UNIVERSITES AND COLLEGES AT UNITED STATES.

Math 240.SF1: Data Analysis

Final Project

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By

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INTRODUCTION

This paper examines the number of colleges and universities in the United States. This data set contains universities' names, the number of degrees in each university, student's tuition fees. I describe how the scholarship amount influences the total tuition fees. Moreover, each university has a different kind of percentage of scholarship amount for each student.

Although the students get a scholarship amount to reduce their fee structure, they have to work for other expenses for their education. To overcome this issue, I created some independent variables of on-campus jobs, working hours, salary in the dollar, etc.

In addition to this, I like to evaluate the total number of students admitted to each college, so I created some other variables called the percentage of students admitted, the total number of seats allocated by the US government, number of vacancy seats available.

OBJECTIVE

With my aforementioned goal in mind, I made my primary objective to determine how the independent variable influences the dependent variable. Using an independent variable, I evaluated the total number of colleges in each state, and how they are providing scholarship amounts for the students and details of the score for lab hours. I provided all the details by using a pie chart, scatter plot, regression analysis, t-test for paired variables, pivot table to identify the details for each university in state wise, and descriptive statistics to identify the seat vacancies in each university.

US GOVERNMENT EDUCATION SYSTEM.

UNIID, INSTNM, CITY, MAIN, NMOFBRANCH, PREDGR, HRDEGR, SCHOLARSHIP AMT IN $,

PERCENTAGE OF STUD ADM, ACCOMMODATION FEES=10%(Tuit.Fe), HEALTH INSURANCE 5%(Tuit.Fee), TERM FEES $, REGION, PERCENTAGE OF STUD ADM-%, OFF CAMPUS JOB-WHRS, ON CAMPUS JOB-WHRS, OFF CAMPUS SALARY IN $,ON CAMPUS SALARY IN $,ON CAMPUS JOB(YES=1,NO=0), WEEKLY WORKING HRS, STD SALARY IN $, UNIVERSITY ACCOMMODATION (YES=1,NO=0)

EXAMINATION FEES(50%(T.F), LIB+COURSE FEE+OTHERS

Using above data, we will calculate and perform the following functions:

1. Describing data visually:
   a. Frequency distribution and Histograms.

Frequency Distributions:

A frequency distribution is a table formed by classifying n data values into k classes called bins. The bin limits define the values to be included in each bin.

Sturges' Rule: $k = 1 + 3.3 \log (n)$

In my data set contains n= 352.

$k = 1 + 3.3 \log (352)$

Here I am taking a sample of Scholarship amount n= 352; x min= 1001 and x max =1999.

Histograms:

A histogram is a graphical representation of a frequency distribution. A histogram is a bar chart whose Y-axis shows the number of data values (or a percentage) within each bin of a frequency distribution and whose X-axis ticks show the end points of each bin.

b. Column and Bar charts.

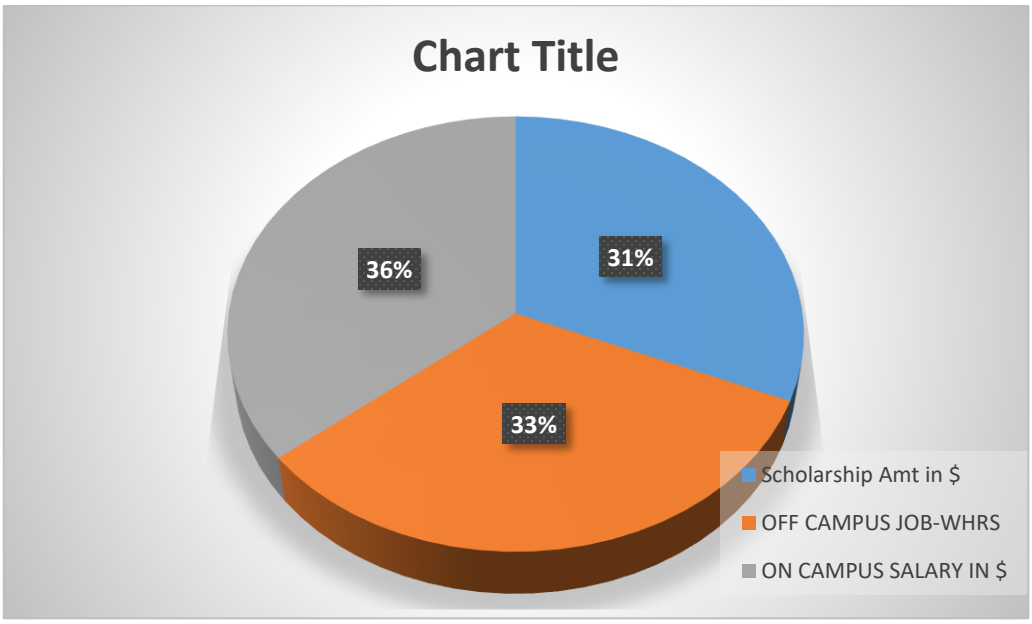
A column chart is a vertical display of data and a bar chart is a horizontal display of data.

