

МИНЦИФРЫ  
ФГБОУ ВО СибГУТИ

Кафедра прикладной математики и кибернетики

Расчетно-графическая работа.

Вариант 1.

Выполнил: студент 2 курса группы ИП-017

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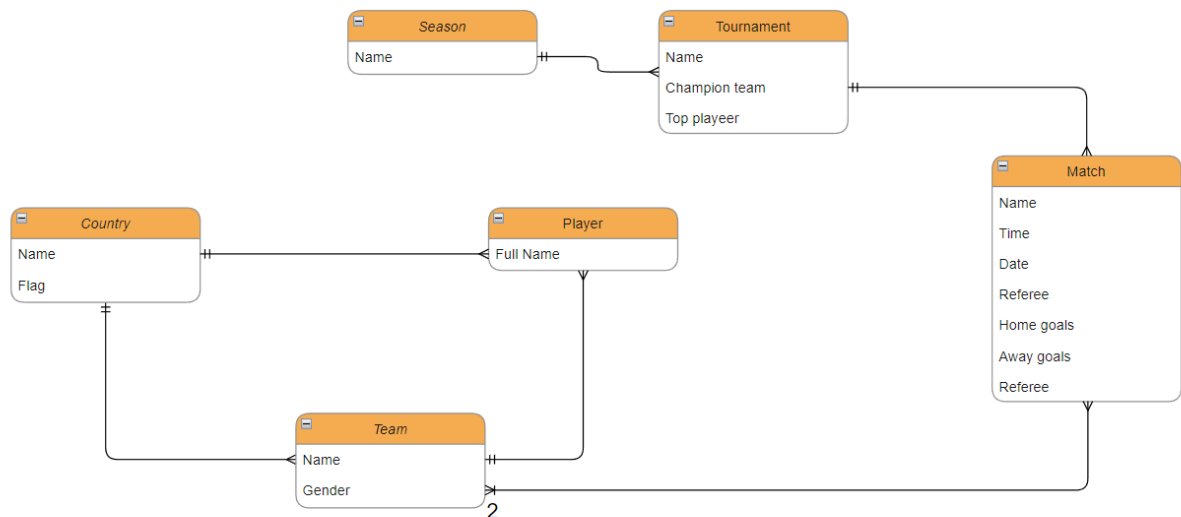
*Новосибирск, 2022*

## Оглавление

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# 1. Исследование предметной области и создание ER диаграммы

Есть сущность турнир. Он состоит из Матчей. Каждый матч играется двумя командами (домашняя и гостевая). Также в каждом матче есть состав игроков. И каждый такой игрок обладает статистикой за матч. Исходя из статистики Игрок-Матч можно узнать статистику Игрок-Сезон и Команда-Сезон. Каждый турнир проходит в какой-либо стране, и каждый игрок из какой-то страны (при этом страна игрока и страна турнира могут отличаться)



После изучения источников информации была составлена ER диаграмма, в которой отображены 6 сущностей:

