Project Narrative

The Lake Ouachita Vista Trail Endurance Race (LOVIT) is a new ultra-running trail race in Arkansas. The race has been held consecutively for the last three years (2015 to 2017) and is currently awaiting it’s fourth annual race this February. The LOVIT is a 100-mile trail run that is open to both men and women of all ages from all over the country. While the race committee does a good job of recording each year’s data results on the race website, I believe that a database would help the committee record and use the data in meaningful ways that could help grow the race and organization.

Data Questions

I would like to build a database of the runners and results of this race using the data from the last three completed race years. I believe doing so will help the race directors find a target audience of runner’s which would then help grow the race into a larger, more profitable venture. With the given data I will attempt to understand:

* What is the average age of competing runners?
* Who are the fastest runners/what is the race record in terms of finish time?
* Does a gender gap exist between runners?
* What is the percentage of runners traveling from states other than Arkansas, and should the committee advertise in those other states?

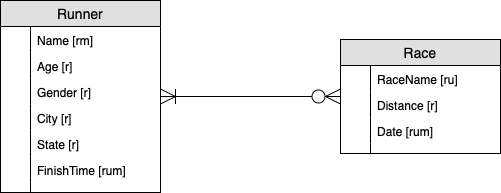
Data/Race Parameters

In order to build the database, a few points must first be made. Runners’ are listed in the results section with their first and last name, city, state, age, gender, and time of completion.

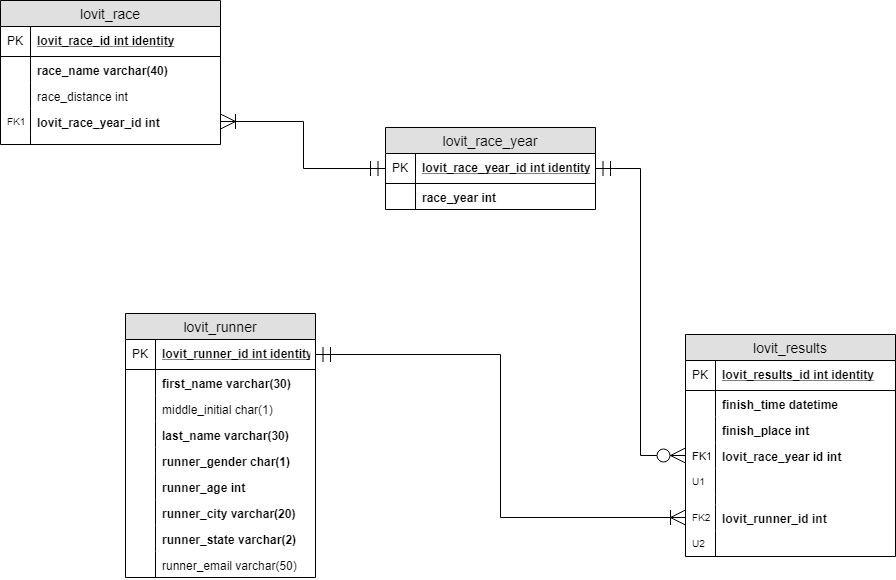
Runner’s may or may not compete in the race each consecutive year; however, the race must obviously have runners for there to be a competition. It is worth noting that not all competitors complete the race, which results in a 0 value for ‘finish time as well as ‘race place’. It should be noted that a single race generally takes longer than 24 hours to complete, which can lead to difficulty in datetime storage within SQL.

The race name and distance do not change in this database (LOVIT, 100 miles), but I have worked to position this database in a manner that would allow the committee to change either value and/or add another race to the database if they wish to do so.

**The Conceptual Model**

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Improved Logical Model



PART 2: Implementation

Insert statements can be seen below within this code. This code should copy/paste into SQL and run appropriately

SQL CODE

--Creating the Runner table

CREATE TABLE Lovit\_Runner (

--Columns for the Runner table

Lovit\_Runner\_ID int identity,

First\_name varchar(30) not null,

Middle\_Initial char(1),

Last\_name varchar(30) not null,

Runner\_gender char(1) not null,

Runner\_age int not null,

Runner\_city varchar(20) not null,

Runner\_state varchar(2) not null,

Runner\_email varchar(50),

--Constraints on the Runnertable

CONSTRAINT PK\_lovit\_runner PRIMARY KEY (Lovit\_runner\_id)

)

--End Creating Runner table

--Altering Runner table to allow for AGE null

ALTER TAble Lovit\_Runner

ALTER COLUMN Runner\_Age int NULL

--Creating the Race\_Year table

CREATE TABLE Lovit\_Race\_Year (

--Columns for the Race\_year table

Lovit\_Race\_Year\_ID int identity not null,

Race\_year int not null,

--Constraints on the Race\_year table

CONSTRAINT PK\_Lovit\_Race\_Year PRIMARY KEY (Lovit\_Race\_Year\_ID)

)

