

Final Report
Faculty Salary Equity Committee

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Executive Summary

Provost Susan Singer charged a working group of faculty and administrators to examine the possible existence of gender- or race/ethnicity-based bias in salaries. The working group convened approximately every three weeks during the academic year 2019-2020. Early meetings were used to agree on the collection of data, selection of appropriate variables to be used in the models, review the literature regarding how salary equity has been examined at other institutions, and develop the methods of analysis.

The faculty salary structure at Rollins College is powerfully influenced by several factors. For approximately the last 20 years the College implemented across-the-board increases typically at 2%, when financial circumstances permit. The salary increase is dependent upon the overall enrollment at the College. Consequently, some years there are no salary increases. During this period the College generally followed a discipline-based approach when hiring new faculty. Second, there are limited opportunities for salary increases. There are one-time salary increases at the time of promotion to associate and full professor. Also, faculty selected as Cornell Distinguished Faculty receive a \$2500 increase in their salary. Beginning in 2016 Rollins adopted a salary model where faculty recruitment in Business, Computer Science, and Economics are largely determined by market forces.

Relying on average or mean-level salary by rank and gender such as provided by AAUP can be distorted by the changing demographic composition of the faculty. Given these considerations the working group used deidentified individual-level salary information to estimate the effect of gender and race while controlling for these other factors. The primary methodology is multivariate regression analysis for the entire CLA faculty (N=191), excluding visiting faculty, adjuncts, lecturers, and Crummer faculty.¹ A series of dichotomous (i.e., dummy) variables are included in the regression models to test for significant effects on factors of interest (gender, race, ethnicity). The empirical analyses were conducted by the Director of Institutional Analytics under the guidance of the faculty/staff task force.

The major results are the following. First, there are some overall differences in salary by gender and race/ethnicity. Aggregate differences in salary are significant by gender for the rank of Professor and Associate Professor, and by race/ethnicity at the rank of Professor. When controlling for other factors however, the dummy variables for gender, race and ethnicity are consistently not statistically significant in all regression models tested (all T-tests failed at the .05 level). In other words, the regression analysis did not reveal evidence of gender-based or race/ethnicity-based bias in salaries, when controlling for other factors. The most influential factors explaining faculty salaries are field/division, years in rank, and promotion to associate or full professor. It is important to note that the working group did not examine compression, inversion, and a comparison of faculty salaries at Rollins to our benchmark institutions. This

¹ A faculty member from Crummer was involved in the analysis but their faculty size was too small to conduct a separate analysis for them.

analysis is currently being conducted by a subcommittee of the Faculty Affairs Committee with the Provost and the Director of Institutional Analytics.

Overall, then the aggregate differences by gender and race/ethnicity appear to be the result of other effects that reflect occupational segregation rather than overt gender pay inequity, with men overrepresented in the more highly paid parts of the faculty, those tenured, with longer careers, and in the market-based salary fields.

Faculty Salary Equity Committee Charge

The Faculty Salary Equity Committee (FSEC) was created to answer questions about potential inequities in faculty salaries by gender and race/ethnicity. The work of the FSEC also responds to the expectation of transparency articulated in the Faculty Salary Philosophy. The group convened in Fall 2019 to develop, conduct, and analyze data to meet the following charge:

The aim of this committee is to establish a systematic, recurring data-driven protocol for examining issues of equity in faculty salaries especially with a primary focus on gender and race/ethnicity of the faculty. This group will design the methodology for a statistical analysis of faculty salaries, as well as help prepare communications about the study to the rest of the faculty and senior leadership. If there is evidence found in the analytical study that an inequity exists in faculty salaries and it is associated with gender, race or ethnicity of the faculty, the committee will provide a recommendation to the Provost.

In addition to identifying current inequities, the group also intends to develop a process and methodology that can be repeated at regular intervals. The committee is a shared-governance approach in which both faculty and professional staff study faculty salary equity together.