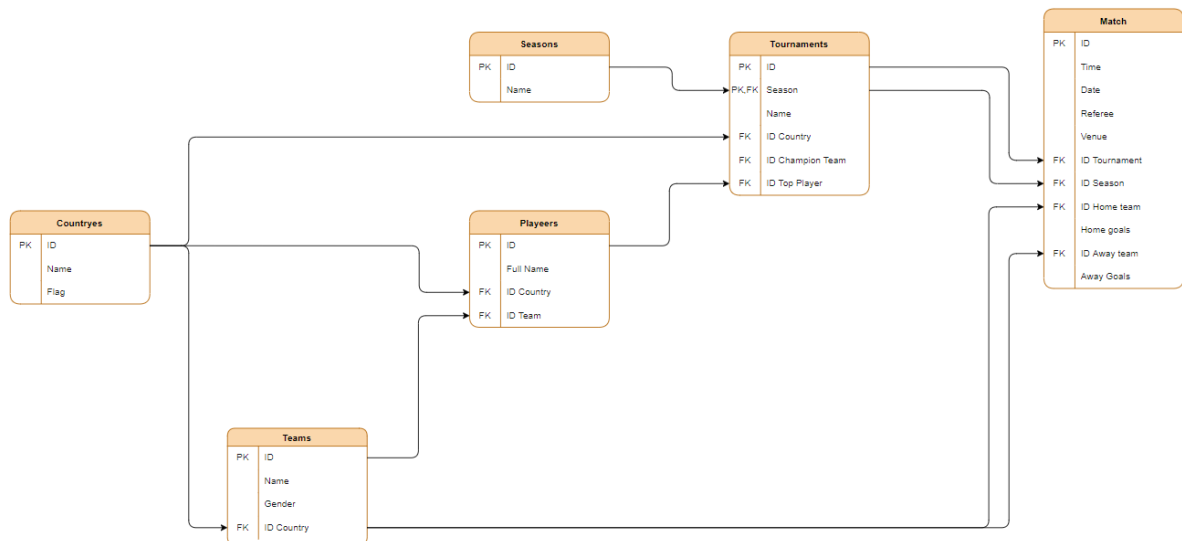
- Country
- Team
- Match
- Player
- Tournament
- Season

В этой диаграмме отображены следующие связи:

- Player – Country, многие к одному, игрок из одной страны, в стране могут родиться много игроков.
- Player – Team, многие к одному, игрок из одной команды, в команде много игроков.

- Country – Team, многие к одному, команда из одной страны, в стране основано много команд.
- Stats player in match – Player, многие к одному, статистика записана за определённого игрока, игрок может иметь несколько статистик.
- Team – Match, многие к двум, матч играется двумя командами, команда может сыграть множество матчей.
- Match – Tournament, многие к одному, матч проводится в одном турнире, в турнире проходит много матчей
- Tournament – Season, турнир проходит в один сезон, в сезоне проходят множества турниров

## 2. Перевод ER диаграммы в реляционную модель, создание и заполнение БД



- Countries
  - ID – Первичный ключ
- Teams
  - ID – Первичный ключ
  - ID Country – Внешний ключ
- Players
  - ID – Первичный ключ
  - ID Country – Внешний ключ
  - ID Team – Внешний ключ
- Seasons
  - ID – Первичный ключ
- Tournaments
  - ID Season + ID – Первичный ключ
  - ID Season – Внешний ключ
- Matches
  - ID – Первичный ключ
  - ID Tournament – Внешний ключ
  - ID Season – Внешний ключ
  - ID Home Team – Внешний ключ
  - ID Away Team – Внешний ключ

Countries

	id	name	link	flaq
1	1	Afghanistan	/en/country/AFG/Afghanistan-Football	AFG
2	2	Albania	/en/country/ALB/Albania-Football	ALB
3	3	Algeria	/en/country/ALG/Algeria-Football	ALG
4	4	American Samoa	/en/country/ASA/American-Samoa-Football	ASA
5	5	Andorra	/en/country/AND/Andorra-Football	AND
6	6	Angola	/en/country/ANG/Angola-Football	ANG
7	7	Anguilla	/en/country/AIA/Anguilla-Football	AIA
8	8	Antigua and Barbuda	/en/country/ATG/Antigua-and-Barbuda-Football	ATG
9	9	Argentina	/en/country/ARG/Argentina-Football	ARG
10	10	Armenia	/en/country/ARM/Armenia-Football	ARM
11	11	Aruba	/en/country/ARU/Aruba-Football	ARU
12	12	Australia	/en/country/AUS/Australia-Football	AUS
13	13	Austria	/en/country/AUT/Austria-Football	AUT
14	14	Azerbaijan	/en/country/AZE/Azerbaijan-Football	AZE
15	15	Bahamas	/en/country/BAH/Bahamas-Football	BAH
16	16	Bahrain	/en/country/BHR/Bahrain-Football	BHR
17	17	Bangladesh	/en/country/BAN/Bangladesh-Football	BAN
18	18	Barbados	/en/country/BRB/Barbados-Football	BRB
19	19	Belarus	/en/country/BLR/Belarus-Football	BLR
20	20	Belgium	/en/country/BEL/Belgium-Football	BEL
21	21	Belize	/en/country/BLZ/Belize-Football	BLZ
22	22	Benin	/en/country/BEN/Benin-Football	BEN
23	23	Bermuda	/en/country/BER/Bermuda-Football	BER
24	24	Bhutan	/en/country/BHU/Bhutan-Football	BHU
25	25	Bolivia	/en/country/BOL/Bolivia-Football	BOL
26	26	Bonaire	/en/country/BOE/Bonaire-Football	BOE
27	27	Bosnia and Herzegovina	/en/country/BIH/Bosnia-and-Herzegovina-Football	BIH
28	28	Botswana	/en/country/BOT/Botswana-Football	BOT