Here I am going to compare student's salary of both on campus job and off campus job with the working hours using column and bar chart.

c. Pie charts:

A pie chart can only convey a general idea of the data because it is hard to assess areas precisely. It should have only a few slices (typically two to five) and the slices should be labeled with data values or percents. The only correct use of a pie chart is to portray data that sum to a total (e.g., percent market shares).

Scholarship Amt in $	53298
OFF CAMPUS JOB-WHRS	55675
ON CAMPUS SALARY IN	60860



D. Pivot Tables:

PivotTable One of Excel's most popular and powerful features is the pivot table, which provides interactive analysis of a data matrix. The simplest kind of pivot table has rows and columns. Each of its cells shows a statistic for a row and column combination. The row and column variables must be either categorical or discrete numerical and the variable for the table cells must be numerical.

Row Labels
AK
Alaska Career College
Alaska Pacific University
AVTEC-Alaska's Institute of Technology
NEW CONCEPTS BEAUTY SCHOOL INC
Prince William Sound Community College
Sheldon Jackson College
University of Alaska Anchorage
University of Alaska Fairbanks
University of Alaska Southeast
AL
Alabama A & M University
ALABAMA AVIATION AND TECHNICAL COLLEGE
Alabama Southern Community College
Alabama State University
Amridge University
Athens State University
Auburn University
Auburn University at Montgomery
Bevill State Community College
BEVILL STATE COMMUNITY COLLEGE-WALKER COLLEGE CAMP
Birmingham Southern College
Bishop State Community College
Central Alabama Community College
Chattahoochee Valley Community College
CHAUNCEY SPARKS STATE TECHNICAL COLLEGE
Coastal Alabama Community College
Community College of the Air Force
Concordia College Alabama
Enterprise State Community College
FAULKNER UNIVERSITY
FAULKNER UNIVERSITY-BIRMINGHAM
FAULKNER UNIVERSITY-FLORENCE
Gadsden Business College

GADSDEN BUSINESS COLLEGE-ANNISTON
Gadsden State Community College
GADSDEN STATE COMMUNITY COLLEGE-AYERS CAMPUS
George C Wallace Community College-Dothan
George C Wallace State Community College-Hanceville
George C Wallace State Community College-Selma
H Councill Trenholm State Community College
H COUNCILL TRENHOLM STATE TECHNICAL COLLEGE-PATTER
Heritage Christian University
Herzing University-Birmingham
Huntingdon College
J. F. Drake State Community and Technical College
Jacksonville State University
Jefferson Davis Community College
Jefferson State Community College
John C Calhoun State Community College
Judson College
Lawson State Community College-Bessemer Campus
Lawson State Community College-Birmingham Campus
Lurleen B Wallace Community College
LURLEEN B WALLACE COMMUNITY COLLEGE-MACARTHUR CAMP
Marion Military Institute
Miles College
Northeast Alabama Community College
Northwest-Shoals Community College
Oakwood University
Reid State Technical College
Samford University
Shelton State Community College
Snead State Community College
South University-Montgomery
Southeastern Bible College
Southern Community College
Spring Hill College
Stillman College
Talladega College
The University of Alabama
Troy State University-Dothan Campus
Troy State University-Montgomery
TROY STATE UNIVERSITY-PHENIX CITY

