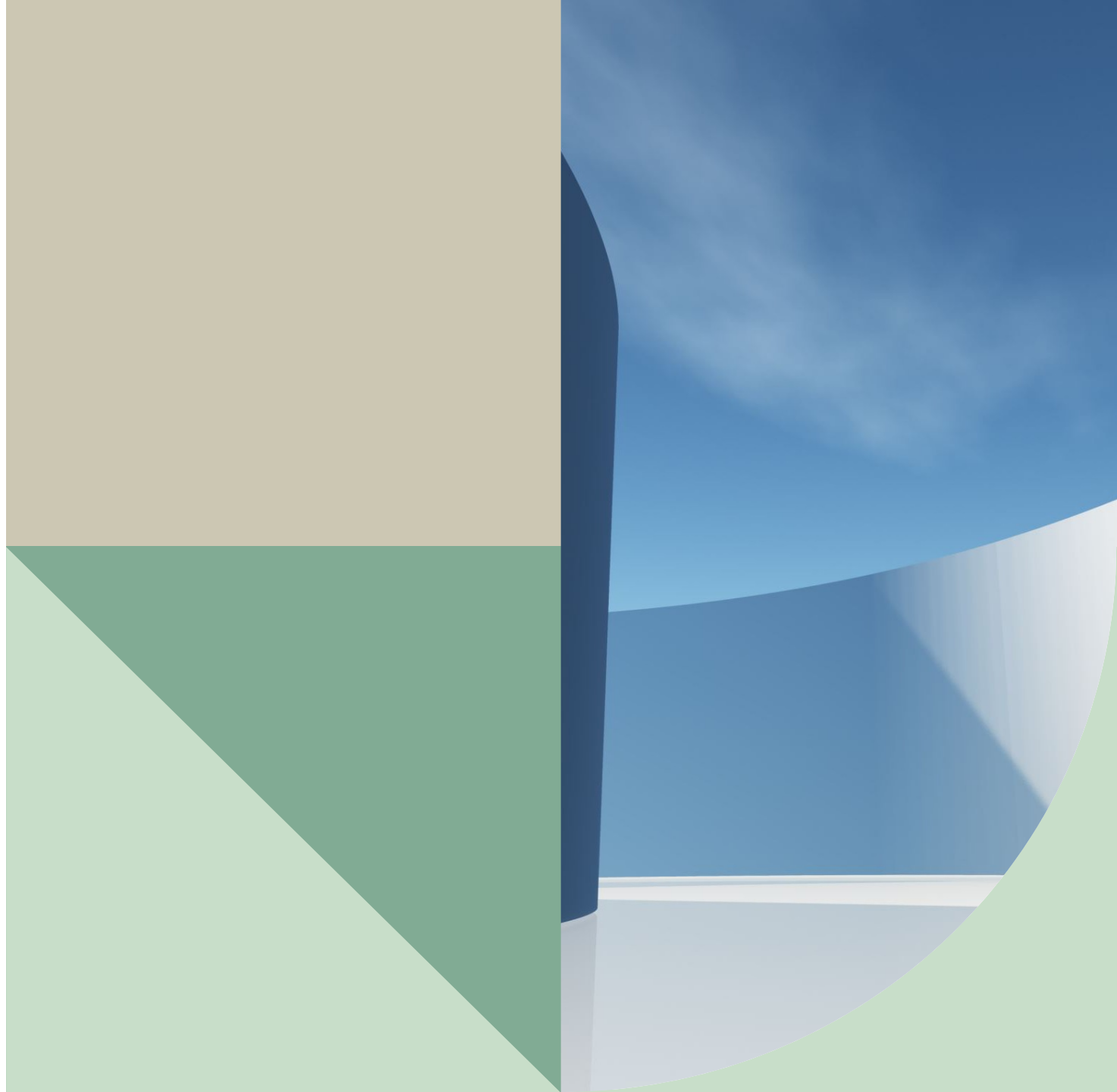# CAPSTONE PROJECT: DATA ANALYSIS ON UFC FEMALE FIGHTERS

NIKI YAW

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A LIL BIT ABOUT ME

- BSC COGNITIVE SCIENCE: COGNITION & BRAIN IN UBC VANCOUVER

- BARISTA

- COVID HOBBY: MUAYTHAI
  - FLEW TO THAILAND FOR A TRAINING CAMP

PROJECT TOPIC: DATA ANALYSIS ON UFC FIGHTS (FEMALE)

