iu INTERNATIONALE HOCHSCHULE

PORTFOLIO

Assignments for the course: Build a Data Mart in SQL (DLBDSPBDM01)

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1. TOPICS AND TASKS

Within the framework of this course, the following topic must be selected.

1.1. Task: A Use-Case of booking a hotel room: Airbnb

Databases are becoming more and more important nowadays. Within this section you will find a description for your tasks regarding the definition and creation of a database for renting apartments and bedrooms. You know this use case from Airbnb. According to the company's founding legend, the idea was born in October 2007, based on personal experience with an overpriced shared apartment and fully booked hotels due to a well-attended conference in San Francisco. The original name Airbedandbreakfast was shortened to Airbnb in 2009. As an online platform, the company establishes the contact between host and guest and is solely responsible for handling the booking. The transaction takes place via the platform. The guest pays the amount for his booking by credit card to Airbnb. The host is not paid until 24 hours after arrival to ensure that the guest finds the accommodation as it is described on the platform. In 2013, Airbnb earned 6-12% commission from guests, 3% from hosts and a total of $150 million from about 10 million overnight stays. Further Details can be found on www.Airbnb.com.

Each user, i.e. host and guest, presents himself on Airbnb with a profile page. Hosts have to upload at least one picture and enter a phone number. Guests have to provide even more information. Hosts can describe their accommodation textually and by using photos. Guest and host can rate each other. Using the platform's calculator function, you can calculate the expected income with your own accommodation. Since 2011 it is possible to connect your profile with social networks like Facebook. This enables the display of an Airbnb user's ratings through social contacts.

Within the framework of this course, you have to build and document an appropriate database including data, which is self-developed regarding the data model you build.

The task: You have to build a database for storing and processing information regarding the Airbnb use case. Therefore, the first step is to develop an entity relationship model (ERM), which describes the single data tables with its attributes and the relations between these entities. This ERM is the basis for developing a database with a state-of-the-art database management system (e. g.: https://www.mysql.com/). You are free to choose every database management system which uses SQL as a basic language. Define a database structure and certain reasonable dummy data by yourself, to ensure an appropriate usage of the database and some feasible queries to present the results in a document. Please ensure that every step and written SQL Statement is being documented as described in the implementation phase. Furthermore, the database has to be normalized in an appropriate way to ensure only necessary data storage.

Make sure that you have filled up your database with appropriate dummy data, to ensure testing and results are showing up. Use reasonable data of your own choice.

Your database management system needs to be built, documented and delivered according to the following three phases:

1.1.1. Conception phase

This part of the database design process is called database modelling and represents the most important part of the database design. Anything that is overlooked or forgotten in this phase has a negative effect on the implementation later and will lead, in the worst case, to a useless database.

The first step is to **create a requirements specification** for your project Airbnb. The specification document must contain a requirements analysis, which addresses the following aspects in more detail:

- o   What roles (person/user groups) are there?
- o   What actions do these roles perform?
- o   Which data and functions are required?

The requirements specification should **not exceed two pages in 12-point font.**

In addition to the specification document, **create an Entity Relationship Model (ERM)**. Create a meaningful ER-Model from your requirements specification. The requirements for the ER-Model are:

- o   The model should contain at least 20 entities.
- o   The model should contain 2-3 triple relationships (Join over three tables.).
- o   The model may also contain recursive relationships. Assign suitable attributes to the entities and mark the key attributes.
- o   Specify all cardinality specifications in a notation of your choice (e. g. Chen notation)
- o   Short description of your current attributes in a data dictionary (short description of the data attributes and data types are appropriate).

Remember that your ER model must be consistent with the roles, actions and data described in the requirements specification.

Please also provide **a half-page description** (summary or abstract) **of your work and the single working steps within this phase**. A brief description of the existing problem, your solution approaches regarding the database development.

Throughout the process, online tutorials are offered, and they provide an opportunity to talk, share ideas and/or drafts, and obtain feedback. In the online tutorials, exemplary work can be discussed with the tutor. Here, every-one has the opportunity to get involved and learn from each other's feedback. **It is recommended to make use of these channels to avoid errors and to make improvements.** You should only submit work after making use of the above-mentioned tutorial and informative media. This will be followed by a feedback from the tutor and the work on the second phase can begin.

1.1.2.   Development phase/reflection phase

Within this phase you will start to **implement your own database management system for the Airbnb Use Case**. Please ensure, that every SQL-Statement is written down in your database file and is well documented.

