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Foot-Race Management Database
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Document Conventions:

- Race is a shortened reference to an individual foot-race.
- RMD is a race management database: A database solution engineered to memorialize many races and relationships between races, racers, officials, venues, clubs, registrations, and prizes awarded.
- A club is a (footrace organization) which organizes and conducts foot-races at locations it deems suitable for such races. If a race is repeated, it will have the same location.

This document describes the functional and logical requirements for the design and construction of an RMD.

A particular race is arranged and organized by one club, but anyone (other than the race official for that particular race) who properly registers and pays the appropriate entry fee may participate as a runner in the race.

The conduct of an individual race will work as follows:

1. A venue, date, time, distance, entry fee, and race name will be selected for the race.
2. An official will be selected for the race who is not a member of the organizing club
3. Runners will register and pay the entry fee minus any discounts they are eligible for. (Payment may be delayed until race day, but must be surrendered prior to participation in the race).
4. Runners will be assigned unique participant numbers which will be physically issued to the runner on large wearable and weatherproof paper on race day. Runners will affix the numbers to their shirts for the duration of the race.
5. At the appointed time, the race will be started by sounding of a horn. The start time will be recorded simultaneously with the sounding of the start horn.

6. As racers cross the finish line, the order in which they finish will be recorded by removing the racer's large wearable paper number and spiking the number on a vertical spindle.
7. As racers cross the finish line, a finish time will be recorded without concern for matching individual racers to the time.
8. After the last finisher has crossed the line, the stack of finish times will be matched to the stack of racer numbers in a Last-In-First-Out manner. In this way, individual racer race times can be determined and recorded.
9. An overall winner (best, shortest race time) will be determined.
10. Winners by category may also be determined
11. Best average time by a club will be determined.
12. Best time by a club will be determined.

Each race

- is organized by a club, and each club has members who can be runners.
- Is officiated by one qualified individual who is not part of any clubs, and who cannot otherwise participate in the race.
- Is conducted at a particular address, on a particular date, at a particular planned time.
- Has a distance
- May have many club member participants from different clubs as runners in the race.
- May have non-club-member participants.
- Has one and only one overall winner.
- May have winners by sex, age, team, etc…
- Has a particular fee for entry into each race
- Requires that the entry fee MUST be paid before an entrant may be issued a number or have race-time calculated.
- Has an actual (exact) start time which is set when the starting horn is sounded.

Each club

- Has an address
- Is composed of members
- May organize races
- Has a unique name

Each racer

- Has a name
- Has an address
- May have a phone
- Has a sex
- May or may not be Disabled
- Has a birthdate
- May or may not be a member of a club
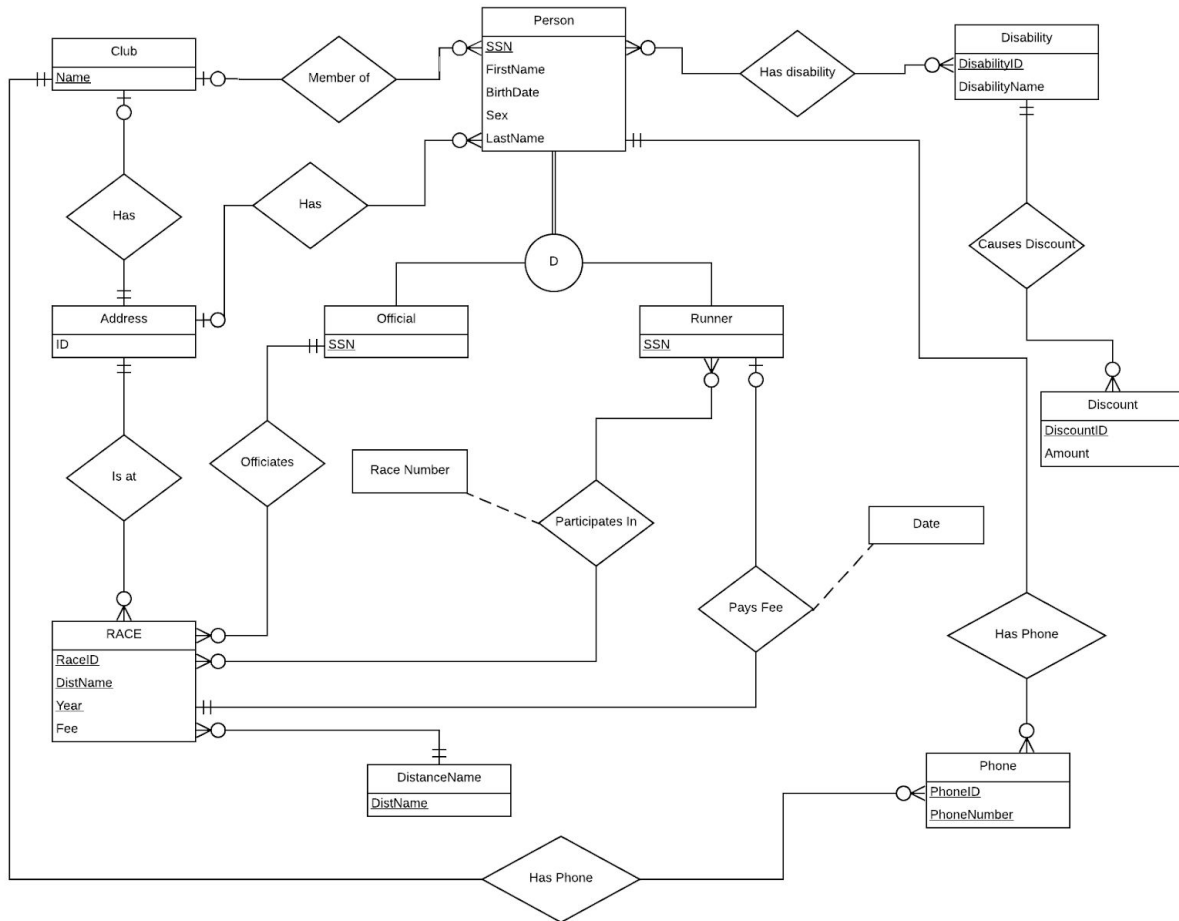- Can participate in only one race at a time