Matches

	id	id tourna	id season	time	date	referee	venue	link	id home	home tea	id away	t	away	tear
1	1	1	1	59	19:00	2021-07-16	Nicolás Lamolina	Estadio 15 de Abril	/en/matches/7d47cd4/CA-Union-Boca-Juniors-July-16-2021-Primera-Division	48	1	33	1	
2	2	1	1	59	21:15	2021-07-16	Jorge Baliño	Estadio Eva Peron de Junín	/en/matches/64d43c21/Sarmiento-Estudiantes-July-16-2021-Primera-Division	45	0	57	3	
3	3	1	1	59	13:30	2021-07-17	Silvio Trucco	Estadio José María Minella	/en/matches/162c2257/Aldosivi-Patronato-July-17-2021-Primera-Division	31	0	40	2	
4	4	1	1	59	15:45	2021-07-17	Pablo Echavarría	Estadio Ciudad de Lanús	/en/matches/1d76193f/Lanus-Tucuman-July-17-2021-Primera-Division	38	4	55	2	
5	5	1	1	59	15:45	2021-07-17	Hernán Mastrángelo	Estadio Marcelo Alberto Bielsa	/en/matches/5e5afba3/Newells-OB-Talleres-July-17-2021-Primera-Division	39	3	46	2	
6	6	1	1	59	18:00	2021-07-17	Fernando Espinoza	Estadio Juan Carmelo Zerillo	/en/matches/34e6b943/Gimnasia-ELP-Platense-July-17-2021-Primera-Division	56	2	41	2	
7	7	1	1	59	20:15	2021-07-17	Germán Delfino	Estadio José Amalfitani	/en/matches/26b94d03/Veles-Sarsf-Racing-Club-July-17-2021-Primera-Division	49	0	62	0	
8	8	1	1	59	13:30	2021-07-18	Ariel Penel	Estadio Tomás Adolfo Ducó	/en/matches/115548d/CA-Huracan-Defensa-y-Just-July-18-2021-Primera-Division	36	2	60	1	
9	9	1	1	59	15:45	2021-07-18	Leandro Rey Hilfer	Estadio Julio Humberto Grondona	/en/matches/2218cbea/Arsenal-San-Lorenzo-July-18-2021-Primera-Division	29	1	44	1	
10	10	1	1	59	18:00	2021-07-18	Dario Herrera	Estadio Monumental Antonio Vespucio Libe...	/en/matches/723011d3/River-Plate-Colon-July-18-2021-Primera-Division	42	1	35	2	
11	11	1	1	59	20:15	2021-07-18	Andrés Merlos	Estadio Libertadores de América	/en/matches/e6eb0d7c/Independiente-Argentinos-Jun-July-18-2021-Primera-Division	37	0	28	0	
12	12	1	1	59	18:00	2021-07-19	Fernando Echenique	Estadio Monumental Antonio Vespucio Libe...	/en/matches/10e808b/CC-Cordoba-Banfield-July-19-2021-Primera-Division	34	1	32	1	
13	13	1	1	59	20:15	2021-07-19	Yael Falcón	Estadio Feliciano Gambarte	/en/matches/ab4d0831/Godoy-Cruz-Rosario-Cent-July-19-2021-Primera-Division	50	2	43	1	
