Stats Project

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Topic and Motivation

- What is the ideal height, weight, and age of Olympic athletes and how do they vary across Swimming and Gymnastics and male and female athletes?
    - Inspired by our love of sports and our group member / Division 1 swimmer Catherine !

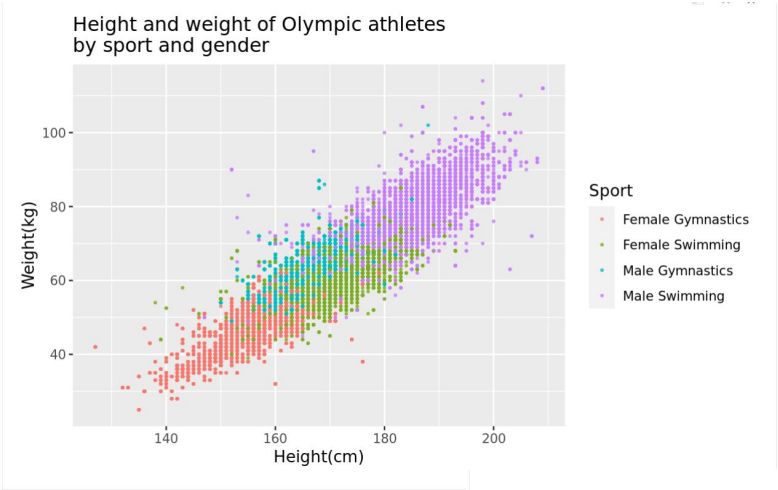
Data Introduction

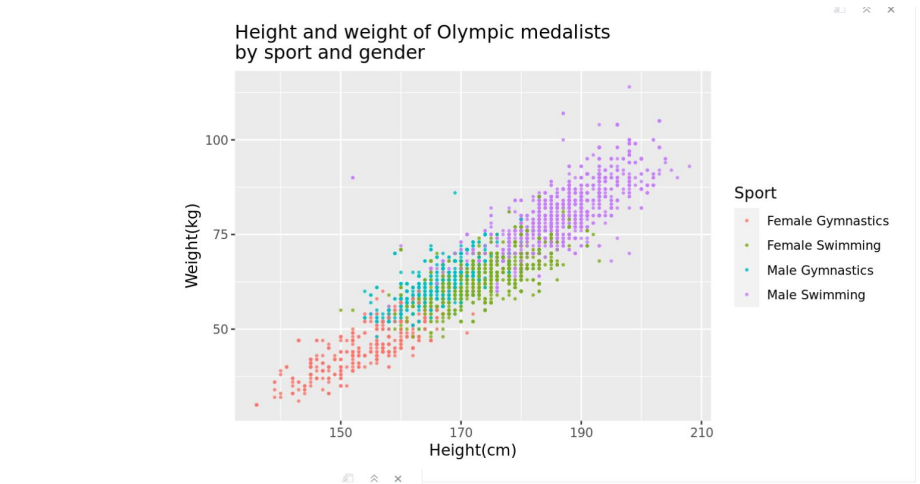
	ID	Name	Sex	Age	Height	Weight	Team	NOC	Games	Year	Season	City	Sport	Event	Medal
1	1	A Dijiang	M	24	180	80.0	China	CHN	1992 Summer	1992	Summer	Barcelona	Basketball	Basketball Men's Basketball	NA
2	2	A Lamusi	M	23	170	60.0	China	CHN	2012 Summer	2012	Summer	London	Judo	Judo Men's Extra-Lightweight	NA
3	3	Gunnar Nielsen Aaby	M	24	NA	NA	Denmark	DEN	1920 Summer	1920	Summer	Antwerpen	Football	Football Men's Football	NA
4	4	Edgar Lindenau Aabye	M	34	NA	NA	Denmark/Sweden	DEN	1900 Summer	1900	Summer	Paris	Tug-Of-War	Tug-Of-War Men's Tug-Of-War	Gold
5	5	Christine Jacoba Aaftink	F	21	185	82.0	Netherlands	NED	1988 Winter	1988	Winter	Calgary	Speed Skating	Speed Skating Women's 500 metres	NA
6	5	Christine Jacoba Aaftink	F	21	185	82.0	Netherlands	NED	1988 Winter	1988	Winter	Calgary	Speed Skating	Speed Skating Women's 1,000 metres	NA
7	5	Christine Jacoba Aaftink	F	25	185	82.0	Netherlands	NED	1992 Winter	1992	Winter	Albertville	Speed Skating	Speed Skating Women's 500 metres	NA
8	5	Christine Jacoba Aaftink	F	25	185	82.0	Netherlands	NED	1992 Winter	1992	Winter	Albertville	Speed Skating	Speed Skating Women's 1,000 metres	NA
9	5	Christine Jacoba Aaftink	F	27	185	82.0	Netherlands	NED	1994 Winter	1994	Winter	Lillehammer	Speed Skating	Speed Skating Women's 500 metres	NA
10	5	Christine Jacoba Aaftink	F	27	185	82.0	Netherlands	NED	1994 Winter	1994	Winter	Lillehammer	Speed Skating	Speed Skating Women's 1,000 metres	NA
