; text-align: left;">AGENT</th></tr> </thead> <tbody> <tr> <td>P * AgentID NUMBER (5)</td></tr> <tr> <td>AgentFirstName CHAR (20 CHAR)</td></tr> <tr> <td>AgentLastName CHAR (20 CHAR)</td></tr> <tr> <td>AgentPhone CHAR (12 CHAR)</td></tr> <tr> <td> AGENT_PK (AgentID)</td></tr> </tbody> </table>	AGENT	P * AgentID NUMBER (5)	AgentFirstName CHAR (20 CHAR)	AgentLastName CHAR (20 CHAR)	AgentPhone CHAR (12 CHAR)	AGENT_PK (AgentID)	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #ffffcc; text-align: left;">PAYMENT</th></tr> </thead> <tbody> <tr> <td>P * PaymentID NUMBER (5)</td></tr> <tr> <td>F * PREMIUM_INVOICE_InvoiceID NUMBER (5)</td></tr> <tr> <td>PaymentAmount NUMBER</td></tr> <tr> <td>PaymentDate DATE</td></tr> <tr> <td>PaymentType CHAR (4 CHAR)</td></tr> <tr> <td> PAYMENT_PK (PaymentID)</td></tr> <tr> <td> PAYMENT_PREMIUM_INVOICE_FK (PREMIUM_INVOICE_InvoiceID)</td></tr> </tbody> </table>	PAYMENT	P * PaymentID NUMBER (5)	F * PREMIUM_INVOICE_InvoiceID NUMBER (5)	PaymentAmount NUMBER	PaymentDate DATE	PaymentType CHAR (4 CHAR)	PAYMENT_PK (PaymentID)	PAYMENT_PREMIUM_INVOICE_FK (PREMIUM_INVOICE_InvoiceID)										
AUTO_POLICY																																		
P * AutoPolicyNumber NUMBER (5)																																		
F * INSURANCE_COMPANY_CompanyName CHAR (20 CHAR)																																		
AutoPolicyEffectiveDate DATE																																		
AutoPolicyAmount NUMBER																																		
AnnualAutoPremium NUMBER																																		
AUTO_POLICY_PK (AutoPolicyNumber)																																		
AUTO_POLICY_AGENT_FK (INSURANCE_COMPANY_CompanyName)																																		
AGENT																																		
P * AgentID NUMBER (5)																																		
AgentFirstName CHAR (20 CHAR)																																		
AgentLastName CHAR (20 CHAR)																																		
AgentPhone CHAR (12 CHAR)																																		
AGENT_PK (AgentID)																																		
PAYMENT																																		
P * PaymentID NUMBER (5)																																		
F * PREMIUM_INVOICE_InvoiceID NUMBER (5)																																		
PaymentAmount NUMBER																																		
PaymentDate DATE																																		
PaymentType CHAR (4 CHAR)																																		
PAYMENT_PK (PaymentID)																																		
PAYMENT_PREMIUM_INVOICE_FK (PREMIUM_INVOICE_InvoiceID)																																		
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #ffffcc; text-align: left;">CLIENT</th></tr> </thead> <tbody> <tr> <td>P * ClientID NUMBER (5)</td></tr> <tr> <td>ClientFirstName CHAR (20 CHAR)</td></tr> <tr> <td>ClientLastName CHAR (20 CHAR)</td></tr> <tr> <td>ClientStreet CHAR (20 CHAR)</td></tr> <tr> <td>ClientCity CHAR (20 CHAR)</td></tr> <tr> <td>ClientState CHAR (2 CHAR)</td></tr> <tr> <td>ClientZip NUMBER (5)</td></tr> <tr> <td>ClientPhone CHAR (12 CHAR)</td></tr> <tr> <td>ClientDateOfBirth DATE</td></tr> <tr> <td>ClientSex CHAR (1 CHAR)</td></tr> <tr> <td> CLIENT_PK (ClientID)</td></tr> </tbody> </table>	CLIENT	P * ClientID NUMBER (5)	ClientFirstName CHAR (20 CHAR)	ClientLastName CHAR (20 CHAR)	ClientStreet CHAR (20 CHAR)	ClientCity CHAR (20 CHAR)	ClientState CHAR (2 CHAR)	ClientZip NUMBER (5)	ClientPhone CHAR (12 CHAR)	ClientDateOfBirth DATE	ClientSex CHAR (1 CHAR)	CLIENT_PK (ClientID)	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #ffffcc; text-align: left;">CLAIM</th></tr> </thead> <tbody> <tr> <td>P * ClaimNumber NUMBER (4)</td></tr> <tr> <td>F * AUTO_POLICY_AutoPolicyNumber NUMBER (5)</td></tr> <tr> <td>F * LIFE_POLICY_LifePolicyNumber NUMBER (5)</td></tr> <tr> <td>ClaimAmount NUMBER</td></tr> <tr> <td>ClaimType CHAR (4 CHAR)</td></tr> <tr> <td>ClaimDate DATE</td></tr> <tr> <td> CLAIM_PK (ClaimNumber)</td></tr> <tr> <td> CLAIM_LIFE_POLICY_FK (LIFE_POLICY_LifePolicyNumber)</td></tr> <tr> <td> CLAIM_AUTO_POLICY_FK (AUTO_POLICY_AutoPolicyNumber)</td></tr> </tbody> </table>	CLAIM	P * ClaimNumber NUMBER (4)	F * AUTO_POLICY_AutoPolicyNumber NUMBER (5)	F * LIFE_POLICY_LifePolicyNumber NUMBER (5)	ClaimAmount NUMBER	ClaimType CHAR (4 CHAR)	ClaimDate DATE	CLAIM_PK (ClaimNumber)	CLAIM_LIFE_POLICY_FK (LIFE_POLICY_LifePolicyNumber)	CLAIM_AUTO_POLICY_FK (AUTO_POLICY_AutoPolicyNumber)	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #ffffcc; text-align: left;">PREMIUM_INVOICE</th></tr> </thead> <tbody> <tr> <td>P * InvoiceID NUMBER (5)</td></tr> <tr> <td>F * AUTO_POLICY_AutoPolicyNumber NUMBER (5)</td></tr> <tr> <td>F * LIFE_POLICY_LifePolicyNumber NUMBER (5)</td></tr> <tr> <td>InvoiceAmount NUMBER</td></tr> <tr> <td>InvoiceDate DATE</td></tr> <tr> <td>InvoiceType CHAR (4 CHAR)</td></tr> <tr> <td> PREMIUM_INVOICE_PK (InvoiceID)</td></tr> <tr> <td> PREMIUM_INVOICE_LIFE_POLICY_FK (LIFE_POLICY_LifePolicyNumber)</td></tr> <tr> <td> PREMIUM_INVOICE_AUTO_POLICY_FK (AUTO_POLICY_AutoPolicyNumber)</td></tr> </tbody> </table>	PREMIUM_INVOICE	P * InvoiceID NUMBER (5)	F * AUTO_POLICY_AutoPolicyNumber NUMBER (5)	F * LIFE_POLICY_LifePolicyNumber NUMBER (5)	InvoiceAmount NUMBER	InvoiceDate DATE	InvoiceType CHAR (4 CHAR)	PREMIUM_INVOICE_PK (InvoiceID)	PREMIUM_INVOICE_LIFE_POLICY_FK (LIFE_POLICY_LifePolicyNumber)	PREMIUM_INVOICE_AUTO_POLICY_FK (AUTO_POLICY_AutoPolicyNumber)
CLIENT																																		
P * ClientID NUMBER (5)																																		
ClientFirstName CHAR (20 CHAR)																																		
ClientLastName CHAR (20 CHAR)																																		
ClientStreet CHAR (20 CHAR)																																		
ClientCity CHAR (20 CHAR)																																		
ClientState CHAR (2 CHAR)																																		
ClientZip NUMBER (5)																																		
ClientPhone CHAR (12 CHAR)																																		
ClientDateOfBirth DATE																																		
ClientSex CHAR (1 CHAR)																																		
CLIENT_PK (ClientID)																																		
CLAIM																																		
P * ClaimNumber NUMBER (4)																																		
F * AUTO_POLICY_AutoPolicyNumber NUMBER (5)																																		
F * LIFE_POLICY_LifePolicyNumber NUMBER (5)																																		
ClaimAmount NUMBER																																		
ClaimType CHAR (4 CHAR)																																		
ClaimDate DATE																																		
CLAIM_PK (ClaimNumber)																																		
CLAIM_LIFE_POLICY_FK (LIFE_POLICY_LifePolicyNumber)																																		
CLAIM_AUTO_POLICY_FK (AUTO_POLICY_AutoPolicyNumber)																																		
PREMIUM_INVOICE																																		
P * InvoiceID NUMBER (5)																																		
F * AUTO_POLICY_AutoPolicyNumber NUMBER (5)																																		
F * LIFE_POLICY_LifePolicyNumber NUMBER (5)																																		
InvoiceAmount NUMBER																																		
InvoiceDate DATE																																		
InvoiceType CHAR (4 CHAR)																																		
PREMIUM_INVOICE_PK (InvoiceID)																																		
PREMIUM_INVOICE_LIFE_POLICY_FK (LIFE_POLICY_LifePolicyNumber)																																		