- INITIAL DATASETS (2 in total):

- USING 'WEIGHT_CLASS' TO FILTER OUT ONLY FEMALE FIGHTERS

- CSV FILES:

- LIST OF FEMALE FIGHTERS (185 FIGHTERS)

- LIST OF ALL FIGHTS (471 FIGHTS)

FIGHTERS EDA

QUESTION: ARE THE PERFORMANCES EQUAL IN DIFFERENT WEIGHT CLASSES?

STEP 1: DIVIDED FIGHTERS INTO 4 WEIGHTCLASSES

STEP 2: GATHER THE AVERAGE MEANS FOR ALL PERFORMANCE METRICS (GROUP BY DIFFERENT WEIGHT CLASSES)

STEP 3: ONE-WAY ANOVA TEST

```
One-way ANOVA results:
F-statistic: [1.33867908 0.85280467 0.76561458 2.47312008 0.23590353 0.92190972
 1.37586842 0.25416606]
p-value: [0.26329927 0.46676882 0.51469365 0.06317037 0.87125548 0.43140133
 0.2516504  0.85829658]
```

Feather: 61.2-65.8
Bantam: 56.7-61.2
Fly: 52.2-56.7
Straw: -52.2
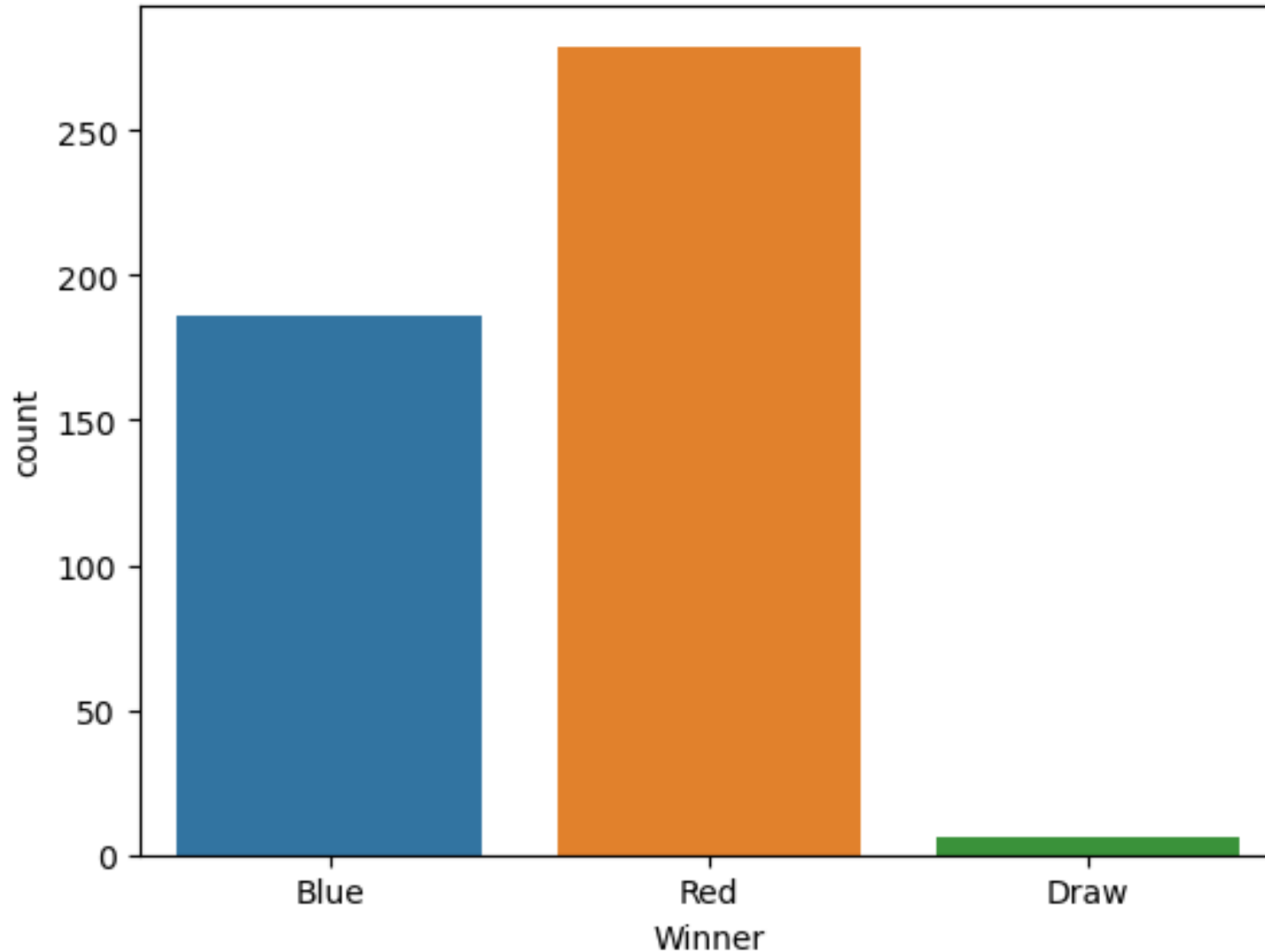
STEP 4: INDEPENDENT T-TEST (FEATHER VS BANTAM)