--End Creating Race\_Year table

--Creating the Race table

CREATE TABLE Lovit\_Race (

--Columns for the Race table

Lovit\_Race\_ID int identity not null,

Race\_Name varchar(40)not null,

Race\_Distance int,

Lovit\_Race\_YearID int not null

--Constraints on the Race table

CONSTRAINT PK\_Lovit\_Race PRIMARY KEY (Lovit\_Race\_ID),

CONSTRAINT FK1\_Lovit\_Race FOREIGN KEY (Lovit\_Race\_yearID) REFERENCES Lovit\_Race\_Year(Lovit\_Race\_year\_ID)

)

--End Creating the Race Table

--Creating the Results table

CREATE TABLE Lovit\_Results (

--Columns for the Results table

Lovit\_Results\_ID int identity not null,

Finish\_Time datetime,

Finish\_Place int,

Lovit\_Race\_Year\_ID int not null,

Lovit\_Runner\_ID int not null,

--Constraints on the Results table

CONSTRAINT PK\_Results PRIMARY KEY (Lovit\_Results\_ID),

CONSTRAINT FK1\_Results FOREIGN KEY (Lovit\_Race\_year\_ID) REFERENCES Lovit\_Race\_Year(Lovit\_Race\_year\_ID),

CONSTRAINT FK2\_Results FOREIGN KEY (Lovit\_Runner\_ID) REFERENCES Lovit\_Runner(Lovit\_Runner\_ID)

)

--End Creating the Results Table

--Function for proper Finish\_Time data storage

/\*

Converts a time presented as 'hh:mm:ss' to a datetime for storage

\*/

GO

CREATE OR Alter FUNCTION dbo.GetDateFromTime(@input\_time varchar(20))

RETURNS datetime as

BEGIN

DECLARE @return\_value datetime

DECLARE @start int, @end int

declare @values TABLE(splitdata decimal(18,4))

SELECT @start = 1, @end = CHARINDEX(':', @input\_time)

WHILE @start < LEN(@input\_time) + 1 BEGIN

IF @end = 0

SET @end = LEN(@input\_time) + 1

INSERT INTO @values(splitdata)

VALUES(convert(decimal(18,4), SUBSTRING(@input\_time, @start, @end - @start)))

SET @start = @end + 1

SET @end = CHARINDEX(':', @input\_time, @start)

END

DECLARE date\_parts CURSOR LOCAL FOR SELECT \* FROM @values

DECLARE @curr\_date\_part decimal(18,4)

set @return\_value = 0.0

OPEN date\_parts

FETCH NEXT FROM date\_parts into @curr\_date\_part

-- Hours

set @return\_value = dateadd(hh, convert(int, @curr\_date\_part), @return\_value)

FETCH NEXT FROM date\_parts into @curr\_date\_part

-- Minutes

set @return\_value = dateadd(n, convert(int, @curr\_date\_part), @return\_value)

FETCH NEXT FROM date\_parts into @curr\_date\_part

-- Seconds

set @return\_value = dateadd(s, convert(int, @curr\_date\_part), @return\_value)

return @return\_value

END

GO

CREATE OR ALTER FUNCTION dbo.GetTimeStringFromDate(@input\_date datetime)

RETURNS varchar(20) AS

BEGIN

DECLARE @return\_value varchar(20)

set @return\_value = convert(varchar(10), DATEDIFF(hh, 0.0, @input\_date)) + ':' + convert(varchar(10), DATEDIFF(n, 0.0, @input\_date) % 60) + ':' + CONVERT(varchar(10), DATEDIFF(s, 0.0, @input\_date) % 60)

RETURN @return\_value

END

GO

DECLARE @input\_time varchar(20)

SET @input\_time = '25:11:00'

DECLARE @sample\_date datetime

SELECT @sample\_date = dbo.GetDateFromTime(@input\_time)

DECLARE @back\_to\_time varchar(20)

SELECT @back\_to\_time = dbo.GetTimeStringFromDate(@sample\_date)

select

@input\_time

, @sample\_date

, @back\_to\_time

--End of Function Creation for proper Finish\_Time data storage

--Beginning of all Race Data input

--Adding data to the lovit\_race\_year table

INSERT INTO Lovit\_Race\_Year(race\_year)

Values

(2015),(2016),(2017)

SELECT \* FROM Lovit\_Race\_Year

--Adding data to the lovit\_race table

INSERT INTO Lovit\_Race(race\_name, Race\_Distance, Lovit\_Race\_YearID)

VALUES

('2015 Lake Ouachita Vista Trail Race', 100,1),

('2016 Lake Ouachita Vista Trail Race', 100,2),

('2017 Lake Ouachita Vista Trail Race', 100,3)

SELECT \* From Lovit\_Race

--Adding data to the Lovit\_Runner table from 2015 Race

INSERT INTO Lovit\_Runner(First\_name, Last\_Name, Runner\_gender, Runner\_city, Runner\_state)

