## **Question 1**

a) Data Model: Display the data model "Business partner" FI\_\_\_10159 in the Data Modeler (this is the data model we have already analyzed in the last exercise; note that it has three underscores in its name).
i) Which relationship ((in SAP's SERM terminology) is defined between the entity types "Business Partner" and "Customer" (ID 12014) ?



"Customer" (located in the lower right corner of the screenshot) is a specialisation of "Business Partner" (upper left part).

*ii)* Which relationship is defined between the entity types "House Bank" and "Company Code - House Bank"? What are the cardinalities of this relationship?

Data Modeler: Graphics (Display Mode)
Graphic Edit Goto Utilities Settings View Help
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Display area
M66 46C R/3

The 1:cm-aggregation assigns arbitrarily "Company Code – House Bank" to each "House Bank".

*b) Metadata Management (Dictionary): Analyze table KNA1 (we have already found out in the last exercise that this table contains the customers).* 

i) How many attributes does KNA1 have ?

Unfortunately, I did not find a dialog which explicitly tells me the exact number of attributes. Nevertheless, the scrollbar displays a tooltip while dragging it. Its upper limit – when scrolled to the bottom – are astonishing 140. Therefore, I suppose that the number of KNA1's attributes should be 140.

ii) How is this table mapped to table(s) of the underlying database system ?

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NAME1	NAME1 GP	CHAR 35 0	Name 1
NAME2	NAME2 GP	CHAR 35 0	Name 2
ORT01	ORT01 GP	CHAR 35 0	City
PSTLZ	PSTLZ	CHAR 10 0	Postal Code
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As a transparent table, KNA1 maps 1:1 to a database table (see first line, marked by a dotted line). *iii) What are the names of the key attributes of this table ?* 

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Dictionary: Display Table
Transparent table KNA1 Active
Short description General Data in Customer Master
Attributes Fields Currency/quant fields
Fields Key Init. Field type
MANDT MANDT
KUNNR V KUNNR
LAND1 LAND1 GP
NAME1 NAME1 GP

The key attributes - set checkbox in column "key" - are MANDT and KUNNR.

iv) To how many other tables do foreign key relationships exist?

Quite a lot: 44.

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LFA1	Vendor Master (General Section)	
T000	Clients	
T001W	Plants/Branches	
T002	Language keys	
T005	Countries	
T005E	County	
T005G	City	
T005S	Taxes: Region (Province) Key	
1009	Fiscal year variants	
1016	Industries	
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TEPC	Industry Code (Customer Master)	
TOURC	Surrency Codec	
TEACD	Factory colendar definition	
TKIIKI	Customers: Customer Classifications	
TNLS	Nielsen ID	
TTXJ	Check Table for Tax Jurisdiction	
TVAST	Sales Document Blocking Reasons: Texts	
TVFS	Billing: Reasons for Blocking	
TVGF	Legal Status (Customer Master)	
TVKO	Attribute 10 (customer master)	
TVK1	Attribute 1 (customer master)	
TVK2	Attribute 2 (customer master)	
TVK3	Attribute 3 (customer master)	
1784	Attribute 4 (customer master)	
1765	Attribute 5 (customer master)	
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TVKO	Attribute 0 (customer mester)	
TYK66	Customer Condition Grouns (Customer Master)	
TVIS	Deliveries: Blocking Reasons/Criteria	
TVIV	Check table for release orders: Usage ID	
TWEK	IS-R Labeling: Check Table Customer/Plant Groups	
TZONE	Customers: Regional zones	
VBUK	Sales Document: Header Status and Administrative Data	

## Question 2

You realize, after having analyzed the system, that the banking services your company wants to provide, are not adequately supported by the system (at least, we assume that this is the case within our series of exercises). Hence, you have to extend your SAP R/3 system. The first step is to create a model of your banking application. This model is given in Figure 1 (in the well-known ER notation, not in SAP SERM). It consists of three entities: ZHPIxxCUST, ZHPIxxACC, and ZHPIxxENTR. In what follows, xx has to be replaced by the number of your SAP account. Note that cardinalities are given in the ERM-style which differs from the UML notation.