- o   Ensure that you deliver tables and relations for the database in a sql-datafile as you outline the concept in your ER-Diagram
- o   Document every SQL-Statement regarding the creation process
- o   Ensure that every table has at least a minimum of 20 entries
- o   To test your first development, ensure that you have at least one test case for your database regarding the ER-Model

In this phase you must submit an **explanation of your database design and implementation procedure as a composite presentation PDF with at least 20 slides** (regarding you ER model). The slides should contain the documentation of the sql-statements (for each Entity one slide) with the corresponding test case (sql-statement)

and a screenshot of the result shown in the database management system. Please also provide **a brief summary of the implementation (approx. 1/2 page).**

Throughout the process, online tutorials and other channels provide the opportunity to profoundly discuss ideas and/or drafts and to get sufficient feedback, tips, and hints. **It is recommended to use these channels to avoid errors and to improve your work.** Once this is done, you can hand in your second phase for evaluation. Following a feedback from the tutor, your work on the final draft will continue in the third phase.

1.1.3. Finalization phase

In this final phase, your goal is to **polish and refine your database management system**, after having received feedback from the tutor, and prepare it for final submission. Certain elements may have to be improved or changed to finalize the task and complete this portfolio course.

In a final step you write a **2-page abstract PDF document** in which you highlight and describe your database management functionality and also provide metadata stored in the system: number of tables and corresponding entries and the size of the database regarding its volume.

You have finished your product (database system for Airbnb) once you have delivered all the files, SQL-files (including documentation and installation manual) and presentations as a **single ZIP-File and put it into a folder**. You have to **zip this folder and insert it in your submission in PebblePad**. In addition, provide a **pdf-document with all results from each phase including the slides and screenshots** you have made during the three phases and upload the file into PebblePad.

In the "Finalization phase", the online tutorials and other channels also provide the opportunity to obtain sufficient feedback, tips, and hints before the finished product is finally handed in. **It is recommended to use these channels to avoid errors and to make improvements.** The finished product is submitted with the results from Phase 1 and Phase 2 and together with the materials mentioned above. Following the submission of the third portfolio page, the tutor submits the final feedback which includes evaluation and scoring within six weeks.

2. TUTORIAL SUPPORT

In principle, several channels are open to attain feedback for the portfolios. The respective use is the sole responsibility of the user. The independent development of a product and the work on the respective portfolio parts is part of the examination performance and is included in the overall assessment.

On the one hand, the tutorial support provides feedback loops on the portfolio parts to be submitted in the context of the conception phase as well as the development and reflection phase. The feedback takes place within the framework of a submission of the respective part of the portfolio. In addition, regular online tutorials are offered. These provide you with an opportunity to ask any questions regarding the processing of the portfolio and to discuss other issues with the tutor. The tutor is also available for technical consultations as well as for formal and general questions regarding the procedure for portfolio management.

Technical questions regarding the use of "PebblePad" should be directed to the exam office via mail.

3. EVALUATION

The following criteria are used to evaluate the portfolio with the percentage indicated in each case:

Evaluation criteria	Explanation	Weighting
Problem Solving Techniques	*Capturing the problem *Clear problem definition/objective *Understandable concept	10%
Methodology/Ideas/Procedure	*Appropriate transfer of theories/models *Clear information about the chosen Methodology/Idea/Procedure	20%
Quality of implementation	*Quality of implementation and documentation	40%
Creativity/Correctness	*Creativity of the solution approach *Solution implemented fulfils intended objective	20%
Formal requirements	* Compliance with formal requirements	10%

The design and construction of the portfolio should take into account the above evaluation criteria, including the following explanations:

Problem Solving Techniques: According to the problem of creating a database in the context of Airbnb, you should be able to design and implement a database with a clear documentation as a technical basis for application development and data organisation.

Methodology/idea/procedure: According to the database design, you should be able to transfer a practical problem regarding the usage of a common modelling language like ER-Modelling into a technical representation of data within a database. The idea is to generate an entity relationship model in a first step as a starting point for discussions and improvements. Afterwards the documented ER-Model is used as a starting point for the actual implementation. Describe and also explain why you choose a specific entity and justify this with the criteria of the portfolio course.

Quality of implementation: A clear concept of the implementation and the possible operation of it by a user who is not familiar with the project will be evaluated. The possibility of creating the database with your SQL definitions in another database management system and the consistency of the results are also included in the evaluation.

Creativity/Rightness: It is evaluated whether the specific requirements have been understood and implemented in a comprehensible and innovative way. The basic functionality of the database must be covered by showing and describing the results of your queries.

Formal requirements: The submission follows the acceptance criteria from Chapter 1 and the formal guidelines following in the next chapter. It is particularly important to respect the formal submission requirements outlined in Chapter 4.

