

Softball 2022 Hitting: AUM vs. Gulf South Conference

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In 2022, the softball team representing Auburn University at Montgomery were regular season and tournament champions in the Gulf South Conference. They went on to become NCAA regional champions and super-regional champions, and went on to Denver to represent AUM(Auburn University at Montgomery) at the NCAA D2 Softball World Series.

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This project will analyze overall Gulf South Conference(GSC) hitter through a method of sabermetrics to explore trends that led to how AUM became 2022 Conference Champions. This presentation will compare statistics to compare the year's offensive performance between AUM and GSC listed from data scraped directly from the Gulf South Conference's own website.Furthermore, AUM and UAH(University of Alabama-Huntsville) will be directly compared, since the teams faced off in th GSC tournament final and the NCAA Super Regional final.

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My hypothesis is that the hitting data will present trends that indicate how AUM dominated their competition. It should be noted that defensive and pitching data are not currently being analyzed in this project. Thus, if the hypothesis is significantly contradicted this could be pointing to that the defensive/pitching could explain AUM's success. Likely through analysis beyond the current scope of this presentation, all three categories play key roles in the 2022 season.

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Sabermetrics

In sports analytics, sabermetrics (originally SABRmetrics) is the empirical analysis of baseball, especially baseball statistics that measure in-game activity. Sabermetricians collect and summarize the relevant data from this in-game activity to answer specific questions. The term is derived from the acronym SABR, which stands for the Society for American Baseball Research, founded in 1971. The term “sabermetrics” was coined by Bill James, who is one of its pioneers and is often considered its most prominent advocate and public face.(SOURCE: WIKIPEDIA)

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Definitions provided by mlb.com

Batting Average(AVG)-

batting average is determined by dividing a player's hits by his total at-bats for a number between zero (shown as .000) and one (1.000)

On-base Plus Slugging(OPS)-

adds on-base percentage and slugging percentage to get one number that unites the two. It's meant to combine how well a hitter can reach base, with how well he can hit for average and for power

At Bat(AB)-

An official at-bat comes when a batter reaches base via a fielder's choice, hit or an error (not including catcher's interference) or when a batter is put out on a non-sacrifice. (Whereas a plate appearance refers to each completed turn batting, regardless of the result.)

Run(R)-

A player is awarded a run if he crosses the plate to score his team a run

Hit(H)-

credited to a batter when the batter safely reaches or passes first base after hitting the ball into fair territory with neither the benefit of an error nor a fielder's choice

Double(X2B)-

A batter is credited with a double when he hits the ball into play and reaches second base without the help of an intervening error or attempt to put out another baserunner

Triple(X3B)-

a triple occurs when a batter hits the ball into play and reaches third base without the help of an intervening error or attempt to put out another baserunner

Home Run(HR)-

A home run occurs when a batter hits a fair ball and scores on the play without being put out or without the benefit of an error

Runs Batted In(RBI)-

A batter is credited with an RBI in most cases where the result of his plate appearance is a run being scored. There are a few exceptions, however. A player does not receive an RBI when the run scores as a result of an error or ground into double play.

Total Bases(TB)-

Total bases refer to the number of bases gained by a batter through his hits. A batter records one total base for a single, two total bases for a double, three total bases for a triple and four total bases for a home run

Slugging Percentage(SLG%)-

Slugging percentage represents the total number of bases a player records per at-bat. Unlike on-base percentage, slugging percentage deals only with hits and does not include walks and hit-by-pitches in its equation

Walk(BB)-

A walk (or base on balls) occurs when a pitcher throws four pitches out of the strike zone, none of which are swung at by the hitter. After refraining from swinging at four pitches out of the zone, the batter is awarded first base

Hit By Pitch(HBP)-

A hit-by-pitch occurs when a batter is struck by a pitched ball without swinging at it. He is awarded first base as a result. Strikes supersede hit-by-pitches, meaning if the umpire rules that the pitch was in the strike zone or that the batter swung, the HBP is nullified.

Strikeout(SO)-

A strikeout occurs when a pitcher throws any combination of three swinging or looking strikes to a hitter. (A foul ball counts as a strike, but it cannot be the third and final strike of the at-bat. A foul tip, which is caught by the catcher, is considered a third strike.)

##Ground-rule Double Play(GDP)- occurs when a player hits a ground ball that results in multiple outs on the bases. The most common double plays are ground balls where a forceout is made on the player running from first to second base, then another forceout is made on the batter running to first base.

On Base Percentage(OB%)-

OB% refers to how frequently a batter reaches base per plate appearance. Times on base include hits, walks and hit-by-pitches, but do not include errors, times reached on a fielder's choice or a dropped third strike

Sacrifice fly(SF)-

A sacrifice fly occurs when a batter hits a fly-ball out to the outfield or foul territory that allows a runner to score. The batter is given credit for an RBI.