VALUES

('Max', 'Frumes', 'M', 'Brooklyn', 'NY'),

('Justin', 'Walker', 'M', 'Tulsa', 'OK'),

('Paul', 'Schoenlaub', 'M', 'Saint Joesph', 'MO'),

('Noah', 'Churchill', 'M', 'Manila', 'AR'),

('Jason', 'Armitage', 'M', 'Hot Springs', 'AR'),

('Jeremy', 'Day', 'M', 'Magnolia', 'AR'),

('Elizabeth', 'Kimble', 'F', 'Ft.Smith', 'AR'),

('Randy', 'Windle', 'M', 'Hot Springs', 'AR'),

('Ian', 'Zurn', 'M', 'Crystal Lake', 'IL'),

('Rene', 'Villalobos', 'M', 'Fort Worth', 'TX'),

('Laura', 'Range', 'F', 'St.Louis', 'MO'),

('Jim', 'Sweatt', 'M', 'Little Rock', 'AR'),

('Tyler', 'Wilkerson', 'M', 'Russellville', 'AR')

--End of data to Lovit\_Runner table 2015 Race

--Adding data to the Lovit\_Runner table from 2016 Race

INSERT INTO Lovit\_Runner(First\_name, Last\_Name, Runner\_city, Runner\_state, Runner\_age, Runner\_gender)

VALUES

('Hunter', 'Dodds', 'Bilgola Plateau', 'AU', 38, 'M'),

('Dale', 'Humphrey', 'Ely', 'MN', 56, 'M'),

('Paul', 'Schoenlaub', 'St.Joseph', 'MO', 56, 'M'),

('Scott', 'Newcomer', 'York', 'PA', 45, 'M'),

('Tyler', 'Wilkerson', 'Russellville', 'AR', 27, 'M'),

('Jason', 'Willits', 'Bettendorf','IA', 32, 'M'),

('Susan', 'Donnelly', 'Oak Ridge', 'TN', 53, 'F'),

('Adam', 'Stoddard', 'Springfield', 'MO', 42, 'M'),

('Randy', 'Windle', 'Hot Springs', 'AR', 37, 'M'),

('Bill', 'James', 'Hot Springs', 'AR', 46, 'M'),

('Jason', 'Armitage', 'Hot Springs', 'AR', 43, 'M'),

('Gerardo', 'Ramirez', 'Fort Worth', 'TX', 43, 'M'),

('Kurt', 'Hauser', 'Hot Springs', 'AR', 51, 'M'),

('Paul', 'Turner', 'Conway', 'AR', 52, 'M'),

('Joshua', 'Sun', 'Davenport', 'IA', 30, 'M'),

('Brandon', 'Allen', 'Little Rock', 'AR', 33, 'M'),

('Rusty', 'Harvey', 'Gassville', 'AR', 30, 'M'),

('Aubrey', 'Callahan', 'Grand Prairie', 'TX', 33, 'F'),

('Tim', 'Boggs', 'Zanesville', 'OH', 54, 'M'),

('Ben', 'Mansur', 'Little Rock', 'AR', 44, 'M'),

('Shannon', 'McDowell', 'Paragould', 'AR', 39, 'F'),

('Rene', 'Villalobos', 'Fort Worth', 'TX', 57, 'F'),

('Ian', 'Zurn', 'Crystal Lake', 'IL', 34, 'M')

--End of data for Lovit\_Runner 2016 Race

--Adding data to the Lovit\_Runner table from 2017 Race

INSERT INTO Lovit\_Runner(First\_name, Last\_Name, Runner\_city, Runner\_state, Runner\_age, Runner\_gender)

VALUES

('Tyler', 'Wilkerson', 'Russellville', 'AR', 28, 'M'),

('Paul', 'Schoenlaub', 'St. Joseph', 'MO', 57, 'M'),

('David', 'Batchelder', 'Tulsa', 'OK', 24, 'M'),

('Bailee', 'Wilkerson', 'Russellville', 'AR', 26, 'F'),

('Gerardo', 'Ramirez', 'Fort Worth', 'TX', 44, 'M'),

('Randy', 'Windle', 'Hot Springs', 'AR', 38, 'M'),

('Kamm', 'Prongay', 'Portland', 'OR', 53, 'F'),

('Zac', 'Lundgren', 'Minneapolis', 'MN', 26, 'M'),

('Shalini', 'Kovach', 'Ballwin', 'MO', 41, 'F'),

('Aaron', 'Lebell', 'Jefferson', 'TX', 45, 'M'),

('Robert', 'Misener', 'Hot Springs', 'AR', 46, 'M'),

('Tabatha', 'Park', 'Royal', 'AR', 48,'F'),

('Jason', 'Armitage', 'Hot Springs', 'AR', 44, 'M'),

('Shannon', 'Hampton', 'Bentonville', 'AR', 44, 'M'),

('Terry', 'Jamieson', 'Ozark', 'MO', 53, 'M'),

('Jeremy', 'Brownfield', 'Ozark', 'MO', 36, 'M'),

('James', 'Fountain', 'Jessieville', 'AR', 43, 'M'),

('Darin', 'Anderson', 'Pearcy', 'AR', 45, 'M'),

('Kimmy', 'Riley', 'Mabelvale', 'AR', 55, 'F'),

('Nancy', 'Marks', 'Round Rock', 'TX', 56, 'F'),

('Aubrey', 'Callihan', 'Grand Prairie', 'TX', 34, 'M'),

('Jim', 'Sweatt', 'Little Rock', 'AR', 61, 'M'),

('Johnny', 'Eagles', 'Little Rock', 'AR', 65, 'M'),

('Jim', 'Hubbard', 'Ozark', 'MO', 50, 'M'),

('Rob', 'Henley', 'Fayetteville', 'AR', 34, 'M')