Purpose of this study

- Examine faculty salary equity broadly across the College
- Improve understanding of the faculty salary structure
- Determine if there are systemic biases regarding faculty salary equity
- Address perceptions about salary inequity across the campus environment

Faculty Salary System at Rollins College

The history of the faculty salary system at Rollins College exerts significant influence on the distribution of salaries. Rollins briefly followed a merit system for faculty salary increases. The merit system was limited to three years (AY2009-2012). Faculty salary increases at Rollins College are largely determined by two events—one-time only increases attached to promotion in rank and an across the board salary increase each year depending upon fall enrollment. Faculty promoted to the rank of Associate Professor receive an annual salary increase of \$3,500 and faculty promoted to the rank of Professor receive an annual salary increase of \$6,000. (Approved May 2015). Also, faculty who are selected as Cornell Distinguished Faculty receive a one-time only increase of \$2500. The second opportunity for salary increases are across-the-board adjustments made most years. These increases are typically limited to 2%, depending upon the

financial condition of the College and the size of the entering class. Depending upon the financial and enrollment circumstance there may be no across-the-board increase in a given year.

Given that faculty salaries are strongly influenced by two structural conditions—promotion and across-the-board adjustments then aggregate-level analysis can produce distortions. Furthermore, those structural characteristics can move with exogeneous forces such as the changing demographic composition of the faculty. For example, average salary by rank and gender could suggest bias but it may be an artifact of other characteristics that are correlated with gender. Accordingly, the primary method used by the salary equity study committee is multivariate analysis rather than just examining aggregate differences.

Data

The analysis was conducted using salary information for the 2019-2020 academic year. The factors evaluated in the analysis of salaries at Rollins were chosen based upon the models used in the review of literature. Salary data were deidentified. The analysis excludes, Crummer faculty, any faculty in Admin position, any international faculty with no race\ethnicity specified, any other faculty with no race\ethnicity specified, and adjuncts.

List of Variables used in Analysis:

- 1) Base Salary (outcome variable)
- 2) Race (Value = Minority and Non-minority)
- 3) Gender (Female = 1)
- 4) Rank
- 5) Division (for CLA only)
- 6) Years in Current Rank
- 7) Appointment Year and Appointment Decade
- 8) Age at Appointment
- 9) Flag to identify faculty on Tenure or Tenure earning track
- 10) Years in Tenure
- 11) Hire Year and Hire Decade
- 12) Number of years at Rollins College
- 13) Rank at Hire
- 14) Age at Hire
- 15) Pre-Rollins years of experience (sourced from resumes maintained by Dean's office)
- 16) CUPA Market Factor (z-score calculated of average salaries obtained from CUPA-HR salary survey results across the all participating four-year institutions in the nation within all Rollins' relevant disciplines matched with 2-digit and 4-digit CIP disciplines of faculty)
- 17) Flag to identify if faculty has ever been a Cornell Distinguished Faculty
- 18) Flag to identify if Cornell Distinguished Faculty received an additional \$2,500 to base salary

Methodology

- Identified 4 different statistical analysis methods
 - o Multiple Linear Regression with residual analysis
 - o Blinder-Oaxaca Decomposition
 - o Hierarchical Linear Modeling (HLM)
 - o Individual Growth Modeling
- Identified numerous variables used to predict faculty salary (next page)
 - o rank, rank-at-hire, time-in-rank
 - o degree earned
 - o discipline, market factors
- Identified discussions on inclusion/exclusion criteria for sample dataset
 - o tenured/tenure-track, librarians, research/clinical faculty, adjuncts
 - o not to mention, research productivity, service, committee work, teaching load

Exploratory analysis

- Correlation Analysis by Rank
 - o CLA
 - o Crummer
- T-tests for checking equality in means of base salaries by Gender and Race\Ethnicity groups
 - o Null Hypothesis H0 = The mean base salaries received by White or Male faculty are equal (or statistically indifferent) to mean base salaries received by Under-represented or Female faculty.
 - o Alternate Hypothesis H1 = Mean base salaries received by White or Male faculty and Under-represented or Female faculty are not equal.

