Technische Hochschule Ulm
University of Applied Sciences

Data Warehousing Laboratory Project following the CRISP-DM through the example
# of soccer statistics

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Structure

1. Introduction
2. CRISP-DM
3. Concept of the problem
4. Data Preparation
    1. Solution approach
    2. Implementation steps
5. Conclusion
6. References

Introduction

- Football is the most popular sport on this planet and games from previous seasons are compared to follow the development
- Our task was to enable useful information out of the huge amount of data
- We solved this task through following the CRISP-DM process.

CRISP-DM

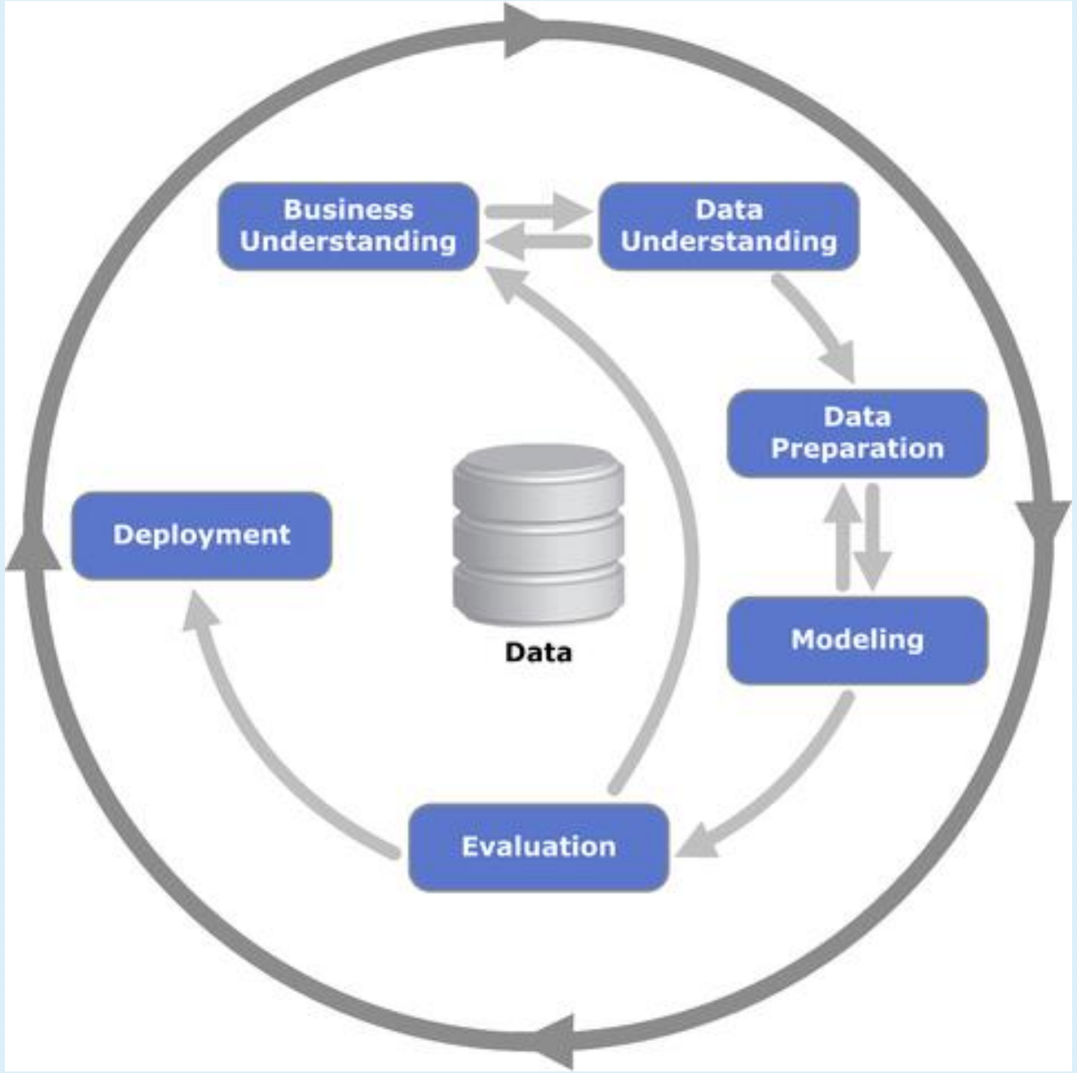


Figure 1: Crisp-DM model
https://statistik-dresden.de/archives/1128

Business Understanding Phase

Our topic: Soccer statistics about the Bundesliga in Germany

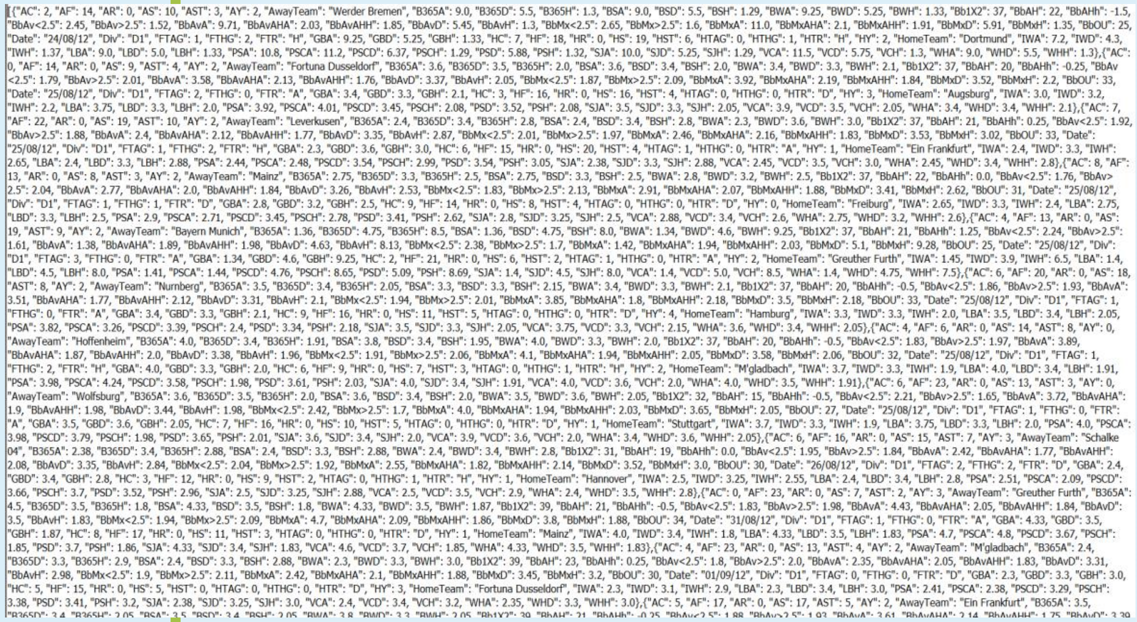
Our goal: Understand the Performance development of a team

Data Understanding Phase

Source

Open Data: http://www.football-data.co.uk/

- Contains data for last 10 seasons of German Bundesliga including current season
- Contains various statistical data
- Each season in a separate file



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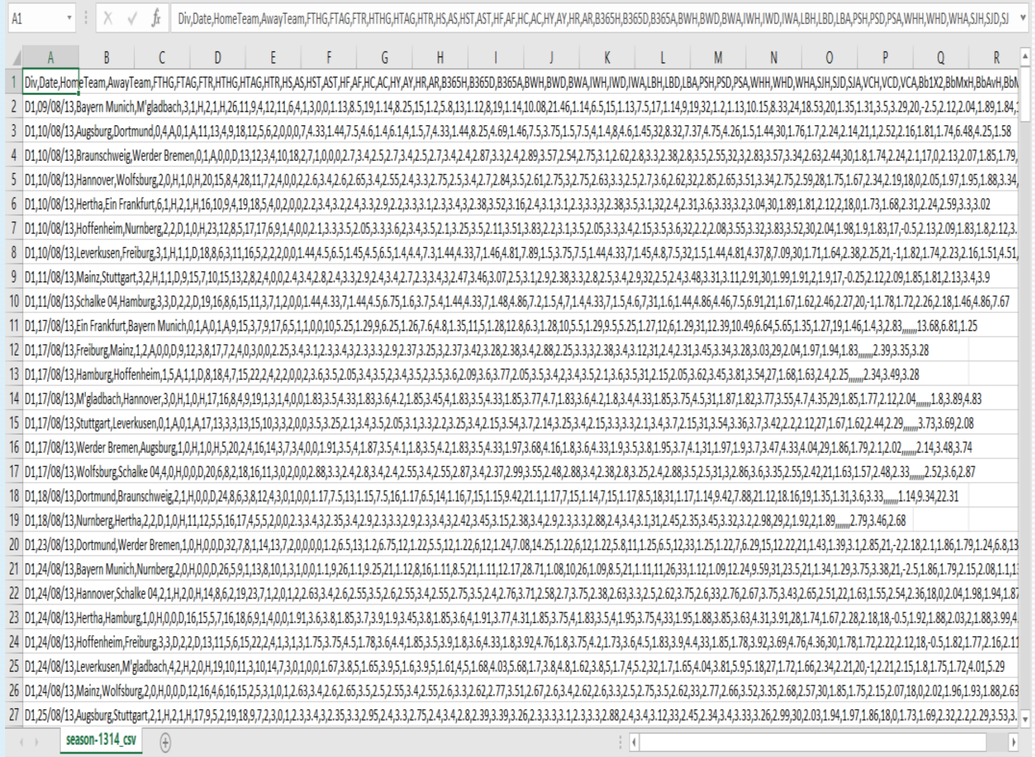