Sacrifice hit (SH)-

A sacrifice bunt occurs when a player is successful in his attempt to advance a runner (or multiple runners) at least one base with a bunt. In this vein, the batter is sacrificing himself (giving up an out) in order to move another runner closer to scoring.

Data Summary

##	Player	School	AVG	OPS	AB	R	H	X2B	X3B	HR	RBI	TB
## 1	Teala Howard	West Florida	0.435	1.097	168	46	73	9	6	4	19	106
## 2	R.J. Janke	West Georgia	0.434	1.378	76	14	33	8	0	9	29	68
## 3	Cassie Matlock	West Alabama	0.423	1.104	168	48	71	13	6	3	37	105
## 4	Shelby Booker	Alabama Huntsville	0.420	0.997	188	52	79	5	7	1	23	101
## 5	Sierra Easterwood	Montevallo	0.395	1.364	162	52	64	14	4	20	59	146
## 6	Kaylee Vaught	Alabama Huntsville	0.393	1.030	196	44	77	14	4	6	43	117

##	SLG.	BB	HPB	SO	GDP	OB.	SF	SH
## 1	0.631	4	6	11	0	0.466	0	0
## 2	0.895	6	3	13	0	0.483	2	0
## 3	0.625	19	2	12	0	0.479	3	2
## 4	0.537	10	4	14	0	0.460	0	8
## 5	0.901	20	4	14	0	0.463	4	1
## 6	0.597	16	0	16	1	0.433	3	0

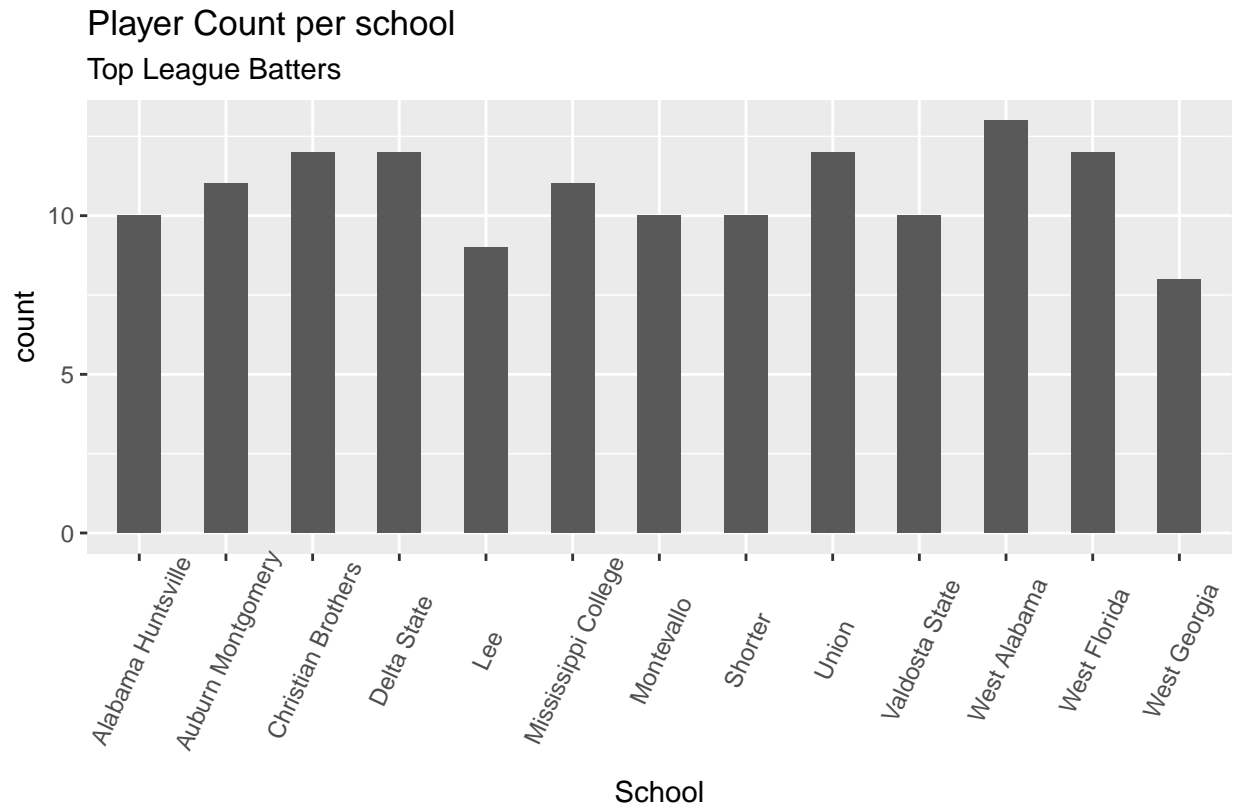
##	Player	School	AVG	OPS
##	Length:140	Length:140	Min. :0.0830	Min. :0.3740
##	Class :character	Class :character	1st Qu.:0.2425	1st Qu.:0.6580
##	Mode :character	Mode :character	Median :0.2810	Median :0.7775
##			Mean :0.2821	Mean :0.7952
##			3rd Qu.:0.3160	3rd Qu.:0.9032
##			Max. :0.4350	Max. :1.3780