For each indicator of interest where **Probt** < **0.05** the null hypothesis is rejected and infer that the mean base salaries received by White or Male faculty are not equal to the mean base salaries received by Under-represented or Female faculty (that is, there is no statistically significant difference between under-represented or female faculty salaries and white male faculty salaries).

- Exploration results
 - o The Exploration results Excel file has the detailed results of Correlation analysis and t-test analysis conducted by Institutional Analytics.

- Please feel free to contact Meghal Parikh at mparih@rollins.edu to get access to these results if interested.

Regression Analysis

- Six multivariate regression models were developed:
 - One each with Minority as base category and Female as the base category but excluding Rank and Division of faculty in dependent variables
 - One each as above but after adding Rank as a dependent variable
 - One each as above but after adding Division as a dependent variable
- Regression Model Results: The results of the six models are stored in a shareable Excel file. Please feel free to contact Meghal Parikh at mparih@rollins.edu to get access to these results if interested
- Observations and conclusions
 - All the six models were statistically significant and showed that the variance in faculty base salary is a result of many factors such as number of years in rank, number of years since hiring and Market Factor. However, Race/Ethnicity or Gender does not show as a statistically significant factor that affects faculty base salary in any of the six models.
 - Race/ethnicity and Gender could not be used in any regression models together because it results in extremely low faculty counts in many categories. This can be seen in the Summary Tab in the Regression Model Results Excel file.
 - These modeling results shows the relationship between quantitative factors mentioned above with the CLA faculty base salary. Causation cannot be proved using these regression models. In other words, only the correlation aspect is evaluated. Causation is neither proved nor evaluated in a regression analysis.

Interactive Scatter Plots

- **To observe univariate regression effects of each dependent variable along with Rank and Division bifurcation, interactive scatter plots were developed in the data visualization tool Tableau.**
- Link to dashboard: https://us-east-1.online.tableau.com/#/site/rollinscollegeanalytics/workbooks/673857?:origin=card_share_link
- Please feel free to contact Meghal Parikh at mparih@rollins.edu to get access to these scatter plots if interested. Due to limited number of licenses available, all faculty cannot be given access to the tool at the same time, hence the access will be granted on first-come-first-serve basis for a limited number of days.

Results

Average Salaries by Rank, Gender, and Membership in Under-Represented Group

Figure 1 reports average salary by rank and gender. The average salary difference by gender is significant at the Associate and Professor ranks, with gaps of 14.4% and 13.4%, respectively.