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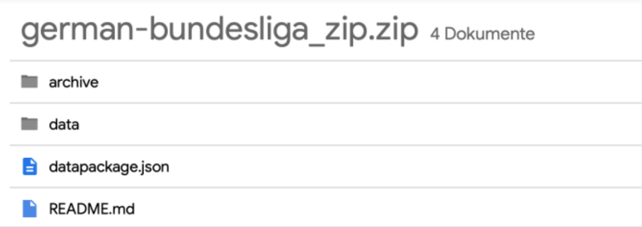
```

Necessary tools:

- Latex → perform analytic report
- Microsoft Excel → convert to CSV-files
- PhpMyAdmin → build new database
- MySQL Workbench → design and build DWH/ DM

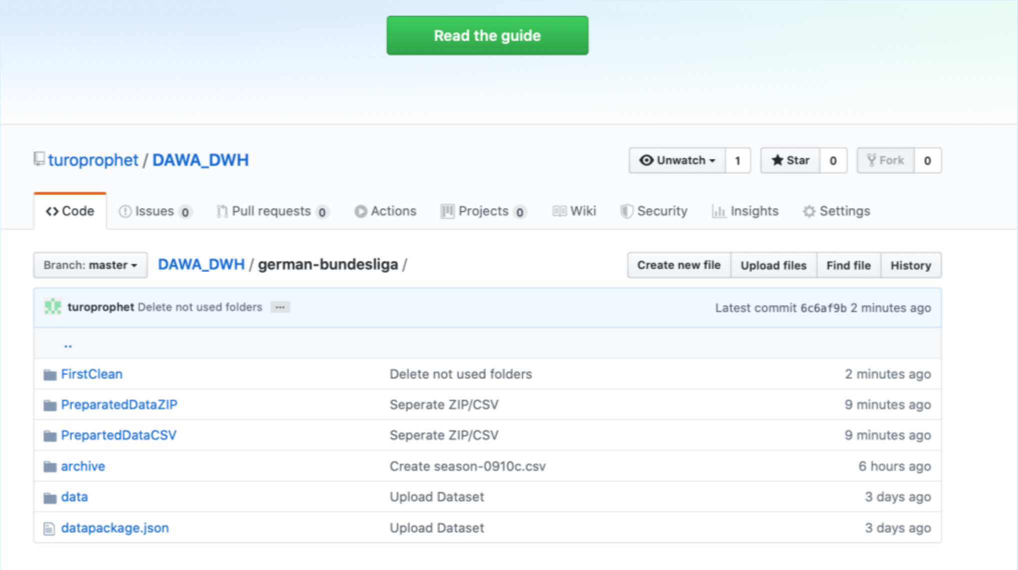
GitHub

- Source code management
- Repository
- Work efficently in our team



german-bundesliga_zip.zip 4 Dokumente

- archive
- data
- datapackage.json
- README.md



turoprophet / DAWA_DWH

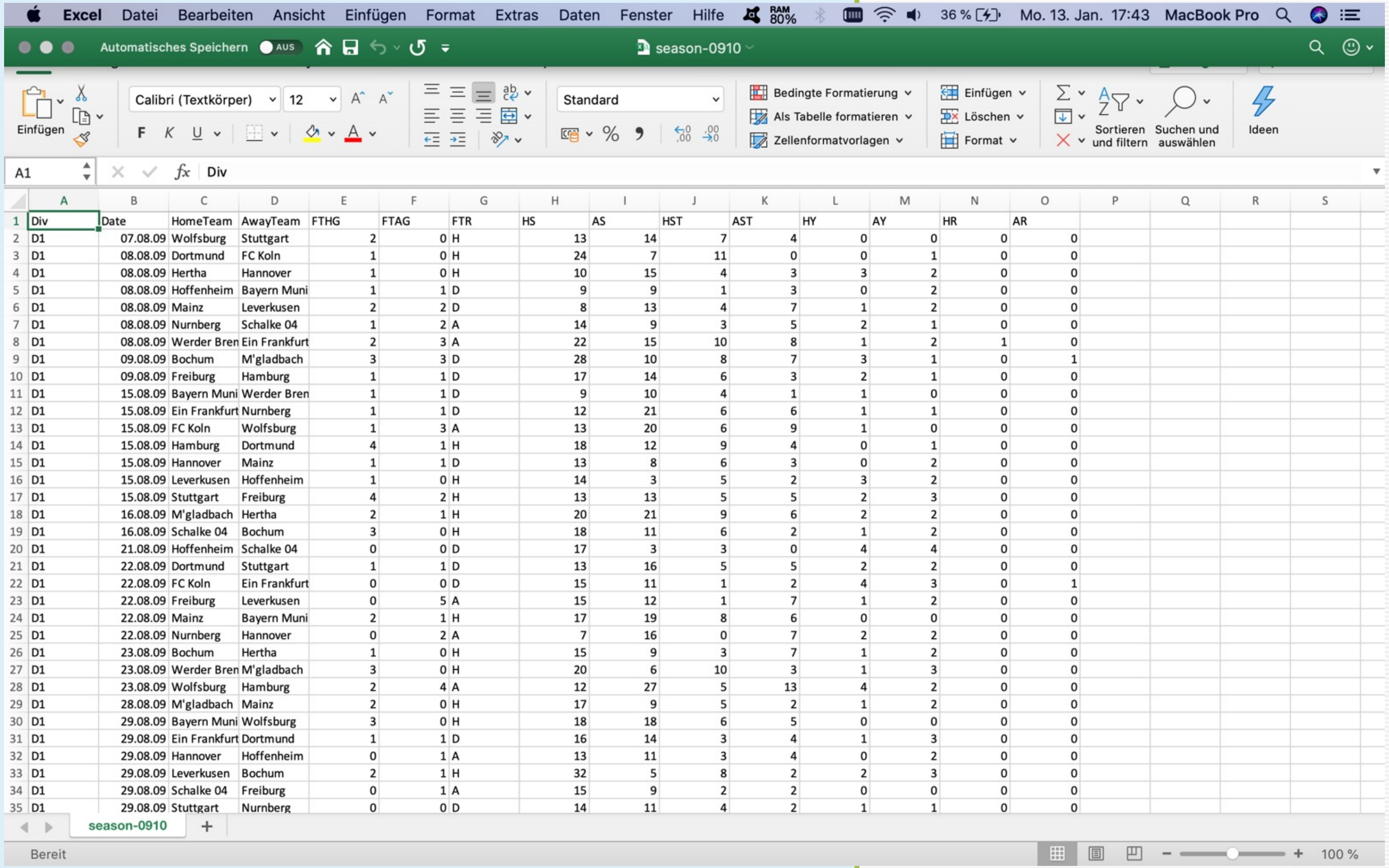
DAWA_DWH / german-bundesliga /

turoprophet Delete not used folders … Latest commit 6c6af9b 2 minutes ago

..		
FirstClean	Delete not used folders	2 minutes ago
PreparatedDataZIP	Seperate ZIP/CSV	9 minutes ago
PrepartedDataCSV	Seperate ZIP/CSV	9 minutes ago
archive	Create season-0910c.csv	6 hours ago
data	Upload Dataset	3 days ago