Troy University
Tuskegee University
United States Sports Academy
University of Alabama at Birmingham
University of Alabama in Huntsville
University of Mobile
University of Montevallo
University of North Alabama
University of South Alabama
UNIVERSITY OF SOUTH ALABAMA-BALDWIN
University of West Alabama
AR
ABC Beauty College Inc
Academy of Salon and Spa
Arkansas Baptist College
Arkansas Beauty School-Little Rock
Arkansas College of Barbering and Hair Design
Arkansas Northeastern College
Arkansas State University Mid-South
Arkansas State University-Beebe
Arkansas State University-Main Campus
ARKANSAS STATE UNIVERSITY-SEARCY
Arkansas Tech University
ARKANSAS VALLEY TECHNICAL INSTITUTE
Arthur's Beauty College Inc-Fort Smith
Arthur's Beauty College Inc-Jacksonville
Baptist Health College-Little Rock
Bee Jays Academy
Black River Technical College
Blytheville Academy of Cosmetology
Career Academy of Hair Design
Central Baptist College
College of the Ouachitas
Cossatot Community College of the University of Arkansas
COTTON BOLL TECHNICAL INSTITUTE
Crowley's Ridge College
Crowley's Ridge Technical Institute
De Luxe Beauty School
DELTA TECHNICAL INSTITUTE
East Arkansas Community College
Eastern College of Health Vocations-Little Rock

FOREST ECHOES TECHNICAL INSTITUTE
GREAT RIVERS TECHNICAL INSTITUTE
Harding University
Henderson State University
Hendrix College
Hot Springs Beauty College
Imagine-Paul Mitchell Partner School
Jefferson Regional Medical Center School of Nursing
John Brown University
Lees School of Cosmetology
Lyon College
MARCEL-ROYALE BEAUTY ACADEMY
Marsha Kay Beauty College
National Park College
New Tyler Barber College Inc
North Arkansas College
NORTHWEST ARKANSAS COLLEGE OF COSMETOLOGY
Northwest Technical Institute
Ouachita Baptist University
Ozarka College
Paul Mitchell the School-Arkansas
Philander Smith College
Phillips Community College of the University of Arkansas
PROFESSIONAL BEAUTY COLLEGE INC
Professional Cosmetology Education Center
QUAPAW TECHNICAL INSTITUTE
REMINGTON COLLEGE
Searcy Beauty College
Shorter College
South Arkansas Community College
Southeast Arkansas College
Southern Arkansas University Main Campus
Southern Arkansas University Tech
University of Arkansas
University of Arkansas at Little Rock
University of Arkansas at Monticello
University of Arkansas at Pine Bluff
University of Arkansas Community College Rich Mountain
University of Arkansas Community College-Batesville
University of Arkansas Community College-Hope
University of Arkansas Community College-Morrilton

University of Arkansas for Medical Sciences
University of Arkansas-Fort Smith
University of Arkansas-Pulaski Technical College
University of Central Arkansas
University of the Ozarks
Williams Baptist College
AZ
American Indian College Inc
AMERICAN INSTITUTE
American Institute of Trucking
Anthem College-Phoenix
Arizona Academy of Beauty-East
Arizona Automotive Institute
ARIZONA BIBLE COLLEGE
Arizona Christian University
Arizona State University-Tempe
Arizona Western College
Avalon School of Cosmetology-Mesa
Brillare Hairdressing Academy
Brookline College-Phoenix
Brown Mackie College-Tucson
Bryan University
Carrington College-Mesa
Carrington College-Phoenix North
Carrington College-Tucson
Central Arizona College
Charles of Italy Beauty College
Cochise County Community College District
CollegeAmerica-Flagstaff
Collins College
Cortiva Institute-Scottsdale
Cortiva Institute-Tucson
DeVoe College of Beauty
DeVry University-Arizona
Dine College
Eastern Arizona College
Empire Beauty School-Chandler
Empire Beauty School-Flagstaff
Empire Beauty School-Glendale
Empire Beauty School-NW Phoenix
Empire Beauty School-Paradise Valley