--End of Lovit\_Runner data for 2017 Race

SELECT \* FROM Lovit\_Runner

--Adding data (trial run) to the Lovit\_Results table 2015 Race

INSERT INTO Lovit\_Results(Lovit\_Runner\_ID,Finish\_Time, Finish\_Place,Lovit\_Race\_Year\_ID)

VALUES

(1, dbo.GetDateFromTime('23:19:42'), 1, 1)

SELECT \* FROM Lovit\_Results

--Adding more data to the Lovit\_Results table 2015 Race

INSERT INTO Lovit\_Results(Lovit\_Runner\_ID, Finish\_Time, Finish\_Place, Lovit\_Race\_Year\_ID)

VALUES

(2, dbo.GetDateFromTime('25:11:00'), 2, 1),

(3, dbo.GetDateFromTime('26:22:02'), 3, 1),

(4, dbo.GetDateFromTime('27:55:47'), 4, 1),

(5, dbo.GetDateFromTime('31:02:55'), 5, 1),

(6, dbo.GetDateFromTime('32:59:30'), 6, 1),

(7, dbo.GetDateFromTime('34:21:00'), 7, 1),

(8, null, null, 1),

(9, null, null, 1),

(10, null, null, 1),

(11, null, null, 1),

(12, null, null, 1),

(13, null, null, 1)

--End adding data to the Lovit\_Results 2015 Race

--Adding data to the Lovit Results from the 2016 race

INSERT INTO Lovit\_Results(Lovit\_Runner\_ID, Finish\_Time, Finish\_Place, Lovit\_Race\_Year\_ID)

VALUES

(14, dbo.GetDateFromTime('21:52:34'), 1, 2),

(15, dbo.GetDateFromTime('23:37:55'), 2, 2),

(16, dbo.GetDateFromTime('23:44:24'), 3, 2),

(17, dbo.GetDateFromTime('24:31:17'), 4, 2),

(18, dbo.GetDateFromTime('25:26:52'), 5, 2),

(19, dbo.GetDateFromTime('26:44:42'), 6, 2),

(20, dbo.GetDateFromTime('27:28:20'), 7, 2),

(21, dbo.GetDateFromTime('28:14:58'), 8, 2),

(22, dbo.GetDateFromTime('29:07:58'), 9, 2),

(23, dbo.GetDateFromTime('29:28:24'), 10, 2),

(24, dbo.GetDateFromTime('29:28:24'), 11, 2),

(25, dbo.GetDateFromTime('29:41:42'), 12, 2),

(26, dbo.GetDateFromTime('29:45:31'), 13, 2),

(27, dbo.GetDateFromTime('30:34:58'), 14, 2),

(28, dbo.GetDateFromTime('32:12:58'), 15, 2),

(29, dbo.GetDateFromTime('33:08:58'), 16, 2),

(30, dbo.GetDateFromTime('33:08:58'), 17, 2),

(31, dbo.GetDateFromTime('33:45:58'), 18, 2),

(32, null, null,2),

(33, null, null,2),

(34, null, null, 2),

(35, null, null, 2),

(36, null, null, 2)

--Adding data to Lovit\_results table for 2017 results

INSERT INTO Lovit\_Results(Lovit\_Runner\_ID, Finish\_Time, Finish\_Place, Lovit\_Race\_Year\_ID)

VALUES

(37, dbo.GetDateFromTime('22:20:00'), 1, 3),

(38, dbo.GetDateFromTime('22:41:00'), 2, 3),

(39, dbo.GetDateFromTime('23:11:00'), 3, 3),

(40, dbo.GetDateFromTime('23:34:00'), 4, 3),

(41, dbo.GetDateFromTime('25:05:00'), 5, 3),

(42, dbo.GetDateFromTime('26:16:00'), 6, 3),

(43, dbo.GetDateFromTime('27:09:00'), 7, 3),

(44, dbo.GetDateFromTime('27:47:00'), 8, 3),

(45, dbo.GetDateFromTime('27:54:00'), 9, 3),

(46, dbo.GetDateFromTime('28:13:00'), 10, 3),

(47, dbo.GetDateFromTime('28:43:00'), 11, 3),

(48, dbo.GetDateFromTime('30:29:00'), 12, 3),

(49, dbo.GetDateFromTime('39:29:00'), 13, 3),

(50, dbo.GetDateFromTime('30:50:00'), 14, 3),

(51, dbo.GetDateFromTime('31:29:00'), 15, 3),

(52, dbo.GetDateFromTime('31:29:00'), 16, 3),

(53, dbo.GetDateFromTime('31:31:00'), 17, 3),

(54, dbo.GetDateFromTime('31:31:00'), 18, 3),

(55, dbo.GetDateFromTime('31:41:00'), 19, 3),

(56, dbo.GetDateFromTime('33:40:00'), 20, 3),

(57, dbo.GetDateFromTime('33:40:00'), 21, 3),

(58, null, null, 3),

(59, null, null, 3),

(60, null, null, 3),

(61, null, null, 3)