datapackage.json	Upload Dataset	3 days ago

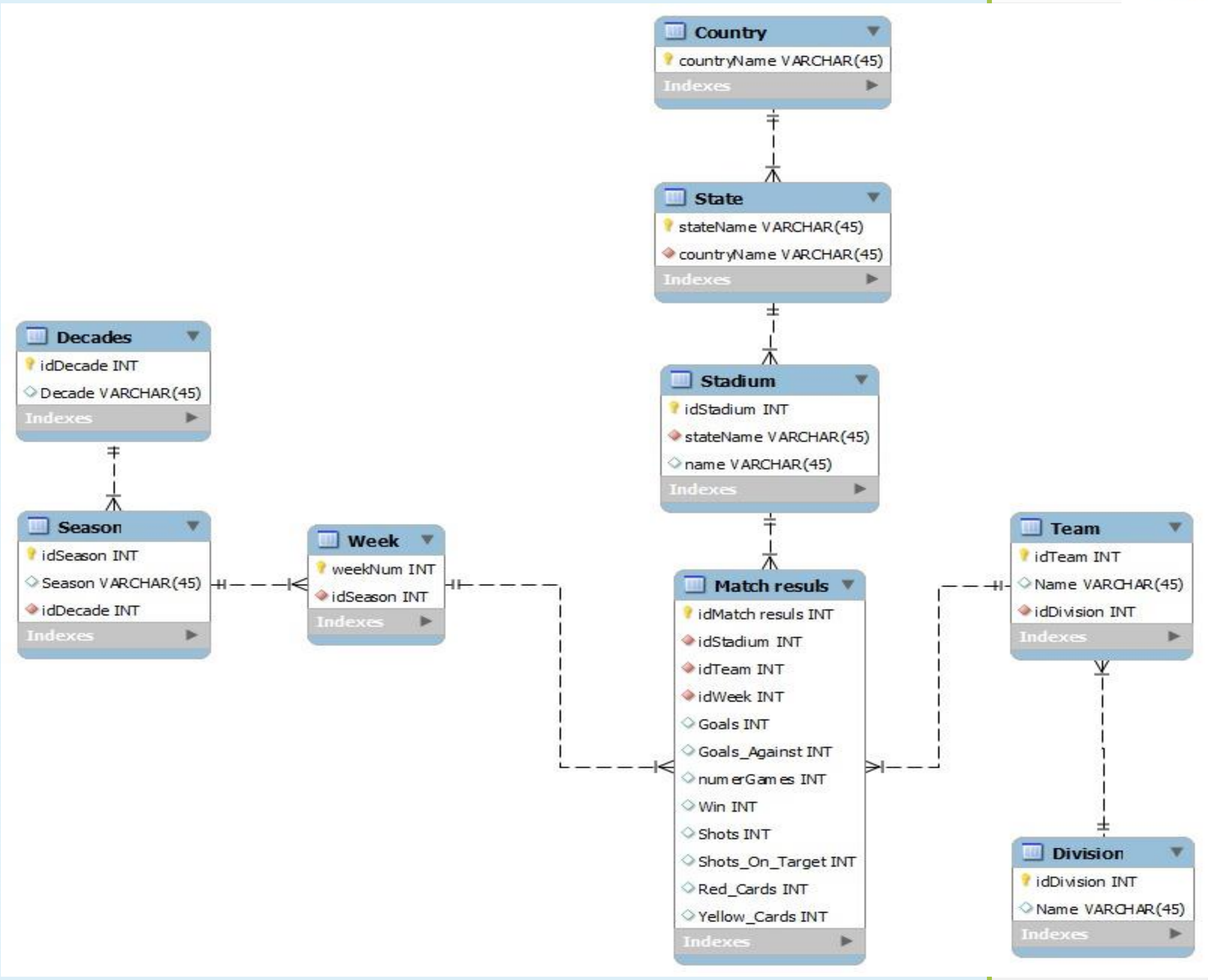
Data Preparation Phase

- Data Preparation
- Cleansing
- Compress CSV in ZIP
- Upload all Seasons (csv.zip)



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Div	Date	HomeTeam	AwayTeam	FTHG	FTAG	FTR	HS	AS	HST	AST	HY	AY	HR	AR
2	D1	07.08.09	Wolfsburg	Stuttgart	2	0	H	13	14	7	4	0	0	0	0
3	D1	08.08.09	Dortmund	FC Koln	1	0	H	24	7	11	0	0	1	0	0
4	D1	08.08.09	Hertha	Hannover	1	0	H	10	15	4	3	3	2	0	0
5	D1	08.08.09	Hoffenheim	Bayern Muni	1	1	D	9	9	1	3	0	2	0	0
6	D1	08.08.09	Mainz	Leverkusen	2	2	D	8	13	4	7	1	2	0	0
7	D1	08.08.09	Nurnberg	Schalke 04	1	2	A	14	9	3	5	2	1	0	0
8	D1	08.08.09	Werder Bren	Ein Frankfurt	2	3	A	22	15	10	8	1	2	1	0
9	D1	09.08.09	Bochum	M'gladbach	3	3	D	28	10	8	7	3	1	0	1
10	D1	09.08.09	Freiburg	Hamburg	1	1	D	17	14	6	3	2	1	0	0
11	D1	15.08.09	Bayern Muni	Werder Bren	1	1	D	9	10	4	1	1	0	0	0
12	D1	15.08.09	Ein Frankfurt	Nurnberg	1	1	D	12	21	6	6	1	1	0	0
