Statistical Analysis Project – How do you decide "Who's the Best"???

I will provide you with some data from my track and field athletes, specifically my shot put throwers. You will be required to complete a statistical analysis of the data to determine which thrower is the "best" thrower on the team.

PART 1 - STATISTICAL ANALYSIS

Your statistical analysis will include the following components:

(a) An appropriate data table and a frequency histogram of the data for each thrower
(b) Calculation of the mean, median, mode for each thrower
(c) A five number summary (min, Q1, median, Q3, max), including a box-whisker plot for each thrower

(d) Some form of an appropriate graph that allows you to compare the data from the three throwers on the same graph

PART 2 – DECISION MAKING & JUSTIFYING

Once you have completed the required statistical analysis, you must make a decision as to which thrower is the best. First, you must decide upon what it means to "be the best" thrower. Then you will tell me who is the best and WHY you think that they are the best (your reasoning must be STATISTICALLY based!)

PART 3 – THE THROWERS' DATA

Thrower #1	8.74	8.94	9.66	10.01	10.01	8.43	10.25	10.14	9.04	9.30	8.69
	8.85	9.25	9.46	10.23	8.95	9.65	8.79	10.62	9.78	9.26	9.39
Thrower #2	10.39	10.86	10.94	9.00	9.15	9.35	9.35	8.25	8.85	8.95	9.10
	10.20	9.53	8.76	8.03	8.96	9.25	9.98	10.82	10.10	8.96	9.68
Thrower #3	8.79	9.39	9.94	11.47	9.72	8.49	9.63	9.49	9.83	8.82	9.24
	9.13	9.56	9.94	9.75	9.12	8.96	8.83	9.25	9.38	9.62	9.98

PART 4 - REVISING DECISIONS

Once you have completed your analysis, I will provide with some additional data. You are then required to make an appropriate analysis given the new information and then revise your conclusion, if necessary. Your analysis should include new tables, calculations and graphs. You must be able to STATISTICALLY JUSTIFY your revised conclusion (or your choice to NOT revise your selection.)

Scoring Rubric

Criteria	Developing	Emerging	Proficient	Exemplary
Preparing tables & frequency histograms **(K)**	Intervals are inappropriate Graphs are poorly presented 6 M	Intervals are partially appropriate Graph presentation is partially appropriate 7 M	Intervals are appropriate Graphs are adequately presented 8.5 M	Intervals are appropriate Graphs are properly presented 10 M
Introducing & Presenting tables & frequency histograms **(C)**	Regarding the tables and graphs, NO/MINIMAL effort has been made to introduce WHAT is being presented and WHY it is being presented 0-3 M	Regarding the tables and graphs, SOME effort has been made to introduce WHAT is being presented and WHY it is being presented 3.5 M	Regarding the tables and graphs, GOOD effort has been made to introduce WHAT is being presented and WHY it is being presented 4.25 M	Regarding the tables and graphs, EXCEPTIONAL effort has been made to introduce WHAT is being presented and WHY it is being presented 5 M
Determining mean, median, mode **(K)**	All calculations are mostly incorrect 0-3M	Some calculations are incorrect 3.5M	Most calculations are correct 4.25 M	All calculations are correct 5 M
Introducing & Presenting mean, median, mode **(C)**	NO/MINIMAL effort has been made to introduce WHAT is being presented and WHY it is being presented 0-3M	SOME effort has been made to introduce WHAT is being presented and WHY it is being presented 3.5M	GOOD effort has been made to introduce WHAT is being presented and WHY it is being presented 4.25 M	EXCEPTIONAL effort has been made to introduce WHAT is being presented and WHY it is being presented 5 M
5 Number Summary & BW plot **(K)**	All calculations are mostly incorrect 0-3M	Some calculations are incorrect 3.5M	Most calculations are correct 4.25 M	All calculations are correct 5 M
Introducing & Presenting 5 Number Summary & BW plot **(C)**	NO/MINIMAL effort has been made to introduce WHAT is being presented and WHY it is being presented 0-3M	SOME effort has been made to introduce WHAT is being presented and WHY it is being presented 3.5M	GOOD effort has been made to introduce WHAT is being presented and WHY it is being presented 4.25 M	EXCEPTIONAL effort has been made to introduce WHAT is being presented and WHY it is being presented 5 M

Graphical Comparison **(A)**	You chose an inappropriate graphical method The discussion of the graphical comparison is somewhat correct 0-6 M	You chose an appropriate graphical method The discussion of the graphical comparison is mostly correct and incorporates some your statistical analysis 7 M	You chose the an appropriate graphical method The discussion of the graphical comparison is correct and shows insight and understanding and incorporates most of your statistical analysis 8.5 M	You chose the most appropriate graphical method The discussion of the graphical comparison is correct and shows significant insight and understanding and incorporates all of your statistical analysis 10 M
Introducing & Presenting Graphical Comparison **(C)**	NO/MINIMAL effort has been made to introduce WHAT is being presented and WHY it is being presented 0-3M	SOME effort has been made to introduce WHAT is being presented and WHY it is being presented 3.5M	GOOD effort has been made to introduce WHAT is being presented and WHY it is being presented 4.25 M	EXCEPTIONAL effort has been made to introduce WHAT is being presented and WHY it is being presented 5 M
Defining "the best" **(A)**	You did not attempt to write a definition OR your definition is incorrect 0-3 M	Your definition is correct but does not lead to a correct statistical analysis 3.5 M	Your definition is correct and incorporates a correct statistical analysis 4.25 M	Your definition is correct and incorporates a thorough statistical analysis 5 M
Choosing "the best" **(T)**	Your choice was not justified using your stats OR incorrectly justified using your stats 4 M	Your choice was somewhat correctly justified using your stats 6 M	Your choice was correctly justified using your stats 8 M	Your choice was insightfully justified using your stats 10 M
New data – Adjusting the statistical analysis **(T)**	All new data was inadequately organized & presented You did not correctly take the new data into consideration Discussions about your organization and analysis are incorrect 0-6 M	All new data was adequately organized & presented Most statistical calculations and graphs are correct Discussions about your organization and analysis are mostly correct 7 M	All new data was correctly organized & presented All statistical calculations and graphs are correct Discussions about your organization and analysis are correct 8.5 M	All new data was organized & presented in the most appropriate manner All statistical calculations and graphs are correct Discussions about your organization and analysis are insightful 10 M
New data – Adjusting the selection **(A)**	Your choice was not justified using your new stats OR your choice was incorrect given your statistical analysis 0-3 M	Your choice was somewhat correctly justified using your new stats 3 M	Your choice was correctly justified using new your stats 4 M	Your choice was insightfully justified using your new stats 5 M
TOTAL SCORE	/20 (A)	/20 (C)	/20 (K)	/20 (T)