11	6	Per Knut Aaland	M	31	188	75.0	United States	USA	1992 Winter	1992	Winter	Albertville	Cross Country Skiing	Cross Country Skiing Men's 10 kilometres	NA
12	6	Per Knut Aaland	M	31	188	75.0	United States	USA	1992 Winter	1992	Winter	Albertville	Cross Country Skiing	Cross Country Skiing Men's 50 kilometres	NA
13	6	Per Knut Aaland	M	31	188	75.0	United States	USA	1992 Winter	1992	Winter	Albertville	Cross Country Skiing	Cross Country Skiing Men's 10/15 kilometres Pursuit	NA
14	6	Per Knut Aaland	M	31	188	75.0	United States	USA	1992 Winter	1992	Winter	Albertville	Cross Country Skiing	Cross Country Skiing Men's 4 x 10 kilometres Relay	NA
15	6	Per Knut Aaland	M	33	188	75.0	United States	USA	1994 Winter	1994	Winter	Lillehammer	Cross Country Skiing	Cross Country Skiing Men's 10 kilometres	NA
16	6	Per Knut Aaland	M	33	188	75.0	United States	USA	1994 Winter	1994	Winter	Lillehammer	Cross Country Skiing	Cross Country Skiing Men's 30 kilometres	NA
17	6	Per Knut Aaland	M	33	188	75.0	United States	USA	1994 Winter	1994	Winter	Lillehammer	Cross Country Skiing	Cross Country Skiing Men's 10/15 kilometres Pursuit	NA
18	6	Per Knut Aaland	M	33	188	75.0	United States	USA	1994 Winter	1994	Winter	Lillehammer	Cross Country Skiing	Cross Country Skiing Men's 4 x 10 kilometres Relay	NA

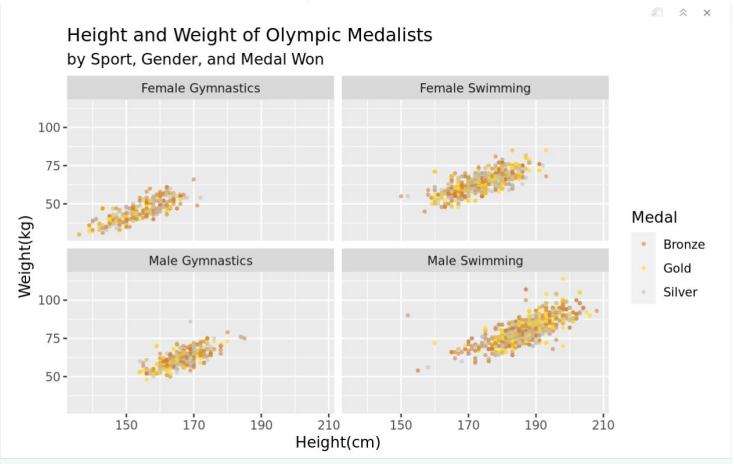
- From www.sports-reference.com via Kaggle
- Originally researched by group of Olympic history enthusiasts, compiled into R by Randi H. Griffin
- Each case corresponds to an individual athlete competing in an individual Olympic event between the years of 1896 and 2016
- Selected variables of interest of sex, age, height, weight, medal, and sport
- Filtered for only the sports of Swimming and Gymnastics

