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November 11, 2003  
First draft  
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### Summary

Students are always trying to find ways to decrease their living expenses because they would like to save money for education, entertainment, or the future. No matter their reasons for saving money, students make an effort to find affordable housing. As a student, I am curious about finding cheaper housing. Therefore, I chose to investigate the factors that are most influential in housing prices. By calling the managers of local apartment buildings and asking a prescribed set of questions, I collected all the necessary data for this project. However, after running a least square regression on the collected data, the overall results of the project are not accurate or useful at all because the answers that I calculated from the equation are 80 dollars more than the actual expenses. Also, there are many unexplainable variables. For example, the rent for apartments that include the utilities is 36 dollars less than for those apartments that do not include utilities. Another strange occurrence is that an additional bathroom decreases the price of the rent by 53 dollars per person.

### Introduction

As an out-of-state student, I am anxious about my living situation around the University of Washington. Many students have the same questions I have when they decide to move out of dormitories to live on their own. I would like to help those students as well as myself to help alleviate this worry. By investigating some factors that will affect the price of an apartment, students will be able to save money on renting

houses around U-District. My goal is to determine what factors influence the price of rent and how.

### Process

Since it is probably inefficient to personally explore and find every apartment around campus, I started collecting classified ads from the Daily newspaper because the managers would be likely to answer my questions and willing to tell me more about their apartments, yet it was still not easy. When I called most of the time, the managers did not answer the phone, were busy, or unwilling to talk to me on the phone. Even though I did have 100 potential managers, only 32 of them answered all of my questions on the phone. Although there should be many factors would influence the price of rent, I decided to narrow my process down to searching for the following factors: number of people sharing the kitchen, number of bathrooms in the apartment, number of bedrooms in the apartment, inclusion or exclusion of the utilities and parking, year of the building's construction, the last time between carpet changes (as a gauge for overall cleanliness), and square feet of the whole living space.

After talking to all the managers on the phone, I went online and used MapQuest to get the distance in miles from the apartment to Schmidt Hall because I was unable to use the local address of any other spot on campus (since most campus buildings don't have local addresses). Also, I divided the rent by the number of rooms in the apartment because I wanted to figure out how much an individual spends on the apartment, which would be a smaller number than the total rent of the apartment. After collecting all the

necessary data, I ran a least square regression on my data (Appendix). This is what I found.

### Result

Unfortunately, the results are not a very good estimator with some unexplainable phenomena. For example, every square foot of the apartment will increase 7 cents of your total rent, which does not seem significant enough because the living space of the apartment should be one of the most influential figures of the price. Also, I found out that for every additional bedroom in your apartment, your individual rent will decrease 55 dollars per person. Even though for every additional person who you live with you will pay less rent on average because of splitting rent, the drop seems very steep. Another phenomenon is for every additional bathroom in the apartment, your individual rent will decrease 53 dollars, which is also too much of a decrease. Moreover, it does not make sense that your rent drops at the same time you get additional features in your apartment. Third, for every mile that is farther away from the campus, the rent actually increases almost 4 dollars. This is the opposite from what I found when I compared price and distance on a one to one basis for each individual apartment. In addition, if the rent did not include the cost of utilities, rent would be 37 dollars more than an apartment that included the utilities. It does not make logical sense that the apartment that includes utilities is actually cheaper than the one that excludes utilities. Lastly, I tried to use two different apartments from the data set. The numbers that were given to me from this regression are 80 dollars more than the actual individual rent. This means the result from the regression is totally off and unusable.

However, the data do show that the years since the buildings construction and cleanness does affect the price of the rent. For every year the building has existed, the rent increases by 58 cents. The reason is that owners will spend more money on maintenance of the building, which causes the overall price to rise. This does make sense, yet it was a surprise because I would image the newer the building was, the higher the rent would be. Carpet is the main source that I chose to determine the cleanness of the building even though the manager told me that they change their carpets depending on the cleanness of the pervious person who lives there. In other word, it has nothing to do with the cleanness of the building. Although it does not prove that the newer the carpet, the higher level of care from the owner, it is true that the price will be higher if your carpet is new. Since one more year of using the same carpet will decrease your rent by 53 cents, you will save at least 5 dollar, if you move to a place where the owner did not change the carpet for 10 years. It is not a bad idea because before you move in the owner will almost always use shampoo to clean up your carpet.

### Improvement

First, I should have more apartments because 32 is not a big enough sample of the population to give an accurate result. I would imagine if I had a bigger population, my results would be closer to the actual rent since some of the numbers are still in the rejection region in the t-test with a 95% confidence interval. Also, I would try to use a different way to measure the distance to the center of the campus. Since now I am not measuring from the center of the campus, (Schmidtz Hall is to the west of the center), accuracy suffered. It is one of the biggest reasons this regression did not work. A third

problem is that I need to find some way of separating shared housing, studio rentals, and actual apartments because shared housing always has a cheaper price while including the expense of utilities, which might be the factor that is making the rent for utilities-included apartments less than rent for utilities-excluded rentals.

### Conclusion

After this experience, even though I did not provide a great estimator to predict rent, the data I gleaned is not worthless. At the very least, it is learned that living with more people and sharing more things, such as a kitchen, will reduce the price of rent. Also, if the data is accurate, it may show that apartment prices may well be set in a more random manner than expected, which would make apartment shopping a much more purposeful and rewarding task, since this would mean that one could find an apartment for much less money than an expensive apartment with similar features.

## Appendix

Dependent Variable: INDIVIDUAL

Method: Least Squares

Date: 11/10/03 Time: 19:25

Sample: 1 32

Included observations: 32

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	622.7917	43.47150	14.32644	0.0000
SIZE	0.071382	0.044925	1.588903	0.1264
BEDROOM	-54.94141	22.99123	-2.389668	0.0259
KIT	-4.855106	2.691063	-1.804159	0.0849
BA	-52.86463	19.98609	-2.645071	0.0148
DISTANCE	4.849474	13.93765	0.347941	0.7312
PARK	23.56666	31.22019	0.754853	0.4583
YEARS	0.575868	0.555421	1.036813	0.3111
CLEAN	-0.527278	4.078277	-0.129289	0.8983
UTILITIES	-36.56341	31.59879	-1.157114	0.2596
R-squared	0.710343	Mean dependent var	483.4766	
Adjusted R-squared	0.591847	S.D. dependent var	118.4206	
S.E. of regression	75.65521	Akaike info criterion	11.74056	
Sum squared resid	125921.6	Schwarz criterion	12.19860	
Log likelihood	-177.8489	F-statistic	5.994654	
Durbin-Watson stat	2.113293	Prob(F-statistic)	0.000296	