--End of data for Lovit\_Results table regarding year 2017

Select \* From Lovit\_Runner

SELECT \* FROM Lovit\_Results

--Viewing Top Runner's of All Time on LoVit Race

SELECT

Lovit\_Runner.First\_name,

Lovit\_Runner.Last\_name,

dbo.GetTimeStringFromDate(Lovit\_Results.Finish\_Time) as 'Finish Time',

Lovit\_Race\_Year.Race\_Year

FROM Lovit\_Results

JOIN Lovit\_Runner on lovit\_runner.Lovit\_Runner\_ID = Lovit\_results.Lovit\_Runner\_ID

JOIN Lovit\_Race\_Year on lovit\_race\_year.lovit\_race\_year\_id = lovit\_results.lovit\_race\_year\_id

WHERE Finish\_Time is not null

ORDER BY Finish\_Time ASC

SELECT \* FROM Lovit\_Runner

--Finding the total number of Arkansas Runner's

SELECT COUNT (Runner\_State) as 'Out-of-State Runners'

FROM Lovit\_Runner

WHERE Runner\_state <> 'AR'

SELECT COUNT (Runner\_State) as 'AR Runners'

FROM LOVIT\_RUNNER

WHERE Runner\_State = 'AR'

--Finding the average age of competing runner

SELECT AVG (Runner\_Age) as 'Average Age'

FROM Lovit\_Runner

--Finding total number female runners

SELECT COUNT (Runner\_Gender) as 'Females'

FROM Lovit\_Runner

WHERE Runner\_Gender = 'F'

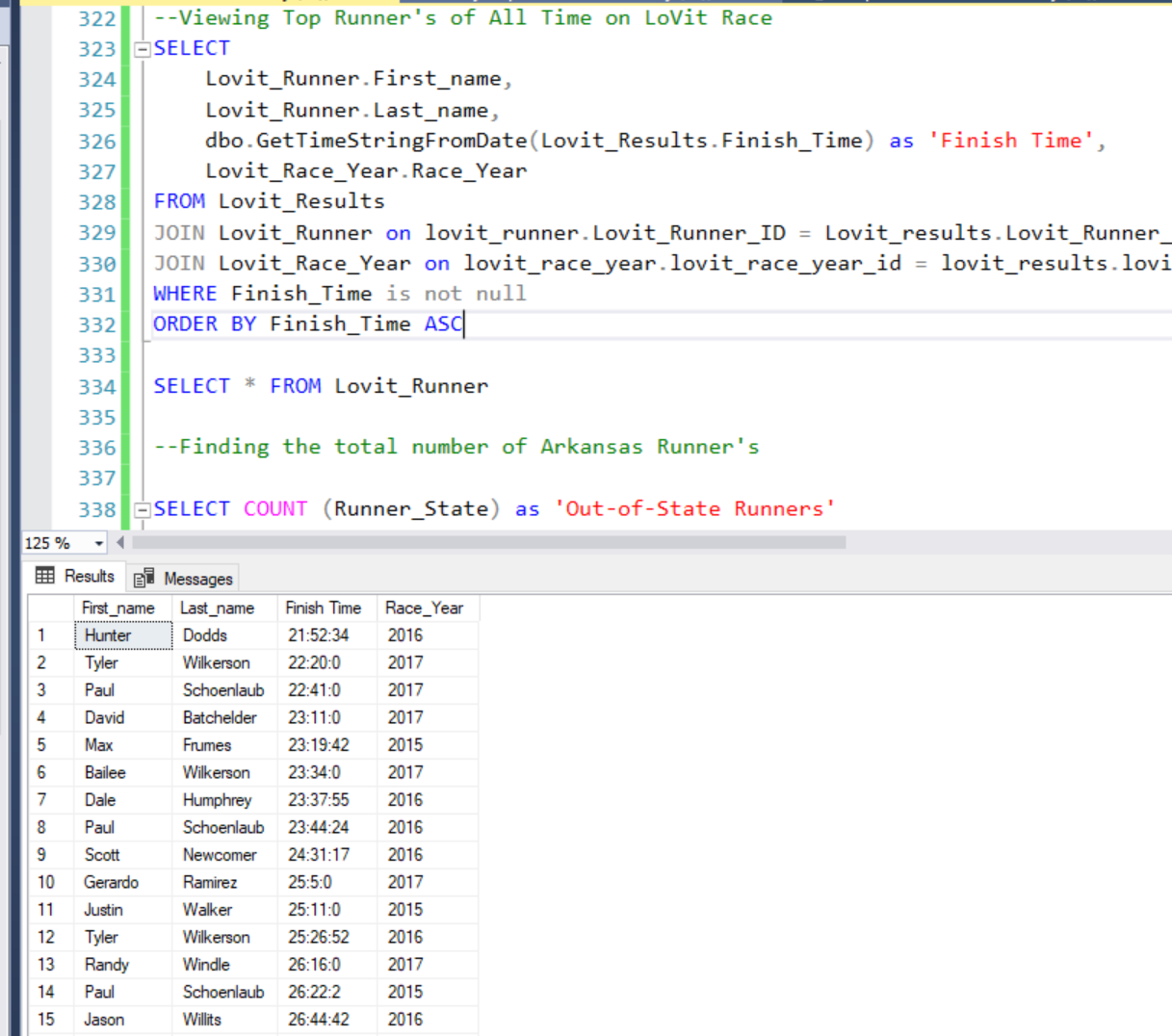
SELECT COUNT (Runner\_Gender) as 'Males'