	Sex	Age	Height	Weight	Medal	Sport
1	M	28	175	64	Bronze	Gymnastics
2	M	28	175	64	Gold	Gymnastics
3	M	28	175	64	NA	Gymnastics
4	M	28	175	64	Gold	Gymnastics
5	M	28	175	64	NA	Gymnastics
6	M	28	175	64	NA	Gymnastics
7	M	28	175	64	NA	Gymnastics
8	M	28	175	64	Gold	Gymnastics
9	M	32	175	64	NA	Gymnastics
10	M	32	175	64	Bronze	Gymnastics
11	M	32	175	64	NA	Gymnastics
12	M	32	175	64	NA	Gymnastics
13	M	32	175	64	NA	Gymnastics
14	M	32	175	64	NA	Gymnastics
15	M	32	175	64	NA	Gymnastics

Highlights from Exploratory Data Analysis





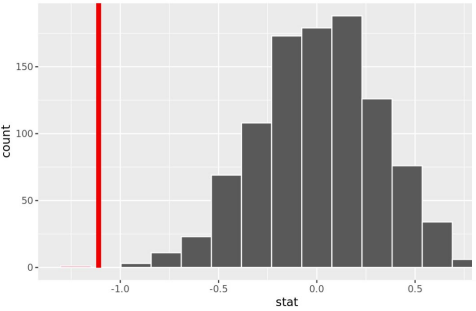


Inference and Modeling

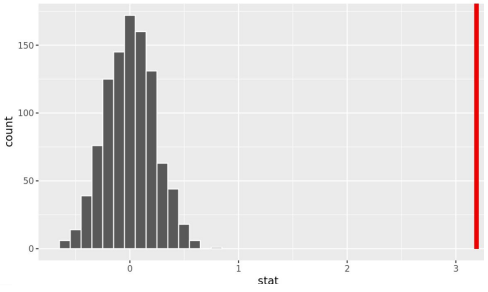
We performed hypothesis tests comparing the means of physical attributes of height, weight, and age of medal vs. non-medal winners of the four sport/gender combinations.

- There was strong evidence (p-value < 0.01) to support a difference in means between medal and non medal winners for every physical attribute-sport-gender combination except the age of male gymnasts (11 out of 12 individuals hypothesis tests).
- In regards to height, male and female gymnasts who won medals were shorter than the respective non medal winners, while male and female swimmers who won medals were taller than the respective non medal winners.
- In regards to weight, male and female gymnasts who won medals were lighter than the respective non medal winners, while male and female swimmers who won medals were heavier than the respective non medal winners.
- In regards to age, male and female gymnasts and swimmers who won medals were older than the respective non medal winners.