##	AB	R	H	X2B
##	Min. : 16.0	Min. : 1.00	Min. : 2.00	Min. : 0.000
##	1st Qu.: 85.0	1st Qu.:13.00	1st Qu.:22.00	1st Qu.: 2.000
##	Median :120.0	Median :22.00	Median :34.00	Median : 5.000
##	Mean :113.1	Mean :22.81	Mean :33.49	Mean : 5.807
##	3rd Qu.:141.0	3rd Qu.:31.00	3rd Qu.:43.00	3rd Qu.: 9.000
##	Max. :196.0	Max. :52.00	Max. :79.00	Max. :18.000
##	X3B	HR	RBI	TB
##	Min. :0.0000	Min. : 0.000	Min. : 0.00	Min. : 3.00
##	1st Qu.:0.0000	1st Qu.: 0.750	1st Qu.:10.00	1st Qu.: 33.00
##	Median :0.0000	Median : 2.000	Median :19.00	Median : 48.00
##	Mean :0.9286	Mean : 3.471	Mean :20.71	Mean : 51.57
##	3rd Qu.:1.0000	3rd Qu.: 6.000	3rd Qu.:27.25	3rd Qu.: 68.00
##	Max. :7.0000	Max. :20.000	Max. :59.00	Max. :146.00
##	SLG.	BB	HPB	SO
##	Min. :0.1540	Min. : 0.00	Min. : 0.000	Min. : 0.00
##	1st Qu.:0.3362	1st Qu.: 7.00	1st Qu.: 1.000	1st Qu.:12.00
##	Median :0.4290	Median :12.50	Median : 2.000	Median :16.50
##	Mean :0.4300	Mean :13.16	Mean : 2.714	Mean :17.28
##	3rd Qu.:0.5165	3rd Qu.:18.00	3rd Qu.: 4.000	3rd Qu.:22.25
##	Max. :0.9010	Max. :42.00	Max. :17.000	Max. :34.00
##	GDP	OB.	SF	SH
##	Min. :0.0000	Min. :0.1880	Min. :0.00	Min. : 0.000
##	1st Qu.:0.0000	1st Qu.:0.3160	1st Qu.:0.00	1st Qu.: 1.000
##	Median :0.0000	Median :0.3725	Median :1.00	Median : 2.000
##	Mean :0.4286	Mean :0.3652	Mean :1.25	Mean : 2.814
##	3rd Qu.:1.0000	3rd Qu.:0.4163	3rd Qu.:2.00	3rd Qu.: 4.000
##	Max. :4.0000	Max. :0.5210	Max. :6.00	Max. :13.000