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Independent t-test (Feather vs Bantam):
t-statistic: [ 0.63166619  1.39872691 -0.88802963  0.09376987  0.76112492  0.39080865
 -0.24433671 -0.42335134]
p-value: [0.5300869  0.16721963 0.37819278 0.92561514 0.44966601 0.69737054
 0.80783236 0.67360471]
```

RESULT:
ALL P-VALUES FOR LARGER THAN 0.05, FAIL TO REJECT NULL HYPOTHESIS.

CONCLUSION: ALL EQUAL!

FIGHT STATS EDA

Red   279
Blue   186
Draw   6

RED corner is assigned to fighters that are more notable (more favored to win).

QUESTION: WHAT IS THE BEST STRATEGY TO WIN A FIGHT?

FIGHT STATS EDA

3 MAIN FIGHTING COMPONENTS: STRIKING, GRAPPLING, DEFENSE

	R_fighter	R_avg_HEAD_landed
209	Karol Rosa	108.000000
136	Joanna Jedrzejczyk	94.875000
50	Yan Xiaonan	88.000000
321	Jessamyn Duke	80.000000
258	Leslie Smith	73.406250
368	Molly McCann	70.875000
235	Irene Aldana	70.625000
89	Jessica Andrade	69.197266
1	Angela Hill	67.764404
431	Roxanne Modafferi	67.000000
	B_fighter	B_avg_HEAD_landed
228	Nicco Montano	138.0
347	Lara Procopio	122.0
83	Syuri Kondo	100.0
324	Jessica Andrade	91.0
17	Inoue Mizuki	86.0
173	Valerie Letourneau	85.0
263	Irene Aldana	84.0
80	Yan Xiaonan	80.0
300	Sarah Kaufman	79.5
260	Lucie Pudilova	77.0

	R_fighter	R_avg_TD_landed
172	Alex Chambers	1.000000
145	Joanna Jedrzejczyk	0.000000
94	Cynthia Calvillo	1.500000
262	Ashlee Evans-Smith	1.500000
286	Amanda Nunes	0.312500
81	Claudia Gadelha	1.562500
82	Alexa Grasso	0.250000