14	14	1	1	59	19:00	2021-07-23	Diego Abal	Estadio Monumental Presidente José Fier...	/en/matches/7e25b287/Tucuman-CA-Huracan-July-23-2021-Primera-Division	55	1	36	0	
15	15	1	1	59	21:15	2021-07-23	Nazareno Arasa	Estadio Ciudad de Vicente López	/en/matches/b0d8c06f/Platense-Aldosivi-July-23-2021-Primera-Division	41	0	31	1	
16	16	1	1	59	13:30	2021-07-24	Fernando Echenique	Estadio Brigadier General Estanislao Lóp...	/en/matches/fa24fb8c/Colon-Lanus-July-24-2021-Primera-Division	35	1	38	4	
17	17	1	1	59	15:45	2021-07-24	Fernando Espinoza	Estadio Pedro Bidegain	/en/matches/a63a0190/San-Lorenzo-CC-Cordoba-July-24-2021-Primera-Division	44	1	34	0	
18	18	1	1	59	18:00	2021-07-24	Leandro Rey Hilfer	Estadio Presidente Juan Domingo Perón	/en/matches/c67d3e54/Racing-Club-Gimnasia-ELP-July-24-2021-Primera-Division	62	0	56	0	
19	19	1	1	59	20:15	2021-07-24	Pablo Echavarría	Estadio Florencio Solá	/en/matches/8ee870c0/Banfield-Boca-Juniors-July-24-2021-Primera-Division	32	0	33	0	
20	20	1	1	59	13:30	2021-07-25	Andrés Merlos	Estadio Presbítero Bartolomé Grella	/en/matches/c33cfdd/Patronato-Sarmiento-July-25-2021-Primera-Division	40	2	45	0	
21	21	1	1	59	13:30	2021-07-25	Silvio Trucco	Estadio Norberto Tito Tomaghello	/en/matches/d2dc0b7b/Defensa-y-Just-Godoy-Cruz-July-25-2021-Primera-Division	60	1	50	2	
22	22	1	1	59	15:45	2021-07-25	Fernando Rapallini	Estadio Dr. Lisandro de la Torre	/en/matches/158a3da2/Rosario-Cent-Veles-Sarsf-July-25-2021-Primera-Division	43	1	49	0	
23	23	1	1	59	18:00	2021-07-25	Hernán Mastrángelo	Estadio Monumental Antonio Vespucio Libe...	/en/matches/957ba8ae/River-Plate-CA-Union-July-25-2021-Primera-Division	42	4	48	0	
24	24	1	1	59	20:15	2021-07-25	Pablo Dóvalo	Estadio Jorge Luis Hirschi	/en/matches/1f1f8bb5/Estudiantes-Independiente-July-25-2021-Primera-Division	57	0	37	1	
25	25	1	1	59	18:00	2021-07-26	Ariel Penel	Estadio Francisco Cabases	/en/matches/4f006e29/Talleres-Arsenal-July-26-2021-Primera-Division	46	2	29	0	
26	26	1	1	59	20:15	2021-07-26	Jorge Baliño	Estadio Diego Armando Maradona	/en/matches/aeef8c6f/Argentinos-Jun-Newells-OB-July-26-2021-Primera-Division	28	1	39	0	
27	27	1	1	59	16:30	2021-07-27	Hernán Mastrángelo	Estadio Tomás Adolfo Ducó	/en/matches/c369e1b6/CA-Huracan-Colon-July-27-2021-Primera-Division	36	1	35	1	