4. FORMAL GUIDELINES AND SPECIFICATIONS FOR SUBMISSION

4.1. Components of the examination performance

The following is an overview of the examination performance portfolio with its individual phases, individual performances to be submitted, and feedback stages at one glance. A template in "PebblePad" is provided for the development of the portfolio parts within the scope of the examination performance. The presentation is part of this examination.

Stage	Intermediate result	Performance to be submitted
Conception phase	Portfolio part 1	• ½ page summary of the existing problem, your solution approaches regarding the database development for the text field in PebblePad • Two-page concept in written form, additionally a comprehensive ER-Model within one pdf-document.
		Feedback
Development phase/ reflection phase	Portfolio part 2	• ½ page summary for the text field in PebblePad • Explanation of implementation in written form as a composite presentation PDF with about 20 slides; incl. Screenshots of results and SQL-Statements.
		Feedback
Finalization phase	Portfolio part 3	• 2-page abstract (making of) • Final product (SQL-scripts with installation data insert queries documentation included) • One pdf-document with all information and content (incl. screenshots) of all three phases • Upload a zip folder (incl. all files) • Result from phase 1 • Result from phase 2
		Feedback + Grade

4.2. Format for Digital File Submission

Conception phase

Recommended tools/software for processing	• Word or LaTex (pdf-File for submission) • Tools to draw ER-Models (e. g. Visio, SmartDraw, Edraw) • Relevant sources in digital forms
Permitted file formats	PDF
File size	as small as possible
Further formalities and parameters	Files must always be named according to the following pattern: **For the performance-relevant submissions on "PebblePad":** Name-FirstName_MatrNo_Course_P(hase)-1_S(ubmission) Example: Mustermann-Max_12345678_ DLBDSPBDM01_P1_S

Development/reflection phase

Recommended tools/software for processing	• PowerPoint or LaTex (pdf-File for submission) • SQL data files (.sql-Data) • Relevant sources in digital forms
Permitted file formats	PDF and (.sql-Files)
File size	as small as possible
Further formalities and parameters	Files must always be named according to the following pattern: **For the performance-relevant submissions on "PebblePad":** Name-FirstName_MatrNo_Course_P(hase)-2_S(ubmission) Example: Mustermann-Max_12345678_ DLBDSPBDM01_P2_S

Finalization phase

Recommended tools/software for processing	• Word or LaTex (pdf-File for submission) • Relevant sources in digital forms
Permitted file formats	• PebblePad: PDF • Zip folder: various file formats for submissions from all three phases. The code (.sql-files) must be inserted in the folder by creating a ZIP file from all the files.
File size	• PebblePad: Max. 25MB • Zip folder: Max. 150 MB
Further formalities and parameters	**IMPORTANT** is the upload of the zip folder that has been created especially for the submission (please follow the instructions on myCampus). This folder contains all the files you used to complete the task. To ensure a better overview, please create subdirectories for this purpose. **The folder structure then looks like this:** ○ Main directory (name of the zip folder) -> Name: *Last_Name-First_Name_Matriculation_Course* ○ Subdirectory -> Name: 01-Concept ○ Subdirectory -> Name: 02-Development ○ Subdirectory -> Name: 03-Finalisation In phase 3 you should also upload a zipped version (ZIP file with all program code) to a zip folder with the following naming convention: Name-First-Name_MatrNo_Course_Topic_Submission_Code.zip Example: Mustermann-Max_12345678_DLBDSPBDM01_Data_Mart_Submission_all.zip Files must always be named according to the following pattern: **For the performance-relevant submissions on "PebblePad":** Name-FirstName_MatrNo_ Course _P(hase)-3_S(ubmission) Example: Mustermann-Max_12345678_ DLBDSPBDM01_P3_S

4.3. Format of Abstract

Length	2 pages of text
Paper size	DIN A4
Margins	Top and bottom 2cm; left 2cm; right 2cm
Font	General Text - Arial 11 pt.; Headings - 12 pt., Justify
Line Spacing	1,5
Sentences	Justified; hyphenation
Footnotes	Arial 10 pt., Justify
Paragraphs	According to mental structure - 6 pt. after line break
Affidavit	The affidavit shall be made in electronic form via "myCampus". No submission of the examination performance is possible before it.
	Please follow the instructions for submitting a portfolio on "myCampus".

If you have any questions regarding the submission of the portfolio, please contact the exam office via mail.

Please also note the instructions for using PebblePad & Atlas!

Good luck creating your portfolio!