PREMIUM_INVOICE_AUTO_POLICY_FK (AUTO_POLICY_AutoPolicyNumber)																																		
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #ffffcc; text-align: left;">INSURANCE_COMPANY</th></tr> </thead> <tbody> <tr> <td>P * CompanyName CHAR (20 CHAR)</td></tr> <tr> <td>CompanyPhone CHAR (12 CHAR)</td></tr> <tr> <td> INSURANCE_COMPANY_PK (CompanyName)</td></tr> </tbody> </table>	INSURANCE_COMPANY	P * CompanyName CHAR (20 CHAR)	CompanyPhone CHAR (12 CHAR)	INSURANCE_COMPANY_PK (CompanyName)	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #ffffcc; text-align: left;">LIFE_POLICY</th></tr> </thead> <tbody> <tr> <td>P * LifePolicyNumber NUMBER (5)</td></tr> <tr> <td>F * ClientID NUMBER (5)</td></tr> <tr> <td>F * INSURANCE_COMPANY_CompanyName CHAR (20 CHAR)</td></tr> <tr> <td>LifePolicyEffectiveDate DATE</td></tr> <tr> <td>LifePolicyAmount NUMBER</td></tr> <tr> <td>LifePolicyType CHAR (20 CHAR)</td></tr> <tr> <td>AnnualLifePremium NUMBER</td></tr> <tr> <td> LIFE_POLICY_PK (LifePolicyNumber)</td></tr> <tr> <td> LIFE_POLICY_CLIENT_FK (INSURANCE_COMPANY_CompanyName)</td></tr> <tr> <td> LIFE_POLICY_CLIENT_FKv2 (ClientID)</td></tr> </tbody> </table>	LIFE_POLICY	P * LifePolicyNumber NUMBER (5)	F * ClientID NUMBER (5)	F * INSURANCE_COMPANY_CompanyName CHAR (20 CHAR)	LifePolicyEffectiveDate DATE	LifePolicyAmount NUMBER	LifePolicyType CHAR (20 CHAR)	AnnualLifePremium NUMBER	LIFE_POLICY_PK (LifePolicyNumber)	LIFE_POLICY_CLIENT_FK (INSURANCE_COMPANY_CompanyName)	LIFE_POLICY_CLIENT_FKv2 (ClientID)	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #ffffcc; text-align: left;">CLIENT-AUTO_POLICY</th></tr> </thead> <tbody> <tr> <td>P * AutoPolicyNumber NUMBER (5)</td></tr> <tr> <td>P * VehicleIdentificationNumber CHAR (17 CHAR)</td></tr> <tr> <td>P * DriverLicenseNumber CHAR (12 CHAR)</td></tr> <tr> <td>ClientID NUMBER (5)</td></tr> <tr> <td> CLIENT-AUTO_POLICY_PK (AutoPolicyNumber, VehicleIdentificationNumber, DriverLicenseNumber)</td></tr> </tbody> </table>	CLIENT-AUTO_POLICY	P * AutoPolicyNumber NUMBER (5)	P * VehicleIdentificationNumber CHAR (17 CHAR)	P * DriverLicenseNumber CHAR (12 CHAR)	ClientID NUMBER (5)	CLIENT-AUTO_POLICY_PK (AutoPolicyNumber, VehicleIdentificationNumber, DriverLicenseNumber)											
INSURANCE_COMPANY																																		
P * CompanyName CHAR (20 CHAR)																																		
CompanyPhone CHAR (12 CHAR)																																		
INSURANCE_COMPANY_PK (CompanyName)																																		
LIFE_POLICY																																		
P * LifePolicyNumber NUMBER (5)																																		
F * ClientID NUMBER (5)																																		
F * INSURANCE_COMPANY_CompanyName CHAR (20 CHAR)																																		
LifePolicyEffectiveDate DATE																																		
LifePolicyAmount NUMBER																																		
LifePolicyType CHAR (20 CHAR)																																		
AnnualLifePremium NUMBER																																		
LIFE_POLICY_PK (LifePolicyNumber)																																		
LIFE_POLICY_CLIENT_FK (INSURANCE_COMPANY_CompanyName)																																		
LIFE_POLICY_CLIENT_FKv2 (ClientID)																																		
CLIENT-AUTO_POLICY																																		
P * AutoPolicyNumber NUMBER (5)																																		
P * VehicleIdentificationNumber CHAR (17 CHAR)																																		
P * DriverLicenseNumber CHAR (12 CHAR)																																		
ClientID NUMBER (5)																																		
CLIENT-AUTO_POLICY_PK (AutoPolicyNumber, VehicleIdentificationNumber, DriverLicenseNumber)																																		
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #ffffcc; text-align: left;">AGENT-LIFE_POLICY</th></tr> </thead> <tbody> <tr> <td>P * LifePolicyNumber NUMBER (5)</td></tr> <tr> <td>AgentID NUMBER (5)</td></tr> <tr> <td> AGENT-LIFE_POLICY_PK (LifePolicyNumber)</td></tr> </tbody> </table>	AGENT-LIFE_POLICY	P * LifePolicyNumber NUMBER (5)	AgentID NUMBER (5)	AGENT-LIFE_POLICY_PK (LifePolicyNumber)	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #ffffcc; text-align: left;">VEHICLE</th></tr> </thead> <tbody> <tr> <td>P * VehicleIdentificationNumber CHAR (17 CHAR)</td></tr> <tr> <td>F * VehicleModel CHAR (20 CHAR)</td></tr> <tr> <td> VEHICLE_PK (VehicleIdentificationNumber)</td></tr> <tr> <td> VEHICLE_VEHICLE_2_FK (VehicleModel)</td></tr> </tbody> </table>	VEHICLE	P * VehicleIdentificationNumber CHAR (17 CHAR)	F * VehicleModel CHAR (20 CHAR)	VEHICLE_PK (VehicleIdentificationNumber)	VEHICLE_VEHICLE_2_FK (VehicleModel)	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #ffffcc; text-align: left;">VEHICLE_2</th></tr> </thead> <tbody> <tr> <td>P * VehicleModel CHAR (20 CHAR)</td></tr> <tr> <td>VehicleMake CHAR (15 CHAR)</td></tr> <tr> <td> VEHICLE_2_PK (VehicleModel)</td></tr> </tbody> </table>	VEHICLE_2	P * VehicleModel CHAR (20 CHAR)	VehicleMake CHAR (15 CHAR)	VEHICLE_2_PK (VehicleModel)																			
AGENT-LIFE_POLICY																																		
P * LifePolicyNumber NUMBER (5)																																		
AgentID NUMBER (5)																																		
AGENT-LIFE_POLICY_PK (LifePolicyNumber)																																		
VEHICLE																																		
P * VehicleIdentificationNumber CHAR (17 CHAR)																																		
F * VehicleModel CHAR (20 CHAR)																																		
VEHICLE_PK (VehicleIdentificationNumber)																																		
VEHICLE_VEHICLE_2_FK (VehicleModel)																																		
VEHICLE_2																																		
P * VehicleModel CHAR (20 CHAR)																																		
VehicleMake CHAR (15 CHAR)																																		
VEHICLE_2_PK (VehicleModel)																																		
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #ffffcc; text-align: left;">AGENT-AUTO_POLICY</th></tr> </thead> <tbody> <tr> <td>P * AutoPolicyNumber NUMBER (5)</td></tr> <tr> <td>AgentID NUMBER (5)</td></tr> <tr> <td> AGENT-AUTO_POLICY_PK (AutoPolicyNumber)</td></tr> </tbody> </table>	AGENT-AUTO_POLICY	P * AutoPolicyNumber NUMBER (5)	AgentID NUMBER (5)	AGENT-AUTO_POLICY_PK (AutoPolicyNumber)	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #ffffcc; text-align: left;">DRIVER</th></tr> </thead> <tbody> <tr> <td>P * DriverLicenseNumber CHAR (12 CHAR)</td></tr> <tr> <td>DriverLicenseExpiration DATE</td></tr> <tr> <td>DriverLicenseState CHAR (2 CHAR)</td></tr> <tr> <td> DRIVER_PK (DriverLicenseNumber)</td></tr> </tbody> </table>	DRIVER	P * DriverLicenseNumber CHAR (12 CHAR)	DriverLicenseExpiration DATE	DriverLicenseState CHAR (2 CHAR)	DRIVER_PK (DriverLicenseNumber)																								
AGENT-AUTO_POLICY																																		
P * AutoPolicyNumber NUMBER (5)																																		
AgentID NUMBER (5)																																		
AGENT-AUTO_POLICY_PK (AutoPolicyNumber)																																		
DRIVER																																		
P * DriverLicenseNumber CHAR (12 CHAR)																																		
DriverLicenseExpiration DATE																																		
DriverLicenseState CHAR (2 CHAR)																																		
DRIVER_PK (DriverLicenseNumber)																																		