Figure 1: ER Model of your Banking Application

## I am registered in the system as DEVELOP30.

a) Create Data Model (Data Modeler)

The first step to your individual SAP R/3 extension is the creation of a new data model ZHPIxxMOD in the Data Modeler.

*Hint: Create the new data model ZHPIxxMOD and use within this data model for the three entities the names given above in the ER model, i.e., ZHPI18CUST for user develop18. Just create the entities – without further specifying the attributes. Consider the particular structural restrictions of SAP SERM when arranging the entities. Do also specify the relationships between the entities (Edit ! \rightarrow Connect) and their cardinalities.* 

Important Hint: Store all objects you are newly creating in your own development class ZHPIxx. A development class is a container for logically corresponding objects and strongly facilitates the access to all your objects. To each development class, a workbench request has to be specified. The first time you place a new object in your development class, you have to create such a request. From this point, you can re-use this request for all further objects you insert in the development class.

My new model ZHPI30MOD has been created in just a few seconds.



The next step, setting up the development class ZHPI30, caused no further riddles. Furthermore, I passed my ID to the initial request dialog which in turn generated a request ID.

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Object R3TR UDMO ZHP:	C30MOD					
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During the following minutes, I built all three entities and connected them (see second screenshot, the one with purple background).



b) Specification of Entities (Dictionary)

*i)* Obviously, customer data of the original SAP R/3 system should be re-used in your banking application. Hence, create a mapping from the entity type ZHPIxxCUST to a SAP view (in the graphical mode of the Data Modeler: choose entity and click on Dictionary). Define a projection view over table KNA1 for this purpose and name this view ZHPIxxCUST. At this point, you will need your developer key (just copy and paste from the list of developer keys). Choose some (few) attributes of KNA1 you want to include in this view, and make sure that the primary keys MANDT and KUNNR are also within this selection. Save and activate this view.

My view consists of seven attributes: MANDT, KUNNR, NAME1, NAME2, ORT01, STRAS and TELF1.

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Projection view	ZHPI30CUST New(Revised)				
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Basis table	KNA1				
	Table Galde				
View fields	rable fields				
Field name	Key Data element	M	DTyp	Length Short description	
MANDT	MANDT		CLNT	3 Client	
KUNNR	KUNNR		CHAR	18 Customer number	
NAME1	NAME1 GP		CHAR	35 Name 1	
NAME2	NAME2 GP		CHAR	35 Name 2	
ORT01	ORTO1 GP		CHAR	35 City	
STRAS	STRAS GP		CHAR	35 House number and street	
TELF1	TELF1		CHAR	16 First telephone number	
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*ii)* Create a mapping from entity type ZHPIxxACC to a table and define this table according to the ER model of Figure 1. Hint: Do not use the identifier proposed by the system for this table. Rather, use the name of the corresponding entity type (i.e., ZHPIxxACC).

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*iii)* Define the attributes of this table. Hint: The data elements for MANDT and KUNNR can be taken from the view ZHPIxxCUST (MANDT and KUNNR) you have just created. The data elements for the remaining attributes are already given (ZHPIACCTNO for the account number, ZHPIBAL for both balance and interest). In order to facilitate the import of data, you should stick to this order when defining the attributes.

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Short description	Accounts / Stephan Brumme			
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Fields	Key Init. Field type	Data Lgth.	Dec.p Check table	Short text 🛄
KUNNR		CHAR 10	0	Customer number
MANDT	MANDT	CLNT 3	0	Client 🔍
ACCTNO	ZHPIACCTNO	CHAR 10	0	
BALANCE	C ZHPIBAL	INT4 10	0	
INTEREST	C ZHPIBAL	INT4 10	0	
				4 7/1

**Assignment 2** 

*iv)* Specify the primary keys given in the ER model for table ZHPIxxACC.