444	Alexis Davis	0.203125
51	Rose Namajunas	0.953125
395	Valentina Shevchenko	2.648438
	B_fighter	B_avg_TD_landed
71	Karolina Kowalkiewicz	0.25000
165	Jessica Aguilar	NaN
48	Nina Ansaroff	0.09375
455	Megan Anderson	0.25000
178	Joanna Jedrzejczyk	0.00000
134	Cortney Casey	0.50000
151	Tecia Torres	0.75000
456	Felicia Spencer	0.75000
123	Randa Markos	1.06250
113	Maryna Moroz	0.25000

	R_fighter	R_avg_opp_HEAD_landed
333	Amanda Nunes	1.000000
74	Polyana Viana	1.000000
100	Tatiana Suarez	1.000000
355	Valentina Shevchenko	1.474609
469	Cristiane Justino	2.000000
443	Kalindra Faria	2.000000
301	Julianna Pena	2.000000
317	Sara McMann	2.500000
295	Ronda Rousey	3.000000
175	Felice Herrig	3.000000
	B_fighter	B_avg_opp_HEAD_landed
440	Mara Romero Borella	0.0
312	Amanda Nunes	0.5
326	Sara McMann	1.0
292	Julianna Pena	1.0
65	Poliana Botelho	2.0
79	Emily Whitmire	2.0
460	Felicia Spencer	2.0
120	Michelle Waterson	2.0
430	Rachael Ostovich	2.0
288	Ashlee Evans-Smith	3.0

ODD: BLUE > RED

Striking is not the most efficient way to win a fight?

MAKE SENSE: RED > BLUE

Grappling seems to be crucial in winning.

VERY SIMILAR

Can't make any assumptions from this.

INTERACTIVE DASHBOARD (EXCEL)

Fighter 1	Name	Amanda Nunes
	Height	1.77
	Weight	65.8
	Age	35
	Stance	Orthodox
Fighter 2	Name	Cat Zingano
	Height	1.71
	Weight	65.8
	Age	40
	Stance	Southpaw
Fighter 3	Name	Cristiane Justino
	Height	1.77
	Weight	65.8
	Age	37
	Stance	Orthodox
Fighter 4	Name	Leah Letson