Players

	id	id	country	full name	link	id	team
1	1		1	Abdullah Abdalli	/en/players/1639ab24/Abdullah-Abdalli		None
2	2		1	Masood Abdulsaeed	/en/players/e14d989a/Masood-Abdulsaeed		None
3	3		1	Mohammad Afshar	/en/players/2856ae3e/Mohammad-Afshar		None
4	4		1	Mustafa Afshar	/en/players/64372bee/Mustafa-Afshar		None
5	5		1	Bashir Ahmad Saadat	/en/players/efc4d9d0/Bashir-Ahmad-Saadat		None
6	6		1	Wahid Ahmad	/en/players/16068503/Wahid-Ahmad		None
7	7		1	Amir Ahmadi	/en/players/72a153a0/Amir-Ahmadi		2357
8	8		1	Belal Ahmadi	/en/players/5c6ff9fa/Belal-Ahmadi		2502
9	9		1	Qesmat Ahmadi	/en/players/c8fa443e/Qesmat-Ahmadi		None
10	10		1	Sandjar Ahmadi	/en/players/6fc4b0d5/Sandjar-Ahmadi		None
11	11		1	Baktash Akbari	/en/players/3c74b878/Baktash-Akbari		None
12	12		1	Amir Ali Ahmadi	/en/players/149ed0b4/Amir-Ali-Ahmadi		2479
13	13		1	Morteza Alibeik	/en/players/3a5583d4/Morteza-Alibeik		None
14	14		1	Abassin Alikhil	/en/players/fb3920b4/Abassin-Alikhil		None
15	15		1	Hussain Alizada	/en/players/6c2728c7/Hussain-Alizada		None
16	16		1	Meraj Allahdad	/en/players/68a266fa/Meraj-Allahdad		None
17	17		1	Khaibar Amani	/en/players/8d1c384a/Khaibar-Amani		None
18	18		1	Mujtaba Ameen	/en/players/23b47aeb/Mujtaba-Ameen		None
19	19		1	Hassan Amin	/en/players/f96f901a/Hassan-Amin		None
20	20		1	Haroon Amiri	/en/players/83a5b1cd/Haroon-Amiri		None
21	21		1	Norlla Amiri	/en/players/ef0c7536/Norlla-Amiri		None
22	22		1	Shamsuddin Amiri	/en/players/28032597/Shamsuddin-Amiri		None
23	23		1	Zubayr Amiri	/en/players/85f23a41/Zubayr-Amiri		None
24	24		1	Mohammad Anwar Akbari	/en/players/2bb0b77a/Mohammad-Anwar-Akbari		None
25	25		1	Amiruddin Anwar	/en/players/e356ac6a/Amiruddin-Anwar		None
26	26		1	Balal Arezou	/en/players/a4d17cf9/Balal-Arezou		None
27	27		1	Hailal Arghandiwal	/en/players/099938f8/Hailal-Arghandiwal		2496

Seasons

	id	name
1	1	1988-1989
2	2	1989-1990
3	3	1990-1991
4	4	1991-1992
5	5	1992-1993
6	6	1993-1994
7	7	1994-1995
8	8	1995-1996
9	9	1996
10	10	1996-1997
11	11	1997
12	12	1997-1998
13	13	1998
14	14	1998-1999
15	15	1999
16	16	1999-2000
17	17	2000
18	18	2000-2001
19	19	2001
20	20	2001-2002
21	21	2002
22	22	2002-2003
23	23	2003
24	24	2003-2004
25	25	2004
26	26	2004-2005