Normalized Relational Model Assumptions for Insurance Agency
Policy Tracking Database System

General:

1. Agent names are not unique
2. Agent commissions are 5% of sold policy premiums
3. Client names are not unique
4. ClientStreet values are not unique
5. ClientCity names are not unique
6. An INSURANCE COMPANY has precisely one HQ CompanyPhone number
7. LifePolicyAmount does not depend on the LifePolicyType (i.e., two different LifePolicyType values can have the same LifePolicyAmount)
8. DriverLicenseNumber values are unique

New Tables:

1. VehicleIdentificationNumber and DriverLicenseNumber in CLIENT-AUTO POLICY table become concatenated primary key with AutoPolicyNumber
2. DriverLicenseExpiration and DriverLicenseState moved to new table DRIVER due to independence from CLIENT-AUTO POLICY concatenated primary key with DriverLicenseNumber being primary key
3. VehicleModel and VehicleMake moved to new table VEHICLE due to independence from CLIENT-AUTO POLICY concatenated primary key with VehicleIdentificationNumber being primary key
 - a. VehicleMake moved to new table VEHICLE 2 due to dependence on VehicleModel with VehicleModel being primary key
 - b. VehicleModel remains as foreign key in VEHICLE table

Normalized Relational Model Assumptions for Insurance Agency

Policy Tracking Database System (cont.)