Each official

- May or may not be a member of a club.
- Can officiate only one race at a time
- Cannot officiate a race sponsored by any club of which the official is a member.
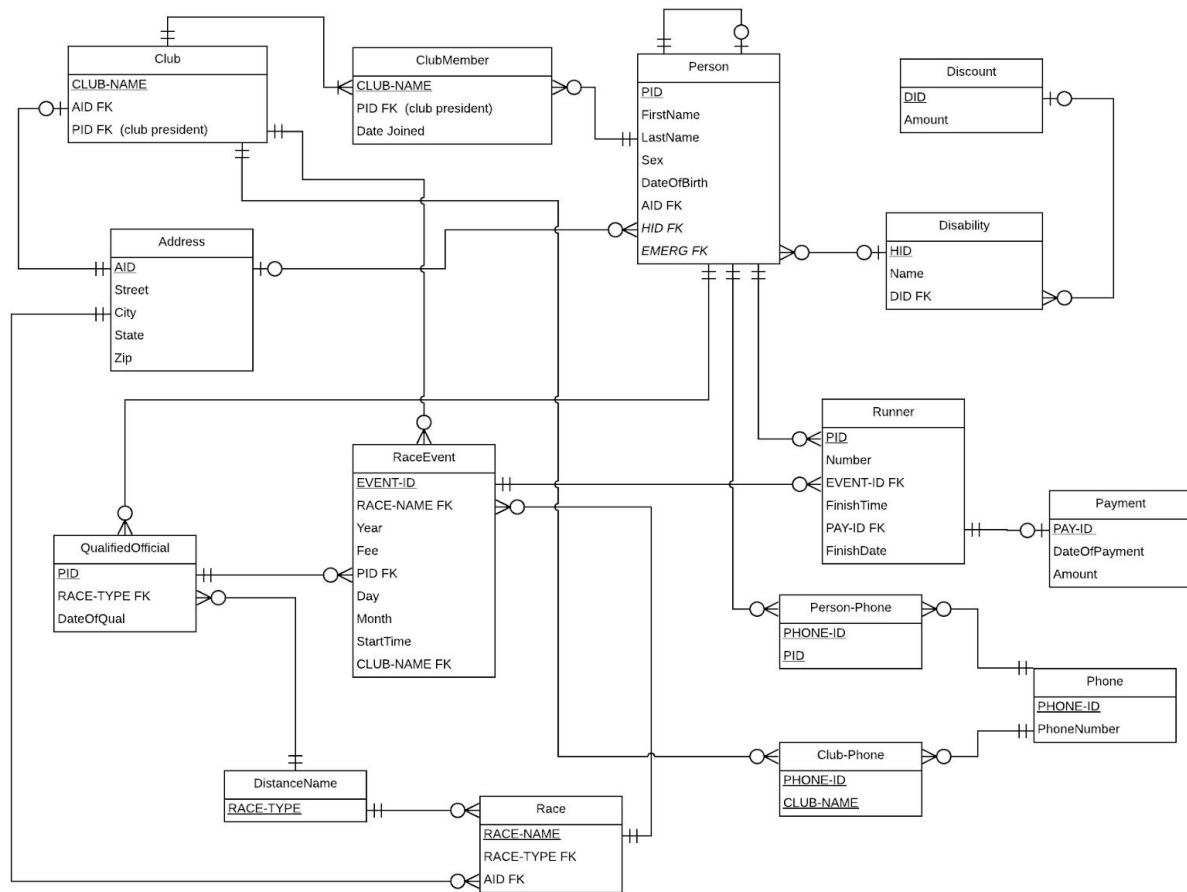
A Location

- Must have an address.