FROM Lovit\_Runner

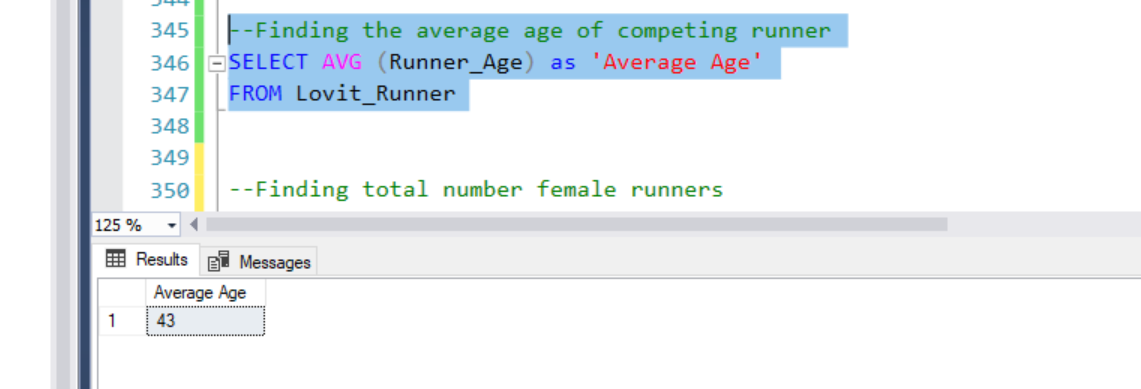
WHERE Runner\_Gender = 'M'