Calculated Fields:

1. TotalAnnualAutoPremium removed from AUTO POLICY table
 - a. $\text{TotalAnnualAutoPremium} = \text{SUM}\{\text{AnnualAutoPremium}\}$
2. TotalAnnualLifePremium removed from LIFE POLICY table
 - a. $\text{TotalAnnualLifePremium} = \text{SUM}\{\text{AnnualLifePremium}\}$
3. NumberOfClients removed from AGENT table
 - a. $\text{NumberOfClients} = \text{COUNT}\{\text{ClientID}\}$
4. NumberOfAutoPolicies removed from AUTO POLICY table
 - a. $\text{NumberOfAutoPolicies} = \text{COUNT}\{\text{AutoPolicyNumber}\}$
5. NumberOfLifePolicies removed from LIFE POLICY table
 - a. $\text{NumberOfLifePolicies} = \text{COUNT}\{\text{LifePolicyNumber}\}$
6. AnnualAutoPolicyCommission removed from AGENT-AUTO table
 - a. $\text{AnnualAutoPolicyCommission} = \text{SUM}\{\text{AnnualAutoPremium} * 5\%\}$
7. AnnualLifePolicyCommission removed from AGENT-LIFE table
 - a. $\text{AnnualLifePolicyCommission} = \text{SUM}\{\text{AnnualLifePremium} * 5\%\}$
8. TotalAnnualAutoCommission removed from AGENT-AUTO table
 - a. $\text{TotalAnnualAutoCommission} = \text{SUM}\{\text{AnnualAutoPremium} * 5\%\}$
9. TotalAnnualLifeCommission removed from AGENT-LIFE table
 - a. $\text{TotalAnnualLifeCommission} = \text{SUM}\{\text{AnnualLifePremium} * 5\%\}$
10. NumberOfLifePoliciesByAgent removed from AGENT-LIFE POLICY table
 - a. $\text{NumberOfLifePoliciesByAgent} = \text{COUNT}\{\text{LifePolicyNumber}\}$
11. NumberOfAutoPoliciesByAgent removed from AGENT-AUTO POLICY table
 - a. $\text{NumberOfAutoPoliciesByAgent} = \text{COUNT}\{\text{AutoPolicyNumber}\}$

Data Definition Language Script for Insurance Agency Policy Tracking Database System

```
CREATE TABLE AGENT(
    AgentID NUMBER(5) NOT NULL,
    AgentFirstName CHAR(20),
    AgentLastName CHAR(20),
    AgentPhone CHAR(12));

ALTER TABLE AGENT
    ADD CONSTRAINT AGENT_PK PRIMARY KEY (AgentID);

CREATE TABLE "AGENT-AUTO POLICY"( 
    AutoPolicyNumber NUMBER(5) NOT NULL,
    AgentID NUMBER(5));

ALTER TABLE "AGENT-AUTO POLICY"
    ADD CONSTRAINT "AGENT-AUTO POLICY_PK" PRIMARY KEY (AutoPolicyNumber);

CREATE TABLE "AGENT-LIFE POLICY"( 
    LifePolicyNumber NUMBER(5) NOT NULL,
    AgentID NUMBER(5));

ALTER TABLE "AGENT-LIFE POLICY"
    ADD CONSTRAINT "AGENT-LIFE POLICY_PK" PRIMARY KEY (LifePolicyNumber);

CREATE TABLE AUTO_POLICY(
    AutoPolicyNumber NUMBER(5) NOT NULL,
    INSURANCE_COMPANY_CompanyName CHAR(20) NOT NULL,
    AutoPolicyEffectiveDate DATE,
    AutoPolicyAmount NUMBER,
    AnnualAutoPremium NUMBER);

ALTER TABLE AUTO_POLICY
    ADD CONSTRAINT AUTO_POLICY_PK PRIMARY KEY (AutoPolicyNumber);

CREATE TABLE CLAIM(
    ClaimNumber NUMBER(4) NOT NULL,
    AUTO_POLICY_AutoPolicyNumber NUMBER(5) NOT NULL,
    LIFE_POLICY_LifePolicyNumber NUMBER(5) NOT NULL,
    ClaimAmount NUMBER,
    ClaimType CHAR(4),
    ClaimDate DATE);

ALTER TABLE CLAIM
    ADD CONSTRAINT CLAIM_PK PRIMARY KEY (ClaimNumber);
```

Data Definition Language Script for Insurance Agency Policy Tracking Database System (cont.)

```
CREATE TABLE CLIENT(
    ClientID NUMBER(5) NOT NULL,
    ClientFirstName CHAR(20),
    ClientLastName CHAR(20),
    ClientStreet CHAR(20),
    ClientCity CHAR(20),
    ClientState CHAR(2),
    ClientZip NUMBER(5),
    ClientPhone CHAR(12),
    ClientDateOfBirth DATE,
    ClientSex CHAR(1));

ALTER TABLE CLIENT
    ADD CONSTRAINT CLIENT_PK PRIMARY KEY (ClientID);

CREATE TABLE "CLIENT-AUTO POLICY"( 
    AutoPolicyNumber NUMBER(5) NOT NULL,
    VehicleIdentificationNumber CHAR(17) NOT NULL,
    DriverLicenseNumber CHAR(12) NOT NULL,
    ClientID NUMBER(5));

ALTER TABLE "CLIENT-AUTO POLICY"
    ADD CONSTRAINT "CLIENT-AUTO POLICY_PK" PRIMARY KEY (AutoPolicyNumber,
VehicleIdentificationNumber, DriverLicenseNumber);

CREATE TABLE DRIVER(
    DriverLicenseNumber CHAR(12) NOT NULL,
    DriverLicenseExpiration DATE,
    DriverLicenseState CHAR(2));

ALTER TABLE DRIVER
    ADD CONSTRAINT DRIVER_PK PRIMARY KEY (DriverLicenseNumber);

CREATE TABLE INSURANCE_COMPANY(
    CompanyName CHAR(20) NOT NULL,
    CompanyPhone CHAR(12));

ALTER TABLE INSURANCE_COMPANY
    ADD CONSTRAINT INSURANCE_COMPANY_PK PRIMARY KEY (CompanyName);
```