See screenshot above.

v) Specify the foreign keys MANDT and KUNNR, which are dependent from the corresponding attributes of view ZHPIxxCUST.

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MANDT		$\checkmark$	MANDT	CLNT	3	0	ZHPI30CUST	Client
KUNNR	•	$\checkmark$	KUNNR	CHAR	10	0	ZHPI30CUST	Customer number
ACCTNO	•	$\checkmark$	ZHPIACCTNO	CHAR	10	0		
BALANCE			ZHPIBAL	INT4	10	0		
INTEREST			ZHPIBAL	INT4	10	0		
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vi) Save and activate (Table  $\rightarrow$  Activate) your account table1. Via (Table  $\rightarrow$  Check) you can figure out whether your table definition is consistent. Hint: When creating a table, make sure that you allow table maintenance (otherwise, data can only be modified by ABAP programs but not via the Data Browser). Indicate, in the technical settings, delivery class A and choose data class APPLO.

Table Edit Goto Utilit	ties Extras Environment System Help
Dictionary: Mainta	in Table
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Transparent table	ZHP130ACC New(Revised)
Short description	
Attributes Fields	Currency/quant fields
Last changed on/by	DEVELOP30 22.05.2003
Development class	
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Delivery class	A
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vii) Do the same for the account entries table (ZHPIxxENTR). Hint: Again, do not use the suggested name but use ZHPIxxENTR. The data elements for MANDT, KUNNR, and ACCTNO can be taken from ZHPIxxACC. The data elements for the remaining attributes are also predefined (ZHPIENTR for EntryID, ZHPIAMOUNT for amount, ZHPIDATE for Created, and ZHPIOFF for Officer). Create these attributes in this order.

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Transparent table		ZH	PI30ENTR Active						
Short description		En	tries / Stphan Brumme						
Attributes Field	IS N	C ew r	urrency/quant.fields ows	Data	element/	Direct ty	pe		
Fields	Key	Init.	Field type	Data	. Lgth.	Dec.p	Check table	Short text	<b></b>
MANDT			MANDT	CLNT	3	0	ZHP130ACC	Client	
KUNNR		1	KUNNR	CHAR	10	0	ZHP130ACC	Customer number	•
ACCTNO	•	1	ZHPIACCTNO	CHAR	10	0	ZHP130ACC		
ENTRYID	◄	1	ZHPIENTR	CHAR	10	0			
AMOUNT			ZHPIAMOUNT	INT4	10	0			
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OFFICER			ZHPIOFF	CHAR	20	0			
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viii) Specify the foreign key relationships implicitly included in the model for ZHPIxxENTR. Do also specify the primary keys.

Because I just had to redo the same steps that I took for ZHPI30ACC, I present only a single screenshot (the one above). It covers ix) as well.

*ix)* Save and activate the account entry table.

See the screenshot above.

c) Fill the new Tables with Data (Execution of an ABAP Program). Usually, when introducing SAP R/3, legacy applications are replaced and data from these applications has to be loaded into SAP R/3. Similarly, we assume that the required data already exists (but in some other table). Hence, you have to copy this data into your new tables. A nice colleague of yours has already implemented such an ABAP program named ZBANKCOPY. Take a look at this program in the ABAP editor (you do not have to modify anything here; we will start with ABAP programming in the next exercise) and execute the program (just press F8). You have just to indicate the name of your newly generated tables: specify ZHPIxxACC as "ACC TAB" and ZHPIxxENTR as "ENTR TAB".

I immediately found the ABAP program. Entering the appropriate table names filled them with many tuples.



d) Extend Contents of Tables (Data Browser) Take a look at the data of your tables by using the Data Browser (in the Dictionary: Utilities → Table Contents → Display). Modify some of the tuples or add new tuples (in the Dictionary: Utilities → Table Contents → Create Entries). With this occasion, you can also check whether the system guarantees referential integrity.

I added a new account (no. 271278) owned by me with a balance of 150 and an interest rate of 7%.