Empire Beauty School-Tucson
GateWay Community College
Glendale Community College
Grand Canyon University
ITT Technical Institute-Tempe
ITT Technical Institute-Tucson
Kaplan College-Phoenix
Lamson College
Long Technical College-East Valley
Maricopa Beauty College LLC
Mesa Community College
Metropolitan College
Mohave Community College
Mundus Institute
Northern Arizona University
Northland Pioneer College
Olympian Academy of Cosmetology
Ottawa University-Phoenix
PARKS COLLEGE
Phoenix College
Pima Community College
Pima Medical Institute-Tucson
Prescott College
Refrigeration School Inc
Rio Salado College
Roberto-Venn School of Luthiery
Scottsdale Community College
South Mountain Community College
Southwest University of Visual Arts-Tucson
Thunderbird School of Global Management
Tucson College
Universal Technical Institute of Arizona Inc
Universal Technical Institute of Arizona Inc-Motorcycle Mechanics Institute Division
University of Arizona
University of Phoenix-Phoenix Campus
Western International University
Yavapai College
CA
Academy of Art University
Academy of Professional Careers
Academy Pacific Travel College

Allan Hancock College
Alliant International University
Alliant International University-San Diego
American Academy of Dramatic Arts-Los Angeles
American Baptist Seminary of the West
American Beauty College
American Career College-Los Angeles
American Conservatory Theater
American Film Institute Conservatory
American InterContinental University
American River College
Antelope Valley College
Art Center College of Design
Associated Technical College
Associated Technical College-Los Angeles
Associated Technical College-San Diego
Avalon School of Cosmetology-Alameda
Azusa Pacific University
Bakersfield College
Barstow Community College
Bellus Academy-National City
Bethany University
Biola University
BJORNS HAIRSTYLING ACADEMY
Brooks College
Brooks Institute
Brownson Technical School
Butte College
Cabrillo College
California Baptist University
California Beauty School
CALIFORNIA BUSINESS INSTITUTE
California Christian College
CALIFORNIA COLLEGE OF PODIATRIC MEDICINE
California College of the Arts
California College San Diego
California Hair Design Academy
California Institute of Integral Studies
California Institute of Technology
California Institute of the Arts
California Lutheran University

CALIFORNIA PARAMEDICAL AND TECHNICAL COLLEGE
California Polytechnic State University-San Luis Obispo
California State Polytechnic University-Pomona
California State University Maritime Academy
California State University-Bakersfield
California State University-Chico
California State University-Dominguez Hills
California State University-East Bay
California State University-Fresno
California State University-Fullerton
California State University-Long Beach
California State University-Los Angeles
California State University-Northridge
California State University-Sacramento
California State University-San Bernardino
California State University-Stanislaus
California Western School of Law
Canada College
Career Academy of Beauty
Casa Loma College-Van Nuys
Cerritos College
Cerro Coso Community College
CET-Colton
CET-El Centro
CET-Gilroy
CET-Salinas
CET-San Diego
CET-San Jose
CET-Watsonville
Chabot College
Chaffey College
Chapman University
Charles R Drew University of Medicine and Science
Church Divinity School of the Pacific
Citrus College
City College of San Francisco
Claremont Graduate University
Claremont McKenna College
Cleveland Chiropractic College of Los Angeles
Clovis Adult Education
Coastline Community College

Coba Academy
Cogswell College
Coleman University
College of Alameda
College of the Canyons
Columbia College
Columbia College Hollywood
Concordia University-Irvine
Everest College-Hayward
ITT Technical Institute-Rancho Cordova
Le Cordon Bleu College of Culinary Arts-San Francisco
Milan Institute-Visalia
National Polytechnic College of Science
Phillips Graduate University
San Diego Christian College
Sofia University
The Academy of Radio and TV Broadcasting
University of California-Berkeley
University of California-Davis
University of California-Hastings College of Law
University of California-Irvine
University of California-Los Angeles
University of California-Riverside
University of California-San Diego
University of California-San Francisco
University of California-Santa Barbara
University of California-Santa Cruz
Western University of Health Sciences
IL
Prince Institute-Southeast
NM
Pima Medical Institute-Albuquerque
TN
Harding University Graduate School of Religion
SOUTHERN INSTITUTE OF COSMETOLOGY
WA
Charter College
Grand Total
Row Labels

Here I used pivot table to identify the universities at particular locations:
Such as Berkeley, San francisco with its ID, and percentage of students admitted.

STUDENTS ADMITTED IN THE STATE OF BERKELEY.

Row Labels	UNIVTID	OPEID6	Percentage of Stud Adm-%
American Baptist Seminary of the West	**108861**	**1120**	
Berkeley	**108861**	**1120