Data Definition Language Script for Insurance Agency Policy Tracking Database System (cont.)

```
CREATE TABLE LIFE_POLICY(
    LifePolicyNumber NUMBER(5) NOT NULL,
    ClientID NUMBER(5) NOT NULL,
    INSURANCE_COMPANY_CompanyName CHAR(20) NOT NULL,
    LifePolicyEffectiveDate DATE,
    LifePolicyAmount NUMBER,
    LifePolicyType CHAR(20),
    AnnualLifePremium NUMBER);
```

```
ALTER TABLE LIFE_POLICY
    ADD CONSTRAINT LIFE_POLICY_PK PRIMARY KEY (LifePolicyNumber);
```

```
CREATE TABLE PAYMENT(
    PaymentID NUMBER(5) NOT NULL,
    PREMIUM_INVOICE_InvoiceID NUMBER(5) NOT NULL,
    PaymentAmount NUMBER,
    PaymentDate DATE,
    PaymentType CHAR(4));
```

```
ALTER TABLE PAYMENT
    ADD CONSTRAINT PAYMENT_PK PRIMARY KEY (PaymentID);
```

```
CREATE TABLE PREMIUM_INVOICE(
    InvoiceID NUMBER(5) NOT NULL,
    AUTO_POLICY_AutoPolicyNumber NUMBER(5) NOT NULL,
    LIFE_POLICY_LifePolicyNumber NUMBER(5) NOT NULL,
    InvoiceAmount NUMBER,
    InvoiceDate DATE,
    InvoiceType CHAR(4));
```

```
ALTER TABLE PREMIUM_INVOICE
    ADD CONSTRAINT PREMIUM_INVOICE_PK PRIMARY KEY (InvoiceID);
```

```
CREATE TABLE VEHICLE(
    VehicleIdentificationNumber CHAR(17) NOT NULL,
    VehicleModel CHAR(20) NOT NULL);
```

```
ALTER TABLE VEHICLE
    ADD CONSTRAINT VEHICLE_PK PRIMARY KEY (VehicleIdentificationNumber);
```

```
CREATE TABLE VEHICLE_2(
    VehicleModel CHAR(20) NOT NULL,
    VehicleMake CHAR(15));
```

Data Definition Language Script for Insurance Agency Policy Tracking Database System (cont.)

```
ALTER TABLE VEHICLE_2
    ADD CONSTRAINT "VEHICLE 2_PK" PRIMARY KEY (VehicleModel);

ALTER TABLE AUTO_POLICY
    ADD CONSTRAINT AUTO_POLICY_AGENT_FK
    FOREIGN KEY(INSURANCE_COMPANY_CompanyName)
    REFERENCES INSURANCE_COMPANY(CompanyName);

ALTER TABLE CLAIM
    ADD CONSTRAINT CLAIM_AUTO_POLICY_FK
    FOREIGN KEY(AUTO_POLICY_AutoPolicyNumber)
    REFERENCES AUTO_POLICY(AutoPolicyNumber);

ALTER TABLE CLAIM
    ADD CONSTRAINT CLAIM_LIFE_POLICY_FK
    FOREIGN KEY(LIFE_POLICY_LifePolicyNumber)
    REFERENCES LIFE_POLICY(LifePolicyNumber);

ALTER TABLE LIFE_POLICY
    ADD CONSTRAINT LIFE_POLICY_CLIENT_FK
    FOREIGN KEY(INSURANCE_COMPANY_CompanyName)
    REFERENCES INSURANCE_COMPANY(CompanyName);

ALTER TABLE LIFE_POLICY
    ADD CONSTRAINT LIFE_POLICY_CLIENT_FKv2
    FOREIGN KEY(ClientID)
    REFERENCES CLIENT(ClientID);

ALTER TABLE PAYMENT
    ADD CONSTRAINT PAYMENT_PREMIUM_INVOICE_FK
    FOREIGN KEY(PREMIUM_INVOICE_InvoiceID)
    REFERENCES PREMIUM_INVOICE(InvoiceID);

ALTER TABLE PREMIUM_INVOICE
    ADD CONSTRAINT PREMIUM_INVOICE_AUTO_POLICY_FK
    FOREIGN KEY(AUTO_POLICY_AutoPolicyNumber)
    REFERENCES AUTO_POLICY(AutoPolicyNumber);

ALTER TABLE PREMIUM_INVOICE
    ADD CONSTRAINT PREMIUM_INVOICE_LIFE_POLICY_FK
    FOREIGN KEY(LIFE_POLICY_LifePolicyNumber)
    REFERENCES LIFE_POLICY(LifePolicyNumber);
```

Data Definition Language Script for Insurance Agency Policy Tracking Database System (cont.)

```
ALTER TABLE VEHICLE
    ADD CONSTRAINT "VEHICLE_VEHICLE_2_FK"
    FOREIGN KEY(VehicleModel)
    REFERENCES VEHICLE_2(VehicleModel);
```

-- Address need for null allowance in PREMIUM INVOICE and CLAIM tables

```
ALTER TABLE PREMIUM_INVOICE
MODIFY (
    AUTO_POLICY_AUTOPOLICYNUMBER NULL,
    LIFE_POLICY_LIFEPOLICYNUMBER NULL
);
```

```
ALTER TABLE PREMIUM_INVOICE
ADD CONSTRAINT PREMIUM_INVOICE_ONE_OR_THE_OTHER
CHECK (
    (AUTO_POLICY_AUTOPOLICYNUMBER IS NULL AND
    LIFE_POLICY_LIFEPOLICYNUMBER IS NOT NULL) OR
    (AUTO_POLICY_AUTOPOLICYNUMBER IS NOT NULL AND
    LIFE_POLICY_LIFEPOLICYNUMBER IS NULL)
);
```

```
ALTER TABLE CLAIM
MODIFY (
    AUTO_POLICY_AUTOPOLICYNUMBER NULL,
    LIFE_POLICY_LIFEPOLICYNUMBER NULL
);
```

```
ALTER TABLE CLAIM
ADD CONSTRAINT CLAIM_ONE_OR_THE_OTHER
CHECK (
    (AUTO_POLICY_AUTOPOLICYNUMBER IS NULL AND
    LIFE_POLICY_LIFEPOLICYNUMBER IS NOT NULL) OR
    (AUTO_POLICY_AUTOPOLICYNUMBER IS NOT NULL AND
    LIFE_POLICY_LIFEPOLICYNUMBER IS NULL)
);
```

Table Structures for All Tables in Oracle APEX

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
AGENT	AGENTID	NUMBER	-	5	0	1	-	-	-
	AGENTFIRSTNAME	CHAR	20	-	-	-	✓	-	-
	AGENTLASTNAME	CHAR	20	-	-	-	✓	-	-
	AGENTPHONE	CHAR	12	-	-	-	✓	-	-

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
AGENT-AUTO POLICY	AUTOPOLICYNUMBER	NUMBER	-	5	0	1	-	-	-
	AGENTID	NUMBER	-	5	0	-	✓	-	-

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
AGENT-LIFE POLICY	LIFEPOLICYNUMBER	NUMBER	-	5	0	1	-	-	-
	AGENTID	NUMBER	-	5	0	-	✓	-	-

Table Structures for All Tables in Oracle APEX (cont.)