## Teams

	id	id country	name	gender	link
1	1	2	Besa Kavajë	M	/en/squads/2fdee617/history/Besa-Kavaje-Stats-and-History
2	2	2	FK Kukësi	M	/en/squads/f1e85b1e/history/FK-Kukesi-Stats-and-History
3	3	2	FK Partizani Tirana	M	/en/squads/3ba2fddf/history/FK-Partizani-Tirana-Stats-and-History
4	4	2	FK Tomori Berat	M	/en/squads/fc4db0b4/history/FK-Tomori-Berat-Stats-and-History
5	5	2	Flamurtari Vlorë	M	/en/squads/3d81ccdb/history/Flamurtari-Vlore-Stats-and-History
6	6	2	KF Bylis Ballsh	M	/en/squads/bc8abb97/history/Bylis-Stats-and-History
7	7	2	KF Elbasani	M	/en/squads/ddab4421/history/KF-Elbasani-Stats-and-History
8	8	2	KF Feronikeli	M	/en/squads/abffa138/history/KF-Feronikeli-Stats-and-History
9	9	2	KF Laçi	M	/en/squads/7a40cd8b/history/KF-Laci-Stats-and-History
10	10	2	KF Skënderbeu Korçë	M	/en/squads/df526548/history/KF-Skenderbeu-Korce-Stats-and-History
11	11	2	KF Teuta Durrës	M	/en/squads/2b924bc5/history/KF-Teuta-Durres-Stats-and-History
12	12	2	KF Tirana	M	/en/squads/83310fa5/history/KF-Tirana-Stats-and-History
13	13	2	KF Vllaznia Shkodër	F	/en/squads/d8deaf72/history/Vllaznia-Shkoder-Stats-and-History
14	14	2	KF Vllaznia Shkodër	M	/en/squads/e3a68c8b/history/KF-Vllaznia-Shkoder-Stats-and-History
15	15	2	KS Dinamo Tirana	M	/en/squads/d1c1d627/history/KS-Dinamo-Tirana-Stats-and-History
16	16	2	Luftëtari Gjirokastrë	M	/en/squads/0e3f0159/history/Luftetari-Gjirokaster-Stats-and-History
17	17	5	CE Principat	M	/en/squads/38120ffa/history/CE-Principat-Stats-and-History
18	18	5	Constel·lació Esportiva	M	/en/squads/4c7d11b8/history/Constellacio-Esportiva-Stats-and-History
19	19	5	FC Encamp	M	/en/squads/70ee5e92/history/FC-Encamp-Stats-and-History
20	20	5	FC Lusitanos	M	/en/squads/857b60c3/history/FC-Lusitanos-Stats-and-History
21	21	5	FC Rànger s	M	/en/squads/f654070c/history/FC-Rangers-Stats-and-History
22	22	5	FC Santa Coloma	M	/en/squads/9549dc95/history/FC-Santa-Coloma-Stats-and-History
23	23	5	Inter Club d Escaldes	M	/en/squads/fb45dbb9/history/Inter-dEscaldes-Stats-and-History
24	24	5	UE Engordany	M	/en/squads/b784c866/history/UE-Engordany-Stats-and-History
25	25	5	UE Sant Julià	M	/en/squads/78816dd0/history/UE-Sant-Julia-Stats-and-History
26	26	5	UE Santa Coloma	M	/en/squads/84a33cca/history/UE-Santa-Coloma-Stats-and-History
27	27	8	Antigua Barracuda FC	M	/en/squads/19d27917/history/Antigua-Barracuda-Stats-and-History
28	28	0	AA Argentinos Juniors	M	/en/squads/d01a652b/history/Argentinos-Juniors-Stats-and-History