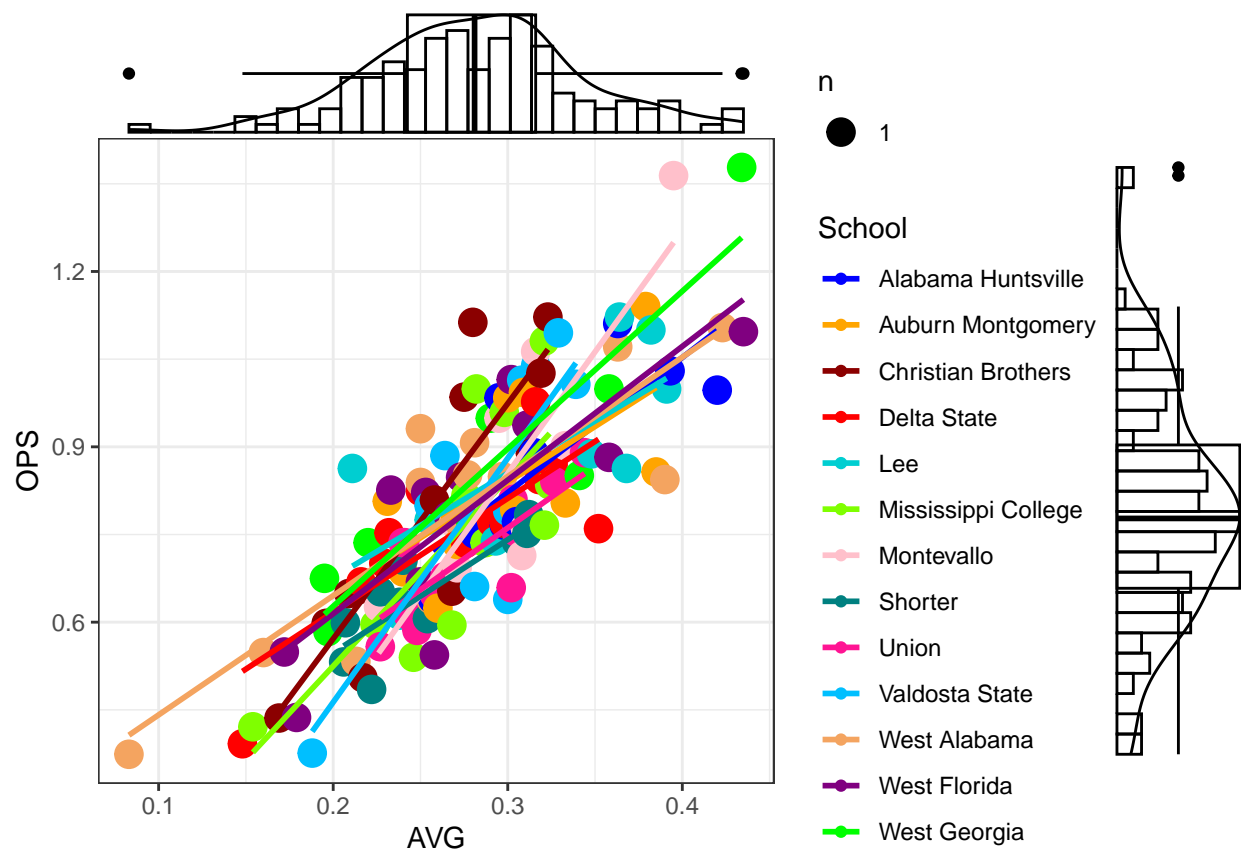
##	AVG	OPS	AB	R	H	X2B	X3B
##	0.0518910	0.1831011	36.3237000	13.3434000	15.5673000	4.4478000	0.0000000
##	HR	RBI	TB	SLG.	BB	HPB	SO
##	2.9652000	13.3434000	26.6868000	0.1349166	8.1543000	2.9652000	8.1543000
##	GDP	OB.	SF	SH			
##	0.0000000	0.0793191	1.4826000	2.9652000			