1.   A club can have **zero or many** Persons, but a Person belongs to **zero or one** clubs.

2.   A club has **one and only one** address, and an address can be for **zero or one** club

3.   An address can be the location of **zero or many** races, but a race can have **one and only one** address

4.   An address may be for **zero or many** People, and a Person, who is not required to give their address may have **Zero or one** address.

5.   A person may have **one or zero** Emergency Contact, but a particular Person's emergency contact is **one and only one** other Person.

6.   A Person may have **zero or one** disability, but a disability may belong to **zero or many** persons.

7.   A disability may qualify for **zero or one** discount, and a discount may apply to **zero or many** disabilities.

8.   A Person may be a runner in **zero or many** races, but a runner is always **one and only one** person.

9.   A runner makes **zero or one** payment, and a payment applies to **one and only one** runner.

10.   A Race_Event may have **zero or many** runners, and a runner may participate in **one and only one** Race_Event.

11.   A Race_Event may be officiated by **one and only one** Official, but a particular official may serve **zero or many** Race_Events.

12.   A Race_Event has **one and only one** Race*(Name & Location)*, but a Race could be instantiated in **zero or many** Race_Events.

13.   A Race*(Name and Location)* can have **one and only one** DistanceName but a DistanceName could apply to **zero or many** Race(Name and Locations)

14.   A DIstanceName can apply to **zero or one** certifications, and a certification applies to **one and only one** DistanceName.

15.   A Qualification may belong to **one and only on**e Person, but a Person may have **zero or many** Qualifications.

[Link to LucidChart Documant](#)

[Link to LuicidChart document](#)

Person

PID	FirstName	LastName	Sex	DOB	AID	HID
1	Tyler	Fuller	Male	10/01/1998	1	1
2	Braydon	Krause	Male	05/21/1996	2	NULL
3	Delilah	Berger	Female	07/19/2000	3	2
4	Armani	Norton	Female	10/05/1994	4	NULL
5	Joey	Lynn	Male	01/18/1999	5	NULL
6	Zackary	Spears	Male	03/08/1988	13	NULL
7	Izabella	Jensen	Female	06/14/1981	14	NULL

Runner

PID	EVENT-ID	Number	FinishDate	24hrFinishTime	PAY-ID
1	1	1157	05/24/17	1342	1
2	3	7473	02/29/16	1455	2
3	2	0489	01/01/2018	1432	3
4	5	2634	07/12/2018	1350	4
5	4	NULL	NULL	NULL	NULL

DistanceName

RACE-TYPE
3K
5K
10K
Half Marathon
Marathon
50 Miler
100 Miler

RaceEvent

EVENT-ID	OID	RACE-NAME	CLUB-NAME	Month	Day	Year	24hrStartTime	Fee
1	6	Happy 5K	New York Sprinters	05	24	2017	1302	$5.00
2	7	Cancer Half Marathon	Globetrotters	01	01	2018	0834	$15.00
3	7	Sad Marathon	Globetrotters	02	29	2016	0823	$25.00
4	6	Sunny 10K	New York Sprinters	06	18	2019	0916	$10.00
5	6	Color Run 5K	We Got Flip-Flops	07	12	2018	1210	$5.00

Address

AID	Street	City	State	Zip
1	98 New St.	Malvern	PA	19355
2	58 Princess Dr.	Appleton	WI	54911
3	900 NE. Clark Court	Austin	MN	55912
4	856 Princeton Ave.	Hillsboro	OR	97124
5	9793 N. Hanover Rd.	Bronx	NY	10465
6	55 Monroe Circle	Collierville	TN	38017
7	7324 Vine Court	La Vergne	TN	37086
8	916 Edgemont St.	Jamaica Plain	MA	02130
9	478 Iroquois Dr.	Saint Johns	FL	32259
10	797 Heritage St.	Ozone Park	NY	10005
11	946 Henry Smith Rd	Mc Lean	VA	22101
12	219 Prospect Street	Woodstock	GA	30188
13	46 West Helen Lane	Clermont	FL	34711
14	9189 Sutor Ave.	Hopewell	VA	23860