Figure 1

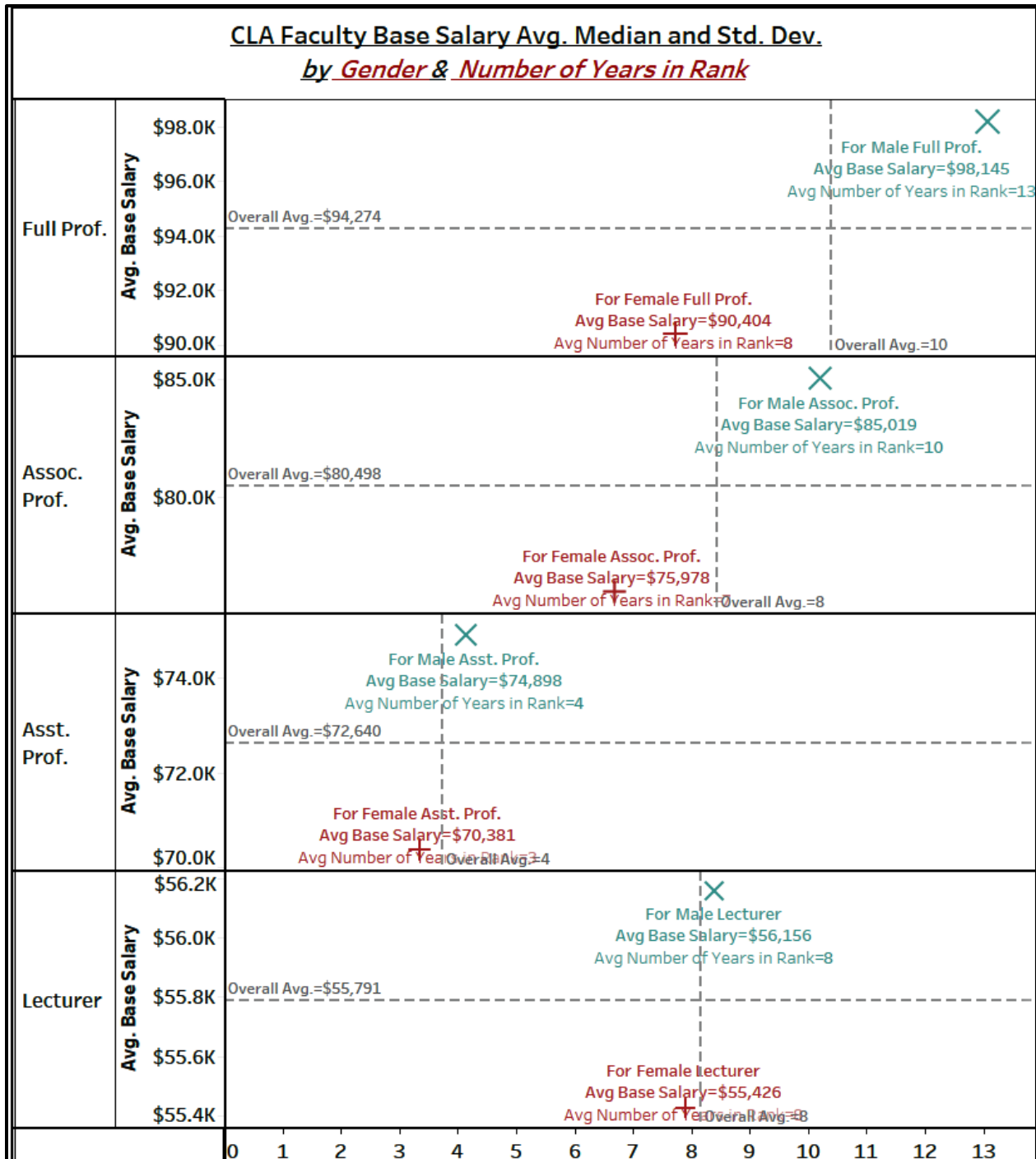
- Average Faculty Salaries by Gender, 2019-2020

	<u>Count</u>		<u>Avg. Base Salary</u>		<u>Median Base Salary</u>		<u>Std. dev. of Base Salary</u>	
	Female	Male	Female	Male	Female	Male	Female	Male
Overall	104	87	\$75,043	\$84,086	\$73,705	\$83,022	\$16,620	\$21,215
Full Prof.	33	32	\$90,404	\$98,145	\$85,047	\$92,954	\$13,676	\$15,687
Assoc. Prof.	22	24	\$75,978	\$85,019	\$73,805	\$77,600	\$6,733	\$17,580
Asst. Prof.	29	21	\$70,381	\$74,898	\$65,400	\$66,186	\$11,188	\$18,865
Lecturer	20	10	\$55,426	\$56,156	\$52,420	\$55,504	\$9,940	\$10,181

Figure 2 presents average salary by gender and rank with average number of years in rank. The average salaries for male associate and full professors are higher compared to female colleagues. However, the average number of years in rank is substantially greater compared to female associate and full professors suggesting that salary differences may be an artifact of demographic factors.

Figure 2

Average Faculty Salaries by Gender and Years in Rank, 2019-2020



Figures 3 and 4 (below) report similar information comparing average salaries and years in rank for white and minority faculty. Results for associate professor and lecturer are withheld due to the small number of cases.