13	D1	15.08.09	FC Koln	Wolfsburg	1	3	A	13	20	6	9	1	0	0	0
14	D1	15.08.09	Hamburg	Dortmund	4	1	H	18	12	9	4	0	1	0	0
15	D1	15.08.09	Hannover	Mainz	1	1	D	13	8	6	3	0	2	0	0
16	D1	15.08.09	Leverkusen	Hoffenheim	1	0	H	14	3	5	2	3	2	0	0
17	D1	15.08.09	Stuttgart	Freiburg	4	2	H	13	13	5	5	2	3	0	0
18	D1	16.08.09	M'gladbach	Hertha	2	1	H	20	21	9	6	2	2	0	0
19	D1	16.08.09	Schalke 04	Bochum	3	0	H	18	11	6	2	1	2	0	0
20	D1	21.08.09	Hoffenheim	Schalke 04	0	0	D	17	3	3	0	4	4	0	0
21	D1	22.08.09	Dortmund	Stuttgart	1	1	D	13	16	5	5	2	2	0	0
22	D1	22.08.09	FC Koln	Ein Frankfurt	0	0	D	15	11	1	2	4	3	0	1
23	D1	22.08.09	Freiburg	Leverkusen	0	5	A	15	12	1	7	1	2	0	0
24	D1	22.08.09	Mainz	Bayern Muni	2	1	H	17	19	8	6	0	0	0	0
25	D1	22.08.09	Nurnberg	Hannover	0	2	A	7	16	0	7	2	2	0	0
26	D1	23.08.09	Bochum	Hertha	1	0	H	15	9	3	7	1	2	0	0
27	D1	23.08.09	Werder Bren	M'gladbach	3	0	H	20	6	10	3	1	3	0	0