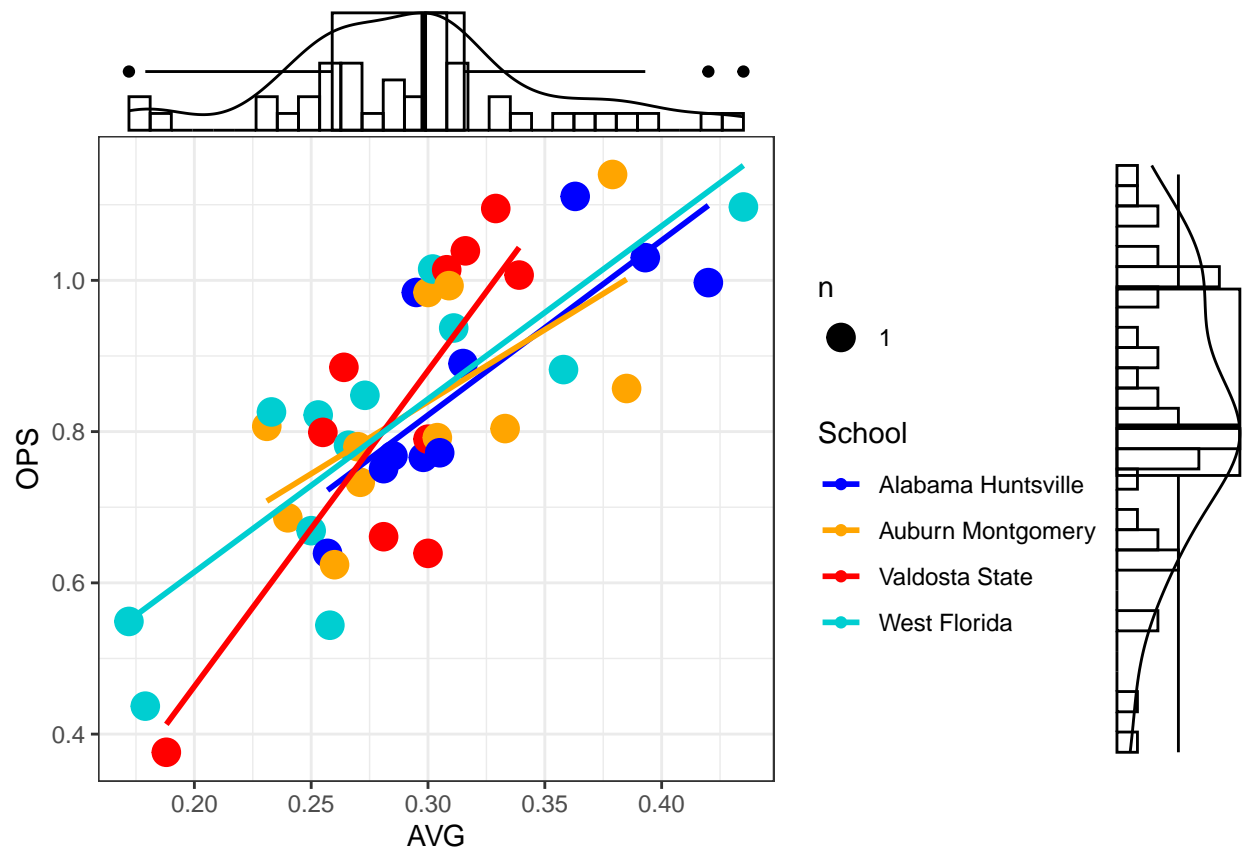
Mean Absolute Deviation

##	AVG	OPS	AB	R	H	X2B	X3B
##	0.0518910	0.1831011	36.3237000	13.3434000	15.5673000	4.4478000	0.0000000
##	HR	RBI	TB	SLG.	BB	HPB	SO
##	2.9652000	13.3434000	26.6868000	0.1349166	8.1543000	2.9652000	8.1543000
##	GDP	OB.	SF	SH			
##	0.0000000	0.0793191	1.4826000	2.9652000			