Questions answered by SQL

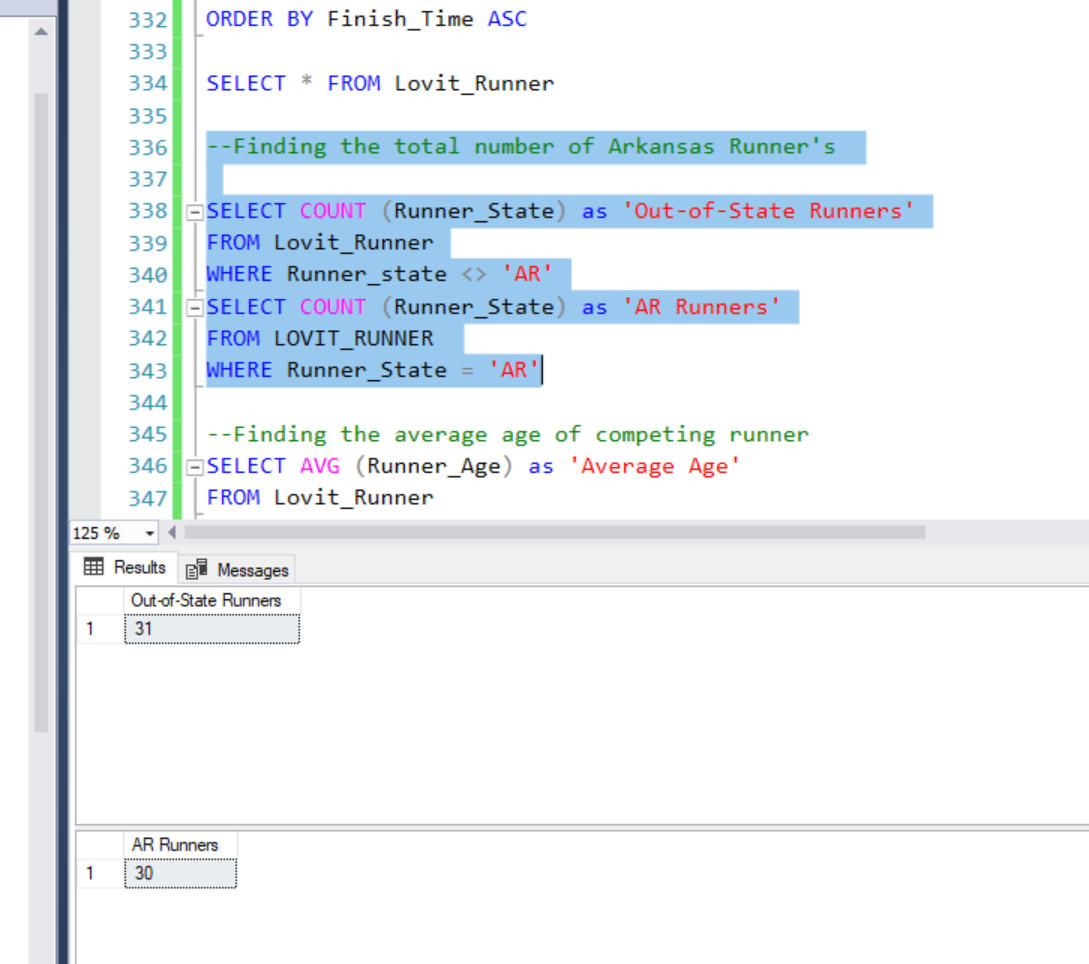
Fastest Lovit Runners



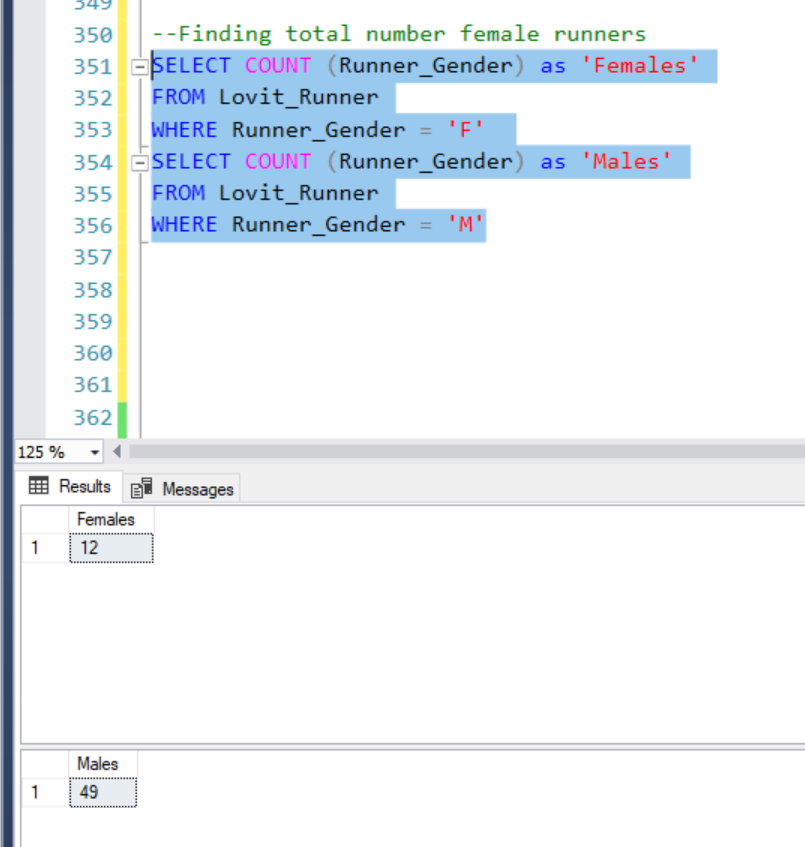
Average Runner Age



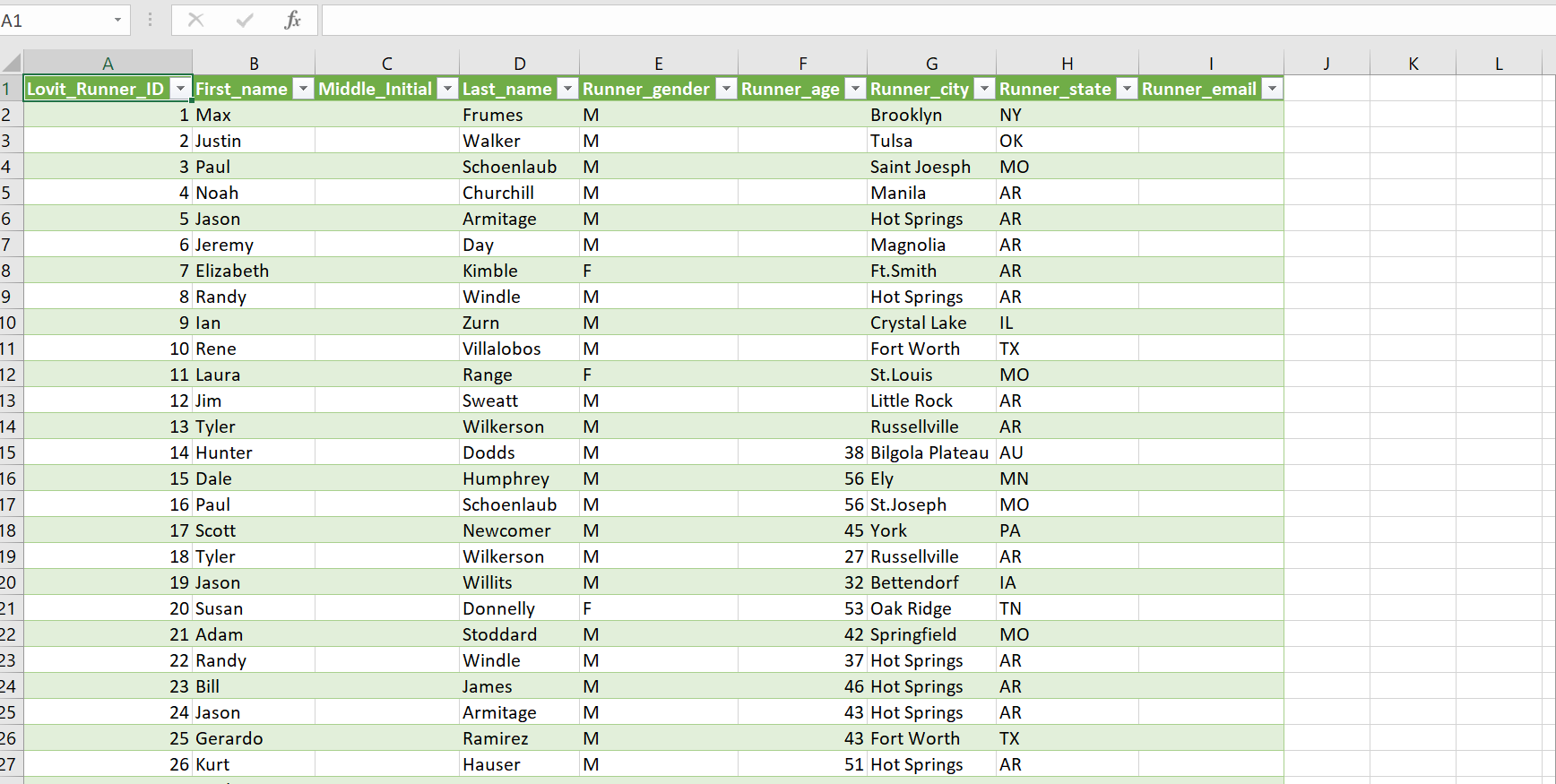
In-State vs Out-Of-State Runners (where should advertisement be placed)



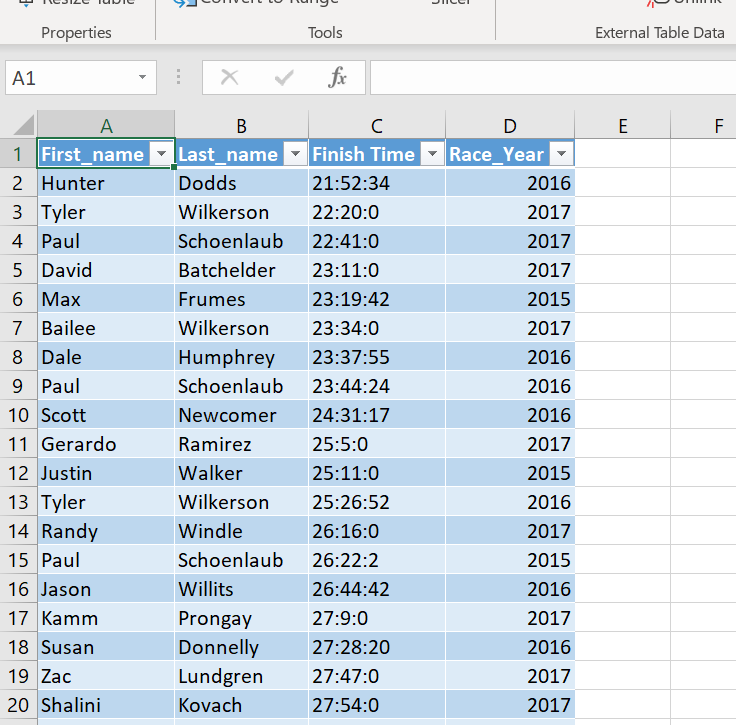
Number of Males vs Females totaled



Data implementation into Excel



Lovit All Time Runners in Excel



Reflection:

There are a few things that I would like to implement into this database to make it more comprehensive for further use that would require working with the race organizers. It would be beneficial to have the runners provide email addresses to be placed into the database to make it easier for contact and spread of information between runners and race organizers. It would also be a good idea to require runners to make a unique login to help store runners individually within the database. While my database allows for redundancy by listing sometimes listing a runner twice, this may or may not be beneficial for the growth of the Lovit organization. It is difficult to know how the organization would like to optimize this database without personally meeting with the organizers to discuss organizational goals.