28	D1	23.08.09	Wolfsburg	Hamburg	2	4	A	12	27	5	13	4	2	0	0
29	D1	28.08.09	M'gladbach	Mainz	2	0	H	17	9	5	2	1	2	0	0
30	D1	29.08.09	Bayern Muni	Wolfsburg	3	0	H	18	18	6	5	0	0	0	0
31	D1	29.08.09	Ein Frankfurt	Dortmund	1	1	D	16	14	3	4	1	3	0	0
32	D1	29.08.09	Hannover	Hoffenheim	0	1	A	13	11	3	4	0	2	0	0
33	D1	29.08.09	Leverkusen	Bochum	2	1	H	32	5	8	2	2	3	0	0
34	D1	29.08.09	Schalke 04	Freiburg	0	1	A	15	9	2	2	0	0	0	0
35	D1	29.08.09	Stuttgart	Nurnberg	0	0	D	14	11	4	2	1	1	0	0

Star Schema



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Indexes

State
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Indexes

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Indexes

Decades
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Season
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Season VARCHAR(45)
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Week
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Match resuls
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Win INT
Shots INT
Shots_On_Target INT
Red_Cards INT
Yellow_Cards INT
Indexes

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idDivision INT
Indexes

Division
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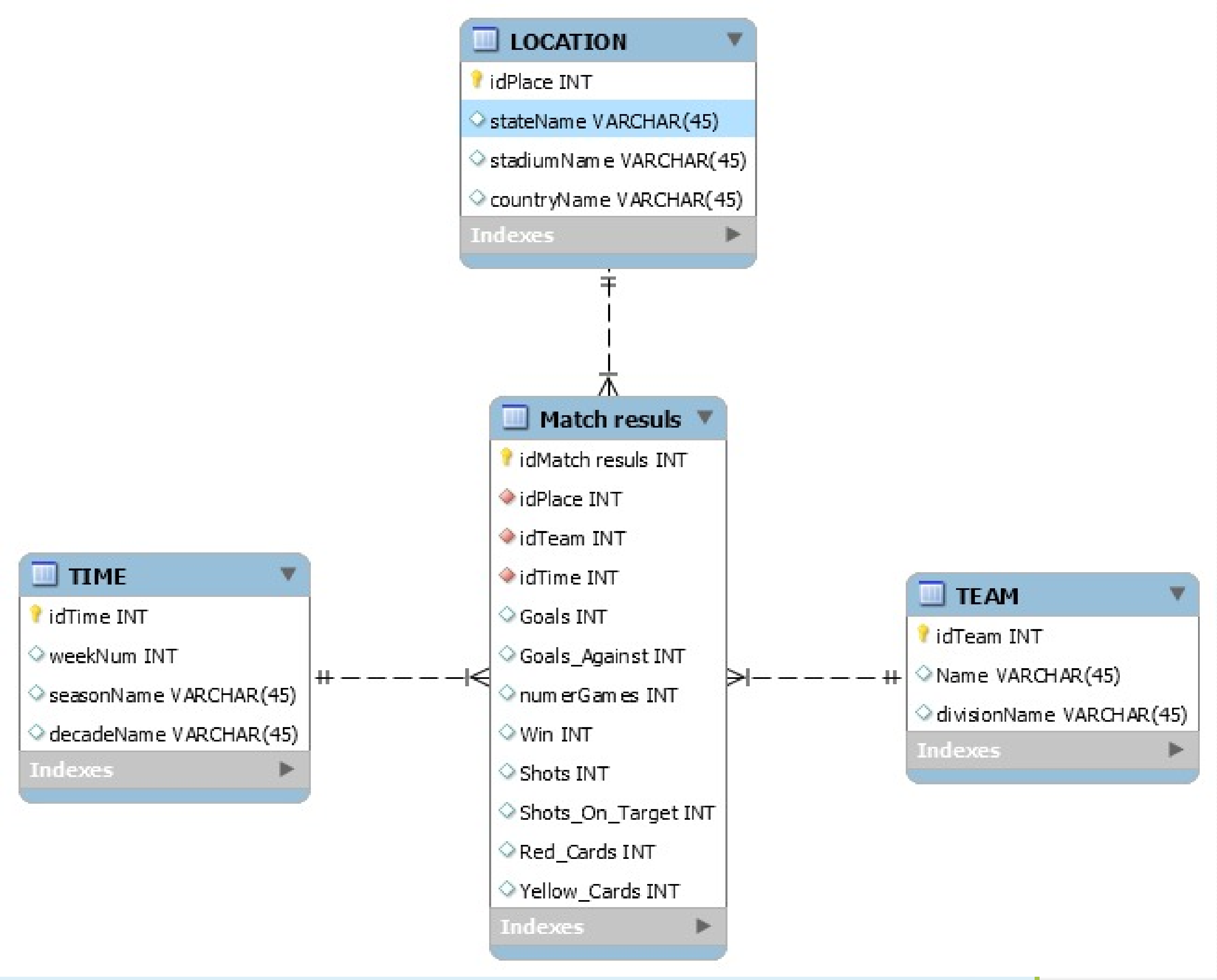
Name VARCHAR(45)
Indexes

Figure 2: Star Schema

Data Mart



LOCATION
idPlace INT
stateName VARCHAR(45)
stadiumNam e VARCHAR(45)
countryName VARCHAR(45)

Match resuls
idMatch resuls INT
idPlace INT
idTeam INT
idTime INT
Goals INT
Goals_Against INT
num erGam es INT
Win INT
Shots INT
Shots_On_Target INT
Red_Cards INT
Yellow_Cards INT

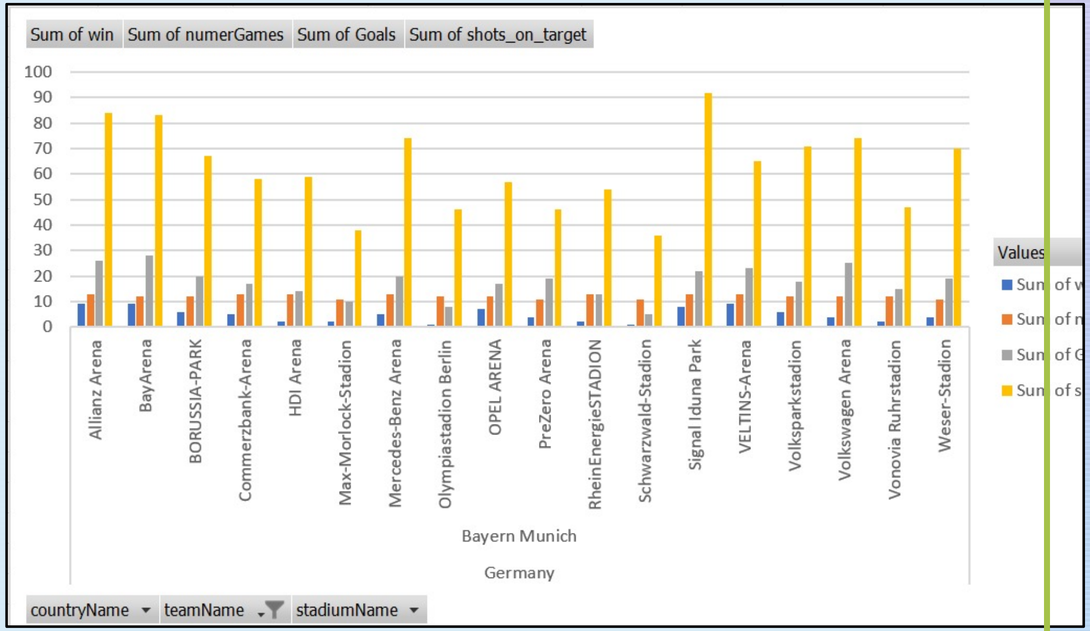
TIME
idTime INT
weekNum INT
seasonName VARCHAR(45)
decadeName VARCHAR(45)

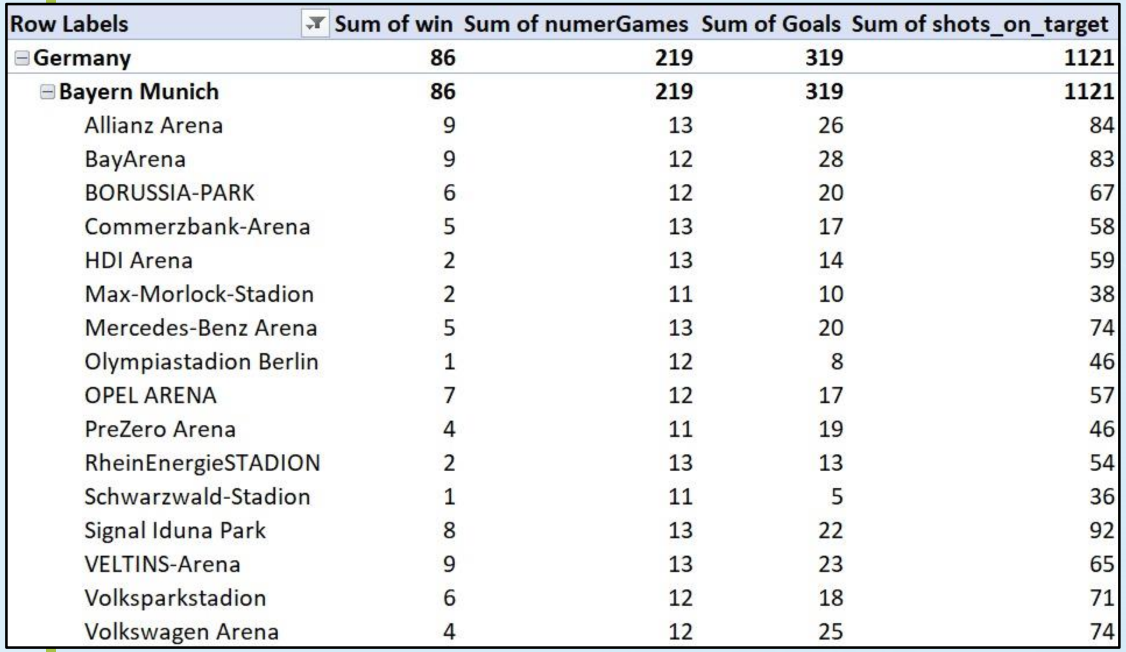
TEAM
idTeam INT
Name VARCHAR(45)
divisionName VARCHAR(45)

Figure 3: Data Mart

Bayern Munich

- Performance of BM depending on the stadium





Row Labels	Sum of win	Sum of numerGames	Sum of Goals	Sum of shots_on_target
⊟ Germany	**86**	**219**	**319**	**1121**
⊟ Bayern Munich	**86**	**219**	**319**	**1121**
Allianz Arena	9	13	26	84
BayArena	9	12	28	83
BORUSSIA-PARK	6	12	20	67
Commerzbank-Arena	5	13	17	58
HDI Arena	2	13	14	59
Max-Morlock-Stadion	2	11	10	38
Mercedes-Benz Arena	5	13	20	74
Olympiastadion Berlin	1	12	8	46
OPEL ARENA	7	12	17	57
PreZero Arena	4	11	19	46
RheinEnergieSTADION	2	13	13	54
Schwarzwald-Stadion	1	11	5	36
Signal Iduna Park	8	13	22	92
VELTINS-Arena	9	13	23	65
Volksparkstadion	6	12	18	71
Volkswagen Arena	4	12	25	74

Conclusion

- Raw data is used to create a Data Warehouse
- Check the data quality and reduced to the relevance data
- Easy and compact information about the football statics
- Good a new experience for the group

Thank you...