## Tournaments

	id tournament	id season	id country	name	link	id champ	id top pla
1	1	59	9	Argentine Primera División (M)	/en/comps/21/Primera-Division-Stats	42	1947
2	1	56	9	Argentine Primera División (M)	/en/comps/21/3211/2019-2020-Superliga-Argentina-Stats	33	33375
3	1	54	9	Argentine Primera División (M)	/en/comps/21/2436/2018-2019-Superliga-Argentina-Stats	62	4404
4	1	52	9	Argentine Primera División (M)	/en/comps/21/1659/2017-2018-Superliga-Argentina-Stats	33	175936
5	1	50	9	Argentine Primera División (M)	/en/comps/21/1554/2016-2017-Primera-Division-Stats	33	2302
6	1	49	9	Argentine Primera División (M)	/en/comps/21/1494/2016-Primera-Division-Stats	38	5913
7	1	47	9	Argentine Primera División (M)	/en/comps/21/789/2015-Primera-Division-Stats	33	5812
8	1	45	9	Argentine Primera División (M)	/en/comps/21/718/2014-Primera-Division-Stats	62	5778
9	2	60	12	A-League (M)	/en/comps/65/A-League-Men-Stats	None	7654
10	2	58	12	A-League (M)	/en/comps/65/10764/2020-2021-A-League-Stats	88	7654
11	2	56	12	A-League (M)	/en/comps/65/3212/2019-2020-A-League-Stats	98	7654
12	2	54	12	A-League (M)	/en/comps/65/2381/2018-2019-A-League-Stats	98	56805
13	2	52	12	A-League (M)	/en/comps/65/1617/2017-2018-A-League-Stats	90	17145
14	2	50	12	A-League (M)	/en/comps/65/1512/2016-2017-A-League-Stats	98	7654
15	2	48	12	A-League (M)	/en/comps/65/1453/2015-2016-A-League-Stats	80	7344
16	2	46	12	A-League (M)	/en/comps/65/719/2014-2015-A-League-Stats	90	8843
17	2	44	12	A-League (M)	/en/comps/65/655/2013-2014-A-League-Stats	83	8102
18	2	42	12	A-League (M)	/en/comps/65/588/2012-2013-A-League-Stats	85	7698
19	2	40	12	A-League (M)	/en/comps/65/520/2011-2012-A-League-Stats	83	108499
20	2	38	12	A-League (M)	/en/comps/65/453/2010-2011-A-League-Stats	83	91982
21	2	36	12	A-League (M)	/en/comps/65/385/2009-2010-A-League-Stats	98	121174
22	2	34	12	A-League (M)	/en/comps/65/327/2008-2009-A-League-Stats	90	121174
23	2	32	12	A-League (M)	/en/comps/65/271/2007-2008-A-League-Stats	93	7419
24	2	30	12	A-League (M)	/en/comps/65/220/2006-2007-A-League-Stats	90	6977
25	2	28	12	A-League (M)	/en/comps/65/175/2005-2006-A-League-Stats	98	7268
26	3	60	12	A-League Women (F)	/en/comps/196/A-League-Women-Stats	91	55651



### 3. Проработка визуального интерфейса.

#### Главный экран

CountriesTeamsPlayersSeasonsTournamentsMatches

ID	Name	Link	Flag
1	Russia	/en/country/RUS/Russian-Football	RUS
1	Russia	/en/country/RUS/Russian-Football	RUS
1	Russia	/en/country/RUS/Russian-Football	RUS
1	Russia	/en/country/RUS/Russian-Football	RUS
1	Russia	/en/country/RUS/Russian-Football	RUS
1	Russia	/en/country/RUS/Russian-Football	RUS
1	Russia	/en/country/RUS/Russian-Football	RUS
1	Russia	/en/country/RUS/Russian-Football	RUS
1	Russia	/en/country/RUS/Russian-Football	RUS
1	Russia	/en/country/RUS/Russian-Football	RUS
1	Russia	/en/country/RUS/Russian-Football	RUS
1	Russia	/en/country/RUS/Russian-Football	RUS
1	Russia	/en/country/RUS/Russian-Football	RUS
1	Russia	/en/country/RUS/Russian-Football	RUS
1	Russia	/en/country/RUS/Russian-Football	RUS
1	Russia	/en/country/RUS/Russian-Football	RUS

Open Manager

#### Менеджер запросов

ComboBox

ComboBox

ComboBox

ComboBox

ComboBox

ComboBox

Name

Accept

Cancel

## 4. Диаграмма классов