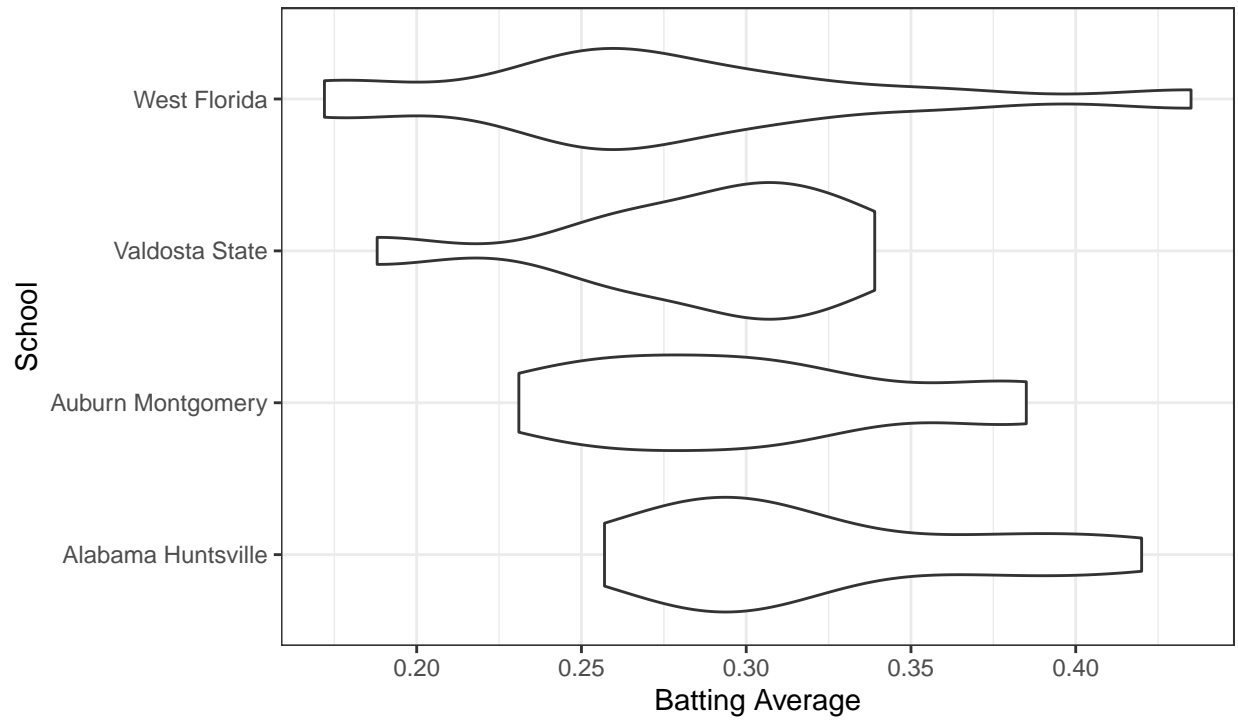


Source: GSC.com



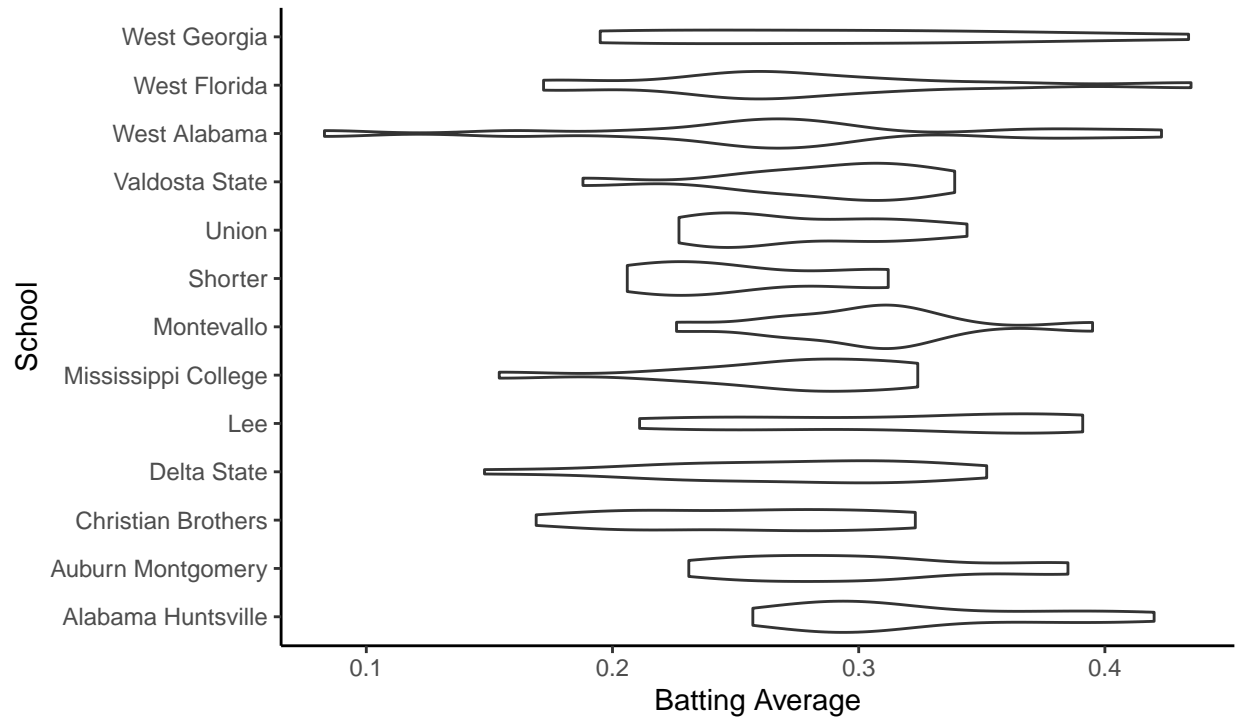


Violin plot
Batting AVG by Team