Phone

PHONE-ID	Number
1	202-555-0149
2	202-555-0123
3	202-555-0145
4	202-555-0132
5	202-555-0142
6	202-555-0125
7	202-555-0132
8	919-798-9252
9	578-236-3818
10	275-398-3269

ClubPhone

CLUB-NAME	PHONE-ID
New York Sprinters	8
Globetrotters	9
We Got Flip-Flops	10

Qualification

OID	QualDate	RACE-TYPE
6	05/01/2015	3K
6	05/02/2015	5K
6	05/03/2015	10K
7	05/01/2014	Half Marathon
7	05/02/2014	Marathon
7	05/03/2014	50 Miler
7	05/04/2014	100 Miler

PersonPhone

PID	PHONE-ID
1	1
2	2
3	3
4	4
5	5
6	6
7	6

Memebership

PID	CLUB-NAME	JoinDate
1	Globetrotters	05/07/2015
2	We Got Flip-Flops	02/20/2018
3	We Got Flip-Flops	07/09/2017
6	Globetrotters	05/01/2014
7	New York Sprinters	08/12/2015
5	New York Sprinters	09/24/2014

Club

CLUB-NAME	AID
New York Sprinters	10
Globetrotters	11
We Got Flip-Flops	12

Disability

HID	Name	DID
1	WheelChair	3
2	Blind	4
3	1 Prosthetic Leg	2
4	2 Prosthetic Legs	3
5	Other	1

Discount

DID	Amount
1	10%
2	25%
3	50%
4	100%

Race

RACE-NAME	RACE-TYPE	AID
Happy 5K	5K	6
Cancer Half Marathon	Half Marathon	7
Sad Marathon	Marathon	8
Sunny 10K	10K	9
Color Run 5K	5K	7

Payment

PAY-ID	DatePaid	AmountPaid
1	05/23/2017	$4.50
2	02/28/2016	$25.00
3	12/31/2018	$11.25
4	07/11/2018	$5.00

Person(PID, FirstName, LastName, Sex, DOB, AID, HID, EMERG)
AID Foreign key References AID in Address table,
HID Foreign Key references HID in Disability table,
EMERG Foreign key references PID in Person table (Self Join).

Runner(PID, EVENT-ID, FinishDate, FinishTime, Number, PAY-ID)
PID Foreign key References PID in Person,
EVENT-ID Foreign Key references EVENT-ID in RaceEvent table,
PAY-ID Foreign Key references PAY-ID in Payment table.

DistanceName(RACE-TYPE)

RaceEvent(EVENT-ID, OID, RACE-NAME, CLUB-NAME, Month, Day, Year, 24HourStartTime, Fee)
RACE-NAME Foreign Key references RACE-NAME in RACE table,
OID Foreign Key references OID in QualifiedOfficial table.

Address (AID, STREET, CITY, STATE, ZIP)

Phone (PHONE-ID, Number)

ClubPhone (CLUB-NAME, PHONE-ID)
PHONE-ID Foreign Key references PHONE-ID in Phone table,
CLUB-NAME Foreign Key references CLUB-NAME in Club table.

PersonPhone (PID, PHONE-ID)
PHONE-ID Foreign Key references PHONE-ID in Phone table,
PID Foreign Key references PID in Person table.

QualifiedOfficial (OID, QualDate, RACE-TYPE)
RACE-TYPE Foreign Key references RACE-TYPE in DistanceName table.

Disability(HID, NAME, DID)
DID Foreign key References DID in Discount

Discount(DID, AMOUNT)

Payment(PAY-ID, DatePaid, AmountPaid)

Race(<u>RACE-NAME</u>, <u>RACE-TYPE</u>, AID)

Race-Type Foreign Key references Race-Type in DistanceName,

AID Foreign Key references AID in Address.

Club(<u>CLUB-NAME</u>, AID)

AID Foreign Key references AID in Address,

Membership(<u>CLUB-NAME</u>, <u>PID</u>, DATE-JOINED)

CLUB-NAME Foreign Key references CLUB-NAME in Club table,

PID Foreign Key references PID in Person table.

PID → FirstName, LastName, Sex, DOB, EMERG

PID EVENT-ID → FinishDate, FinishTime, Number, PAY-ID

EVENT-ID → OID, RACE-NAME, CLUB-NAME, Month, Day, Year, 24hrStart-Time, Fee

PHONE-ID → Number

CLUB-NAME → PHONE-ID

PID → PHONE-ID

OID → Qual-Date, RACE-TYPE

HID → Name, DID

DID → Amount

PAY-ID → DatePaid, AmountPaid

RACE-NAME → RACE-TYPE, AID

CLUB-NAME → AID

CLUB-NAME PID → DateJoined

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