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
AUTO_POLICY	AUTOPOLICYNUMBER	NUMBER	-	5	0	1	-	-	-
	INSURANCE_COMPANY_COMPANYNAME	CHAR	20	-	-	-	-	-	-
	AUTOPOLICYEFFECTIVEDATE	DATE	7	-	-	-	✓	-	-
	AUTOPOLICYAMOUNT	NUMBER	22	-	-	-	✓	-	-
	ANNUALAUTOPREMIUM	NUMBER	22	-	-	-	✓	-	-

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
CLAIM	CLAIMNUMBER	NUMBER	-	4	0	1	-	-	-
	AUTO_POLICY_AUTOPOLICYNUMBER	NUMBER	-	5	0	-	✓	-	-
	LIFE_POLICY_LIFEPOLICYNUMBER	NUMBER	-	5	0	-	✓	-	-
	CLAIMAMOUNT	NUMBER	22	-	-	-	✓	-	-
	CLAIMTYPE	CHAR	4	-	-	-	✓	-	-
	CLAIMDATE	DATE	7	-	-	-	✓	-	-

Table Structures for All Tables in Oracle APEX (cont.)

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
CLIENT	CLIENTID	NUMBER	-	5	0	1	-	-	-
	CLIENTFIRSTNAME	CHAR	20	-	-	-	✓	-	-
	CLIENTLASTNAME	CHAR	20	-	-	-	✓	-	-
	CLIENTSTREET	CHAR	20	-	-	-	✓	-	-
	CLIENTCITY	CHAR	20	-	-	-	✓	-	-
	CLIENTSTATE	CHAR	2	-	-	-	✓	-	-
	CLIENTZIP	NUMBER	-	5	0	-	✓	-	-
	CLIENTPHONE	CHAR	12	-	-	-	✓	-	-
	CLIENTDATEOFBIRTH	DATE	7	-	-	-	✓	-	-
	CLIENTSEX	CHAR	1	-	-	-	✓	-	-

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
CLIENT-AUTO POLICY	AUTOPOLICYNUMBER	NUMBER	-	5	0	1	-	-	-
	VEHICLEIDENTIFICATIONNUMBER	CHAR	17	-	-	2	-	-	-
	DRIVERLICENSENUMBER	CHAR	12	-	-	3	-	-	-
	CLIENTID	NUMBER	-	5	0	-	✓	-	-

Table Structures for All Tables in Oracle APEX (cont.)

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
DRIVER	DRIVERLICENSENUMBER	CHAR	12	-	-	1	-	-	-
	DRIVERLICENSEEXPIRATION	DATE	7	-	-	-	✓	-	-
	DRIVERLICENSESTATE	CHAR	2	-	-	-	✓	-	-

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
INSURANCE_COMPANY	COMPANYNAME	CHAR	20	-	-	1	-	-	-
	COMPANYPHONE	CHAR	12	-	-	-	✓	-	-

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
LIFE_POLICY	LIFEPOLICYNUMBER	NUMBER	-	5	0	1	-	-	-
	CLIENTID	NUMBER	-	5	0	-	-	-	-
	INSURANCE_COMPANY_COMPANYNAME	CHAR	20	-	-	-	-	-	-
	LIFEPOLICYEFFECTIVEDATE	DATE	7	-	-	-	✓	-	-
	LIFEPOLICYAMOUNT	NUMBER	22	-	-	-	✓	-	-
	LIFEPOLICYTYPE	CHAR	20	-	-	-	✓	-	-
	ANNUALLIFEPREMIUM	NUMBER	22	-	-	-	✓	-	-

Table Structures for All Tables in Oracle APEX (cont.)

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
PAYMENT	PAYMENTID	NUMBER	-	5	0	1	-	-	-
	PREMIUM_INVOICE_INVOICEID	NUMBER	-	5	0	-	-	-	-
	PAYOUTAMOUNT	NUMBER	22	-	-	-	✓	-	-
	PAYOUTDATE	DATE	7	-	-	-	✓	-	-
	PAYOUTTYPE	CHAR	4	-	-	-	✓	-	-

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
PREMIUM_INVOICE	INVOICEID	NUMBER	-	5	0	1	-	-	-
	AUTO_POLICY_AUTOPOLICYNUMBER	NUMBER	-	5	0	-	✓	-	-
	LIFE_POLICY_LIFEPOLICYNUMBER	NUMBER	-	5	0	-	✓	-	-
	INVOICEAMOUNT	NUMBER	22	-	-	-	✓	-	-
	INVOICEDATE	DATE	7	-	-	-	✓	-	-
	INVOICETYPE	CHAR	4	-	-	-	✓	-	-

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
VEHICLE	VEHICLEIDENTIFICATIONNUMBER	CHAR	17	-	-	1	-	-	-
	VEHICLEMODEL	CHAR	20	-	-	-	-	-	-

Table Structures for All Tables in Oracle APEX (cont.)

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
VEHICLE_2	VEHICLEMODEL	CHAR	20	-	-	1	-	-	-
	VEHICLEMAKE	CHAR	15	-	-	-	✓	-	-

Tables With Data from Oracle APEX

AGENT

AGENTID	AGENTFIRSTNAME	AGENTLASTNAME	AGENTPHONE
11111	Peter	Parker	212-223-2345
11112	Tony	Stark	212-544-3421
11113	Carol	Danvers	212-546-3321

AGENT-AUTO POLICY

AUTOPOLICYNUMBER	AGENTID
33332	11111
33331	11113
33333	11111

AGENT-LIFE POLICY

LIFEPOLICYNUMBER	AGENTID
44443	11113
44441	11112
44442	11112

AUTO_POLICY

AUTOPOLICYNUMBER	INSURANCE_COMPANY_COMPANYNAME	AUTOPOLICYEFFECTIVEDATE	AUTOPOLICYAMOUNT	ANNUALAUTOPREMIUM
33332	NoState	2/1/2025	35000	900
33331	SafeArm	5/1/2025	50000	1200
33333	Regressive	7/1/2025	75000	1560

CLAIM

CLAIMNUMBER	AUTO_POLICY_AUTOPOLICYNUMBER	LIFE_POLICY_LIFEPOLICYNUMBER	CLAIMAMOUNT	CLAIMTYPE	CLAIMDATE
7772	33332		12000	Auto	5/10/2025
7773	33333		3500	Auto	9/21/2025
7771	33331		1000	Auto	7/16/2025

Tables With Data from Oracle APEX (cont.)