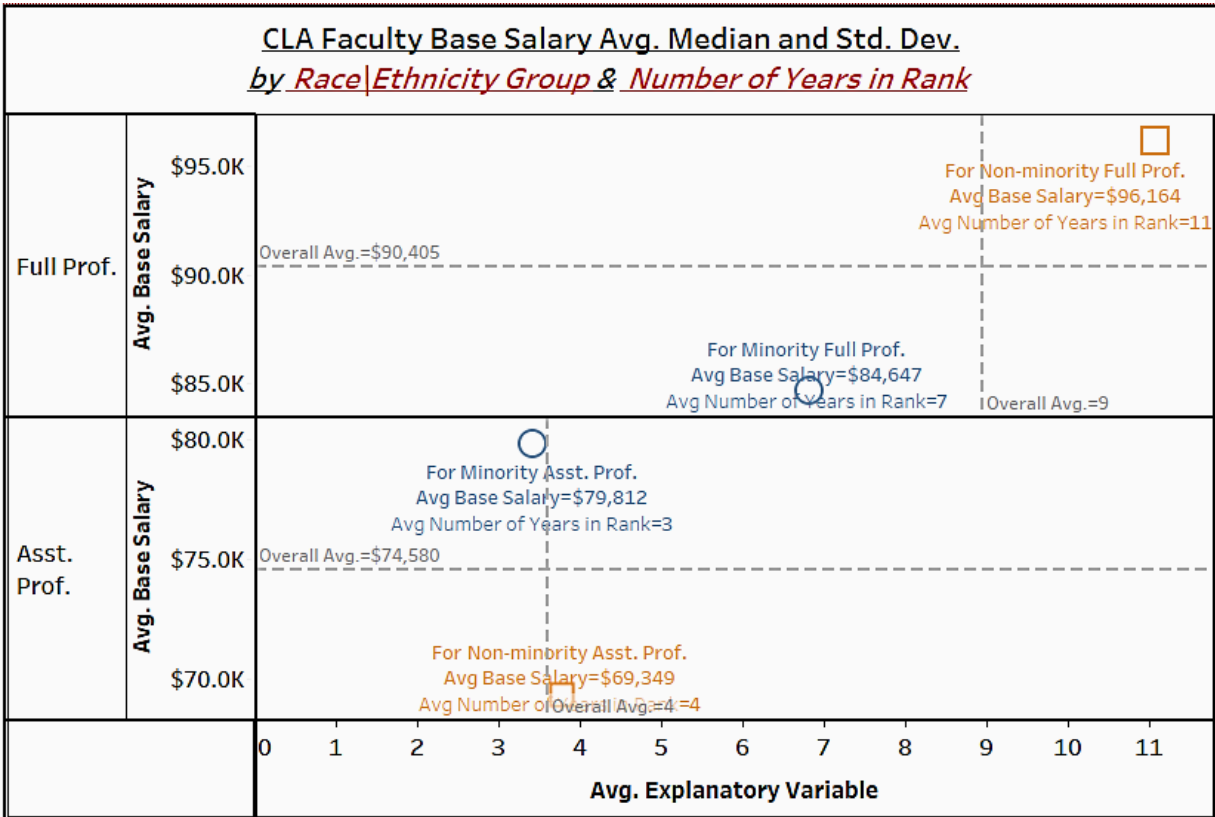
Figure 3

Average Salary for White and Minority Faculty, 2019 – 2020

	<u>Count</u>		<u>Avg. Base Salary</u>		<u>Median Base Salary</u>		<u>Std. dev. of Base Salary</u>	
	Minority	Non-minority	Minority	Non-minority	Minority	Non-minority	Minority	Non-minority
Overall	37	154	\$77,600	\$79,537	\$78,396	\$77,417	\$15,754	\$20,128
Full Prof.	11	54	\$84,647	\$96,164	\$83,022	\$91,078	\$5,183	\$15,726
Assoc. Prof.	7	39	<i>Faculty count too low to display averages</i>					
Asst. Prof.	14	36	\$79,812	\$69,349	\$71,101	\$64,717	\$16,237	\$13,459
Lecturer	5	25	<i>Faculty count too low to display averages</i>					