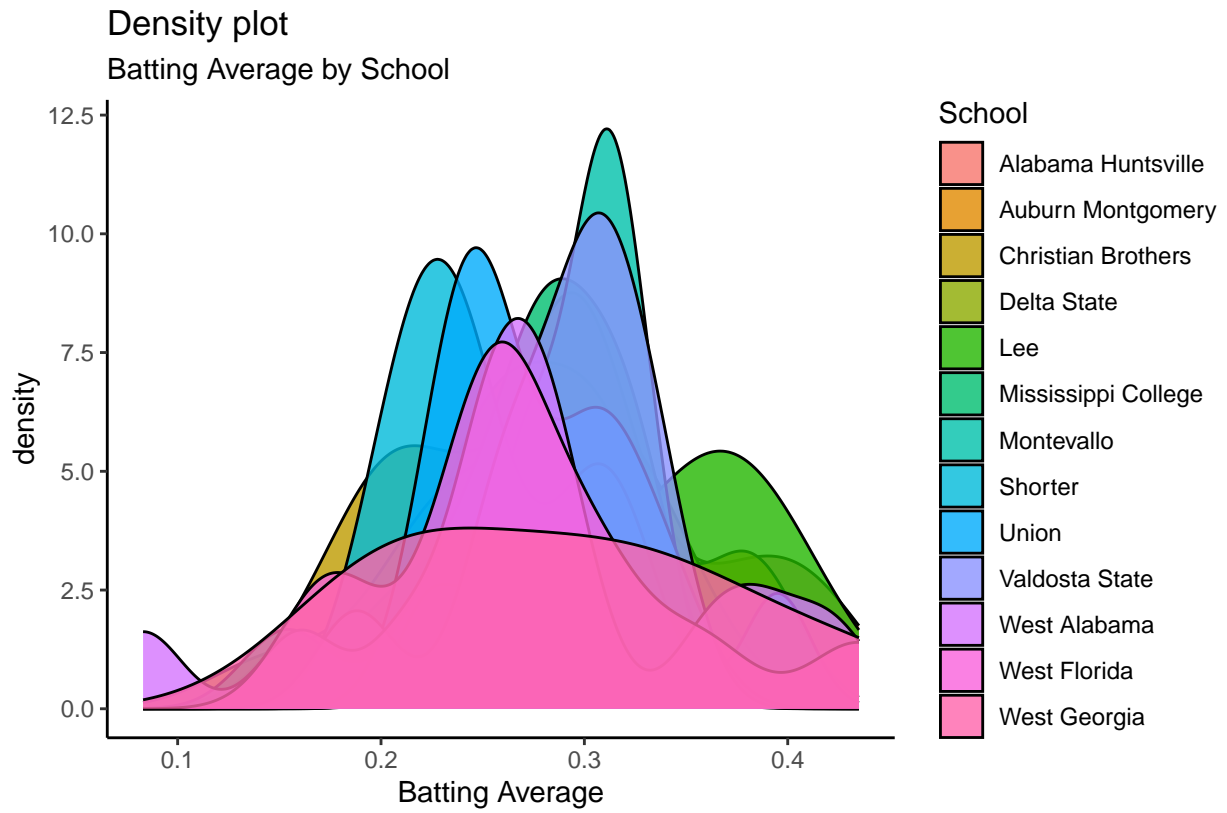


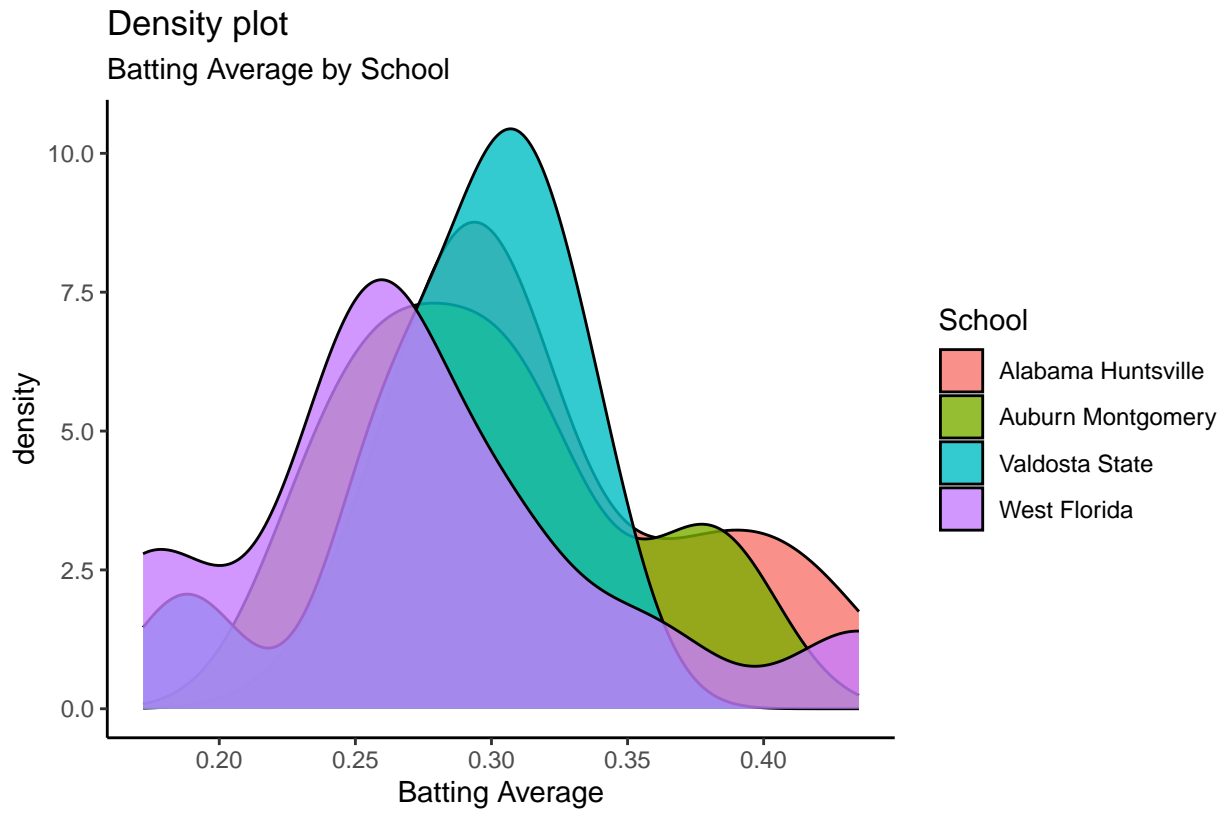
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Violin plot
Batting AVG by Team