	Height	1.74
	Weight	65.8
	Age	30
	Stance	(blank)
Fighter 5	Name	Megan Anderson
	Height	1.83
	Weight	65.8
	Age	33
	Stance	Orthodox
Fighter 6	Name	Zarah Fairn
	Height	1.77
	Weight	65.8
	Age	36
	Stance	Orthodox

FEATHER:
61.2 - 65.8
BANTAM:
56.7 - 61.2
FLY:
52.2 - 56.7
STRAW: ~
52.2

Weightclass
- Bantamweight
- Featherweight
- Flyweight
- Strawweight

fighter_name
- Amanda Nunes
- Cat Zingano
- Cristiane Justino
- Duda Santana
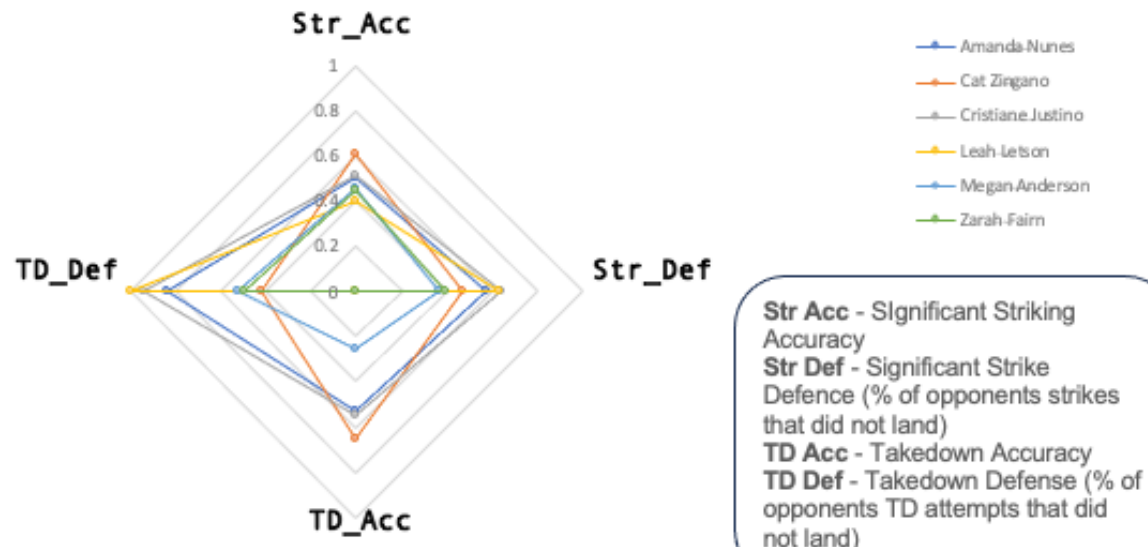- Felicia Spencer
- Leah Letson
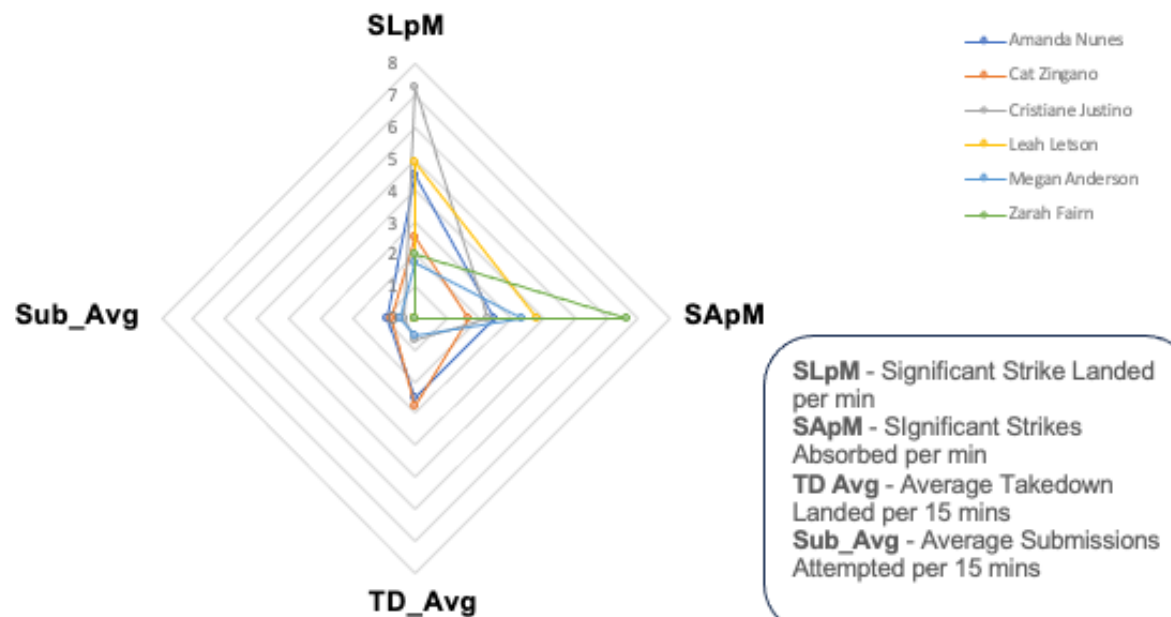- Megan Anderson
- Zarah Fairn
- Aisling Daly
- Aleksandra Albu
- Alex Chambers
- Alexa Grasso
- Alexis Davis

Str Acc - SIgnificant Striking Accuracy
Str Def - Significant Strike Defence (% of opponents strikes that did not land)
TD Acc - Takedown Accuracy
TD Def - Takedown Defense (% of opponents TD attempts that did not land)

*IN PERCENTAGES

SLpM - Significant Strike Landed per min
SApM - SIgnificant Strikes Absorbed per min
TD Avg - Average Takedown Landed per 15 mins
Sub_Avg - Average Submissions Attempted per 15 mins

*IN COUNTS

CHALLENGES

- DATA EXTRACTION FROM RAW DATASETS

- OVERWHELMED WITH COLUMNS (141 COLUMNS)

- DATA ANALYSIS IN FIGHT STATS

- NOT FAMILIAR WITH ABBREVIATIONS & THE MEANING OF THEM

FUTURE IMPROVEMENTS

- ANALYZE:

- FIGHTING STANCE (ORTHODOX, SOUTHPAW, SWITCH)

- FIGHTING STYLES (BJJ, MUAYTHAI ETC.)

- WEIGHTCLASSES

- COME UP WITH A CLASSIFICATION/REGRESSION MODEL TO PREDICT WINNER