CLIENT

CLIENTID	CLIENTFIRSTNAME	CLIENTLASTNAME	CLIENTSTREET	CLIENTCITY	CLIENTSTATE	CLIENTZIP	CLIENTPHONE	CLIENTDATEOFBIRTH	CLIENTSEX
22223	Maddy	Quattlander	667 Madison Ave	New York	NY	10001	212-542-6788	6/28/2003	F
22221	Jon	Parks	321 Mulholland Dr	Los Angeles	CA	90210	212-436-7775	10/1/1999	M
22222	Sofi	Williner	1530 West Cass St	Tampa	FL	33606	212-457-4531	5/26/2002	F

CLIENT-AUTO POLICY

AUTOPOLICYNUMBER	VEHICLEIDENTIFICATIONNUMBER	DRIVERLICENSENUMBER	CLIENTID
33332	DEF12345678901234	SF1234567890	22222
33331	JKL12345678901234	JP2345678901	22221
33331	ABC12345678901234	JP1234567890	22221
33333	GHI12345678901234	MQ1234567890	22223

DRIVER

DRIVERLICENSENUMBER	DRIVERLICENSEEXPIRATION	DRIVERLICENSESTATE
SF1234567890	10/16/2028	FL
JP2345678901	2/10/2029	CA
JP1234567890	12/2/2027	CA
MQ1234567890	5/19/2026	NY

INSURANCE_COMPANY

COMPANYNAME	COMPANYPHONE
SafeArm	800-341-8864
Regressive	800-343-4567
NoState	800-345-3966

LIFE_POLICY

LIFEPOLICYNUMBER	CLIENTID	INSURANCE_COMPANY_COMPANYNAME	LIFEPOLICYEFFECTIVEDATE	LIFEPOLICYAMOUNT	LIFEPOLICYTYPE	ANNUALLIFEpremium
44441	22222	NoState	10/1/2025	1000000	Whole Life	10000
44442	22221	SafeArm	3/1/2025	1000000	Term	700
44443	22223	Regressive	5/1/2025	1000000	Whole Life	11000

Tables With Data from Oracle APEX (cont.)

PAYMENT

PAYMENTID	PREMIUM_INVOICE_INVOICEID	PAYMENTAMOUNT	PAYMENTDATE	PAYMENTTYPE
66662	55551	100	6/2/2025	Auto
66663	55552	917	7/4/2025	Life
66661	55553	75	3/3/2025	Auto

PREMIUM_INVOICE

INVOICEID	AUTO_POLICY_AUTOPOLICYNUMBER	LIFE_POLICY_LIFEPOLICYNUMBER	INVOICEAMOUNT	INVOICEDATE	INVOICETYPE
55552		44443	917	7/1/2025	Life
55551	33331		100	6/1/2025	Auto
55553	33332		75	3/1/2025	Auto

VEHICLE

VEHICLEIDENTIFICATIONNUMBER	VEHICLEMODEL
DEF12345678901234	Envista
GHI12345678901234	Outback
ABC12345678901234	Golf
JKL12345678901234	Tiguan

VEHICLE_2

VEHICLEMODEL	VEHICLEMAKE
Golf	Volkswagen
Outback	Subaru
Envista	Buick
Tiguan	Volkswagen

Database Sample Queries and Output

Queries (numbered)

1. Fetch client ID's, the client's enrolled auto policy number, and corresponding insurance agent's last name and phone number. Order the results by descending client ID.

```
SELECT
    DISTINCT CLIENT.ClientID, "CLIENT-AUTO POLICY".AutoPolicyNumber, AGENT.AgentLastName,
    AGENT.AgentPhone
FROM CLIENT
LEFT JOIN "CLIENT-AUTO POLICY" ON CLIENT.ClientID = "CLIENT-AUTO POLICY".ClientID
LEFT JOIN "AGENT-AUTO POLICY" ON "CLIENT-AUTO POLICY".AutoPolicyNumber = "AGENT-AUTO
POLICY".AutoPolicyNumber
LEFT JOIN AGENT ON "AGENT-AUTO POLICY".AgentID = AGENT.AgentID
ORDER BY CLIENT.ClientID DESC;
```

CLIENTID	AUTOPOLICYNUMBER	AGENTLASTNAME	AGENTPHONE
22223	33333	Parker	212-223-2345
22222	33332	Parker	212-223-2345
22221	33331	Danvers	212-546-3321

Database Sample Queries and Output (cont.)

2. Obtain the claim number, date, amount, and relevant insurance company name and phone number for all auto claims made.

SELECT

```

CLAIM.ClaimNumber, CLAIM.ClaimDate, CLAIM.ClaimAmount, INSURANCE_COMPANY.CompanyName,
INSURANCE_COMPANY.CompanyPhone
FROM CLAIM
LEFT JOIN AUTO_POLICY ON CLAIM.AUTO_POLICY_AutoPolicyNumber = AUTO_POLICY.AutoPolicyNumber
LEFT JOIN INSURANCE_COMPANY ON AUTO_POLICY.INSURANCE_COMPANY_CompanyName =
INSURANCE_COMPANY.CompanyName
WHERE CLAIM.ClaimType = 'Auto';

```

CLAIMNUMBER	CLAIMDATE	CLAIMAMOUNT	COMPANYNAME	COMPANYPHONE
7772	5/10/2025	12000	NoState	800-345-3966
7773	9/21/2025	3500	Regressive	800-343-4567
7771	7/16/2025	1000	SafeArm	800-341-8864

3. Get the auto policy number, premium invoice data and amount, along with the corresponding payment date and amount for all auto policy payments.

```

SELECT PREMIUM_INVOICE.AUTO_POLICY_AutoPolicyNumber, PREMIUM_INVOICE.InvoiceDate,
PREMIUM_INVOICE.InvoiceAmount, PAYMENT.PaymentDate, PAYMENT.PaymentAmount
FROM PREMIUM_INVOICE
JOIN PAYMENT ON PAYMENT.PREMIUM_INVOICE_InvoiceID = PREMIUM_INVOICE.InvoiceID
WHERE PREMIUM_INVOICE.InvoiceType = 'Auto';

```

AUTO_POLICY_AUTOPOLICYNUMBER	INVOICEDATE	INVOICEAMOUNT	PAYMENTDATE	PAYMENTAMOUNT
33331	6/1/2025	100	6/2/2025	100
33332	3/1/2025	75	3/3/2025	75

Database Sample Queries and Output (cont.)

4. Obtain the client's first and last name, life policy information, and issuing insurance company information (name and phone).