Figure 4

Average Faculty Salaries by URM and Years in Rank, 2019-2020



** faculty counts too low at the associate and lecturer ranks to display in the chart

Explaining Salary Differences by Gender and Race/Ethnicity: Multivariate Analyses

Figure 1 indicates gender-related salary disparities, however, Figure 2 suggests those disparities may be related to other demographic factors and institutional procedures for awarding across-the-board salary increases. In order to fully account for these more complicated factors we use multivariate regression techniques. Multivariate regression is able to isolate the separate and independent effects for each factor of interest while holding the other variables constant. Further, a multivariate approach allows us to estimate the average effects at the individual-level of analysis instead of relying on aggregate analyses.

The results for the full multivariate regression models are found in the “Modeling Results” attachment in the Appendix. Factors that meet the test of statistical significance ($p < 0.05$) are highlighted. There are three models each for gender and URM membership, using the main independent variables, but then including either 1) CUPA market factor to control for field, 2) rank and CUPA market factor, and 3) rank and division (in lieu of CUPA market factor). Because CUPA market factor is strongly correlated with division, those two variables cannot be used in the same model. Looking at these models together, the regression results show several important outcomes.

First, the significant predictors of base salary are: being tenured/tenure-track, years tenured, age, and division/CUPA factor. Second, once accounting for these factors, gender and race in an under-represented group are not statistically significant in all six models. The results suggest that the patterns illustrated in Figure 1 are results of these other mechanisms. In other words, the overrepresentation of men among Business division faculty, and the most senior faculty, result in an overall difference in pay for women and URMs. (Refer to the Technical Appendix for detailed statistical results and diagnostics.)

Conclusions and Recommendations

Last year the provost convened a committee of faculty and administrators to examine the existence of potential bias in faculty salaries related to gender and/or membership in an under-represented group. The committee reviewed relevant literature regarding appropriate methods used to identify and measure potential salary bias. Based upon the extant professional literature the committee identified 18 independent factors that might influence disparities in base salary. Further, the committee developed a methodology that relied upon multivariate regression to isolate the sources of potential bias while controlling for each independent factor. The analysis and modeling is capable of detecting (gender or race/ethnicity bias in matched pairing (modeled statistically)). Generally, the regression results reveal no evidence of salary bias independently related to sex or membership in an under-represented group, but rather reflects the tendency towards occupational segregation that is mirrored in the larger labor market. The results

identified years in rank, promotion, age at the time of hire, and market considerations to be significant factors that explain approximately 70+% of the variation in base salaries at Rollins College.

The Committee offers the following recommendations. First, the College must remain vigilant regarding the possibility of salary bias. Any faculty member who believes their salary to be inappropriate should direct their concern to the Dean of the Faculty and the Vice-President for Academic Affairs and Provost. Second, the committee recommends that similar faculty salary studies be conducted at regular four-year intervals and the results are communicated to the faculty. Finally, the committee did not investigate the existence of compression, inversion, or competitive market comparisons. We recommend that a separate committee under the authority of the Faculty Affairs Committee conduct this analysis at four-year intervals.

Finally, we believe these results suggest several questions for future discussion and investigation. One question that emerges from the study is why there are fewer women in the rank of full professor with comparable number of years in-rank as males. Is this related to current hiring practices, a naturally occurring generational replacement process nationally, the relative amount of time women spend at the rank of associate professor, or other factors? An additional question for future discussion is how much weight can and should be given to market forces? The committee recognizes that market forces are a reality which cannot be avoided. However, recent changes to salary offer guidelines (that standardized salary offers outside of the three market-based disciplines) have effectively reduced the gender disparities among Assistant Professors. Is it possible to balance the influence of outside markets with our goal to reduce inequalities?

Appendices

(See attached Excel files)

Modeling Results (regression results)

Statistical Exploration Results (diagnostics)

List of References

Articles

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