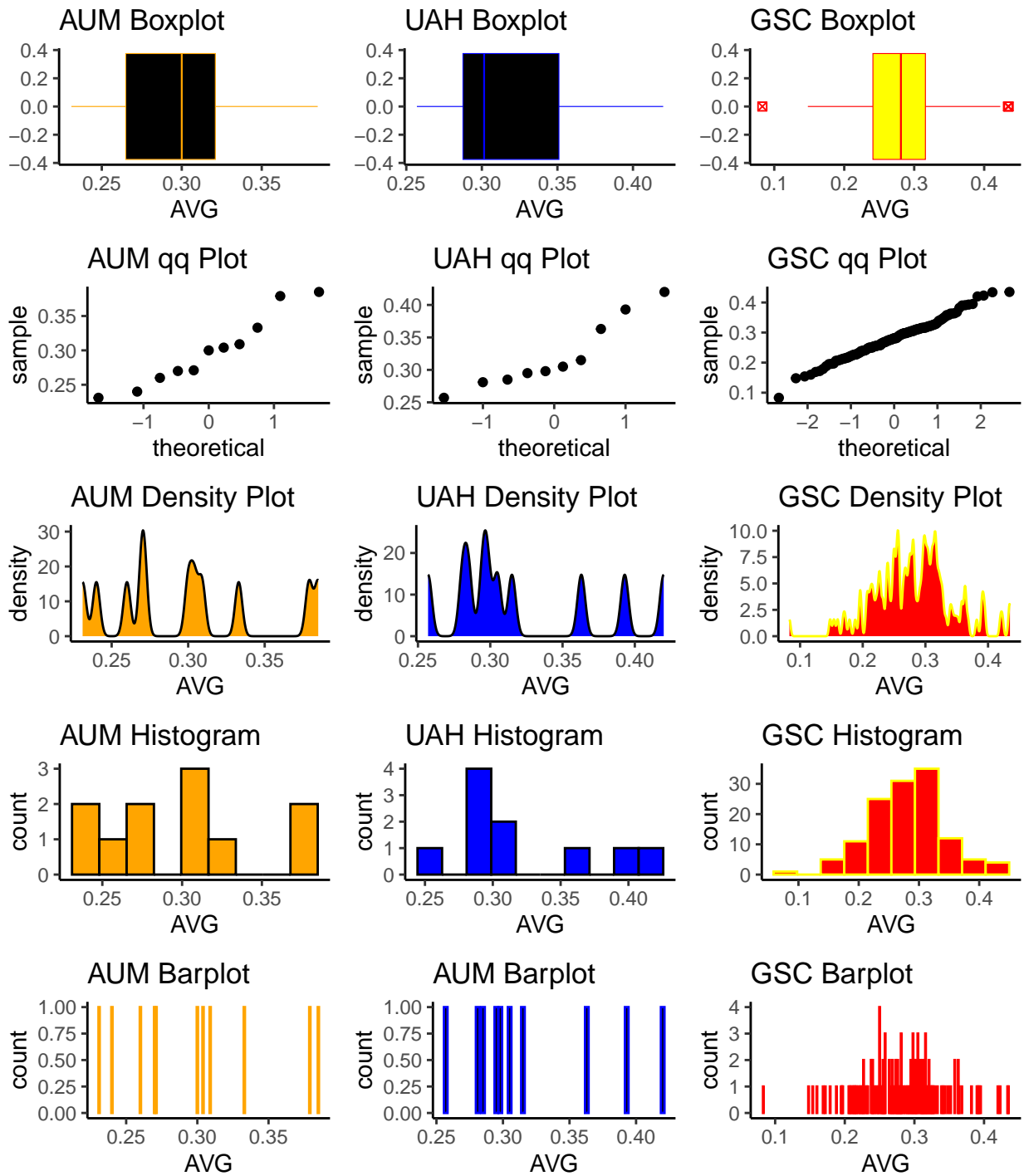
Source: GSC.com





Source: GSC.com

League-wise Batting Average Visualisation



League-wise OPS Visualisation