SELECT

```

CLIENT.ClientFirstName, CLIENT.ClientLastName, LIFE_POLICY.LifePolicyNumber,
INSURANCE_COMPANY.CompanyName, INSURANCE_COMPANY.CompanyPhone,
LIFE_POLICY.LifePolicyEffectiveDate, LIFE_POLICY.LifePolicyAmount, LIFE_POLICY.LifePolicyType
FROM CLIENT
JOIN LIFE_POLICY ON LIFE_POLICY.ClientID = CLIENT.ClientID
JOIN INSURANCE_COMPANY ON INSURANCE_COMPANY.CompanyName =
LIFE_POLICY.INSURANCE_COMPANY_CompanyName;

```

CLIENTFIRSTNAME	CLIENTLASTNAME	LIFEPOLICYNUMBER	COMPANYNAME	COMPANYPHONE	LIFEPOLICYEFFECTIVEDATE	LIFEPOLICYAMOUNT	LIFEPOLICYTYPE
Sofi	Williner	44441	NoState	800-345-3966	10/1/2025	1000000	Whole Life
Jon	Parks	44442	SafeArm	800-341-8864	3/1/2025	1000000	Term
Maddy	Quattlander	44443	Regressive	800-343-4567	5/1/2025	1000000	Whole Life

5. Fetch agent ID, first name, last name, and the number of auto policies the agent has sourced.

SELECT

```

AGENT.AgentID, AGENT.AgentFirstName, AGENT.AgentLastName, COUNT("AGENT-AUTO
POLICY".AutoPolicyNumber) AS NumberOfAutoPolicies
FROM AGENT
JOIN "AGENT-AUTO POLICY" ON "AGENT-AUTO POLICY".AgentID = AGENT.AgentID
GROUP BY AGENT.AgentID, AGENT.AgentFirstName, AGENT.AgentLastName
ORDER BY NumberOfAutoPolicies DESC;

```

AGENTID	AGENTFIRSTNAME	AGENTLASTNAME	NUMBEROFAUTOPOLICIES
11111	Peter	Parker	2
11113	Carol	Danvers	1

Database Sample Queries and Output (cont.)

6. Obtain agent first and last name and annual life policy commission amount for agent named Carol Danvers.

```

SELECT
    AGENT.AgentFirstName, AGENT.AgentLastName,
    SUM(LIFE_POLICY.AnnualLifePremium * 0.05) AS AnnualLifeCommission
FROM AGENT
JOIN "AGENT-LIFE POLICY" ON "AGENT-LIFE POLICY".AgentID = AGENT.AgentID
JOIN LIFE_POLICY ON LIFE_POLICY.LifePolicyNumber = "AGENT-LIFE POLICY".LifePolicyNumber
WHERE AGENT.AgentLastName = 'Danvers'
GROUP BY AGENT.AgentFirstName, AGENT.AgentLastName;

```

AGENTFIRSTNAME	AGENTLASTNAME	ANNUALLIFECOMMISSION
Carol	Danvers	550

7. Get the auto policy number and number of vehicles on the auto policy owned by the client with last name “Parks”.

```

SELECT
    "CLIENT-AUTO POLICY".AutoPolicyNumber,
    COUNT(VEHICLE.VehicleIdentificationNumber) AS NumberOfVehicles
FROM "CLIENT-AUTO POLICY"
JOIN VEHICLE ON VEHICLE.VehicleIdentificationNumber = "CLIENT-AUTO POLICY".VehicleIdentificationNumber
JOIN CLIENT ON "CLIENT-AUTO POLICY".ClientID = CLIENT.ClientID
WHERE CLIENT.ClientLastName = 'Parks'
GROUP BY "CLIENT-AUTO POLICY".AutoPolicyNumber;

```

AUTOPOLICYNUMBER	NUMBEROFGVEHICLES
33331	2

Database Sample Queries and Output (cont.)

8. Obtain the auto policy number, amount, and issuing company phone number for policies with policy amounts exceeding \$49k issued by SafeArm.

SELECT

```

    AUTO_POLICY.AutoPolicyNumber, AUTO_POLICY.AutoPolicyAmount,
    INSURANCE_COMPANY.CompanyPhone
FROM AUTO_POLICY
JOIN INSURANCE_COMPANY ON INSURANCE_COMPANY.CompanyName =
    AUTO_POLICY.INSURANCE_COMPANY_CompanyName
WHERE INSURANCE_COMPANY.CompanyName = 'SafeArm' AND AUTO_POLICY.AutoPolicyAmount > 49000;

```

AUTOPOLICYNUMBER	AUTOPOLICYAMOUNT	COMPANYPHONE
33331	50000	800-341-8864

9. Fetch the auto policy number, policy effective date, policy amount, and issuing insurance company name and phone number for all auto policies issued after March 1st, 2025.

SELECT

```

    AUTO_POLICY.AutoPolicyNumber, AUTO_POLICY.AutoPolicyEffectiveDate, AUTO_POLICY.AutoPolicyAmount,
    INSURANCE_COMPANY.CompanyName, INSURANCE_COMPANY.CompanyPhone
FROM AUTO_POLICY
JOIN INSURANCE_COMPANY ON INSURANCE_COMPANY.CompanyName =
    AUTO_POLICY.INSURANCE_COMPANY_CompanyName
WHERE AUTO_POLICY.AutoPolicyEffectiveDate > '03-01-2025';

```

AUTOPOLICYNUMBER	AUTOPOLICYEFFECTIVEDATE	AUTOPOLICYAMOUNT	COMPANYNAME	COMPANYPHONE
33331	5/1/2025	50000	SafeArm	800-341-8864
33333	7/1/2025	75000	Regressive	800-343-4567

Database Tables in Oracle APEX

APEX App Builder SQL Workshop Team Development Gallery Search Schema WKSP_PA

Object Browser

Type to filter... +

Tables

- AGENT (selected)
- AGENT-AUTO POLICY
- AGENT-LIFE POLICY
- AUTO_POLICY
- CLAIM
- CLIENT
- CLIENT-AUTO POLICY
- DRIVER
- INSURANCE_COMPANY
- LIFE_POLICY
- PAYMENT
- PREMIUM_INVOICE
- VEHICLE
- VEHICLE_2

Views

Indexes

Sequences

Types

Packages

Procedures

Functions

Triggers

Database Links

Materialized Views

1 cells selected

AGENT

Columns Data Indexes Constraints Grants Statistics Triggers Dependencies DDL Sample Queries

+ Insert Row Columns... Filter... Count Rows Load Data Download Refresh

	AGENTID	AGENTFIRSTNAME	AGENTLASTNAME	AGENTPHONE
<input type="text"/>	1111	Peter	Parker	212-223-2345
<input type="text"/>	1112	Tony	Stark	212-544-3421
<input type="text"/>	1113	Carol	Danvers	212-546-3321

jept7@fordham.edu parks_apex_fordham en Copyright © 1999, 2024, Oracle and/or its affiliates.