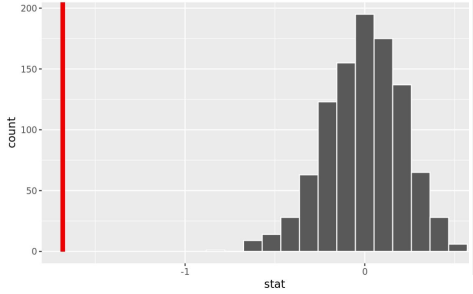
Height of Female Gymnasts



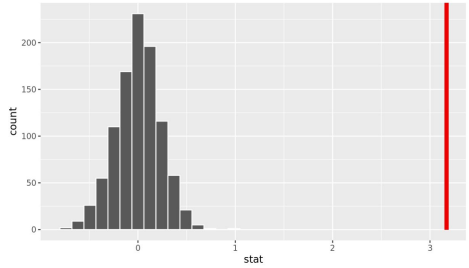
Height of Female Swimmers



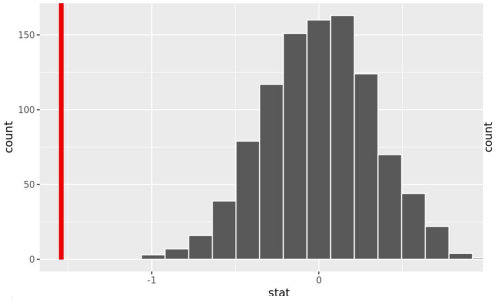
Height of Male Gymnasts



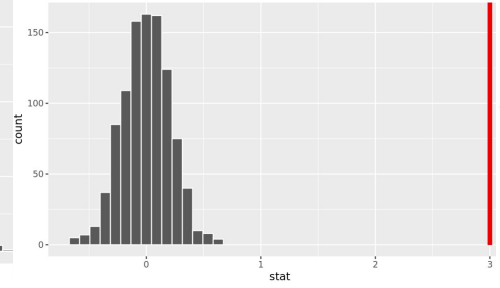
Height of Male Swimmers



Weight of Female Gymnasts



Weight of Female Swimmers



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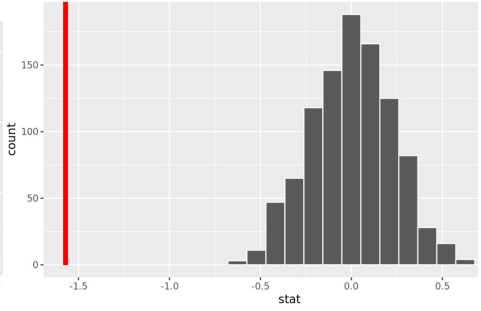

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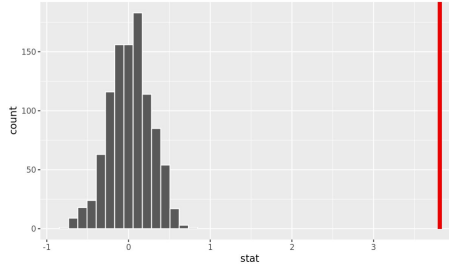
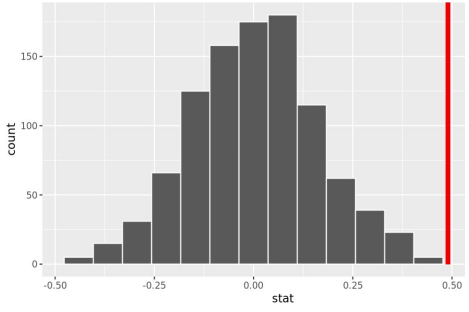
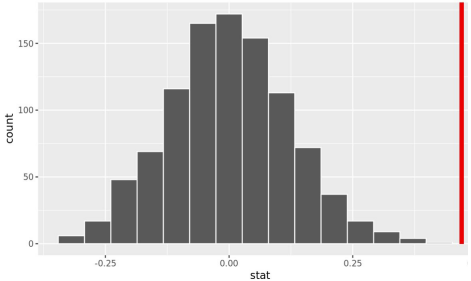


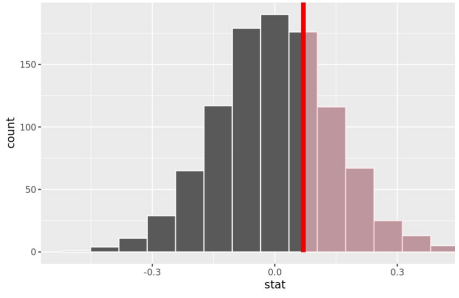
Age of Female Gymnasts



Age of Female Swimmers



Age of Male Gymnasts



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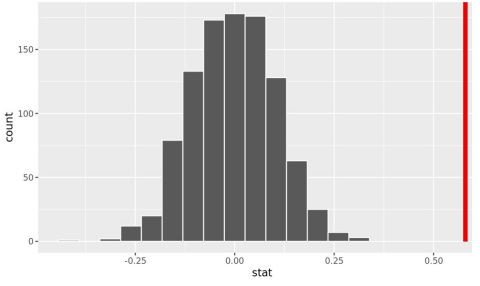

Conclusions and Future Work

- Our data showed that there was evidence statistical difference in the ideal body height, weight, and age to win a medal, as well as that this body type was different across the sports of Swimming and Gymnastics, and across genders.
    - Main conclusions came from the hypothesis tests on the previous slide
    - Interestingly, age was less of a factor for medal winning than it was in the overall olympic participation
- Further questions may expand into looking at predictions for the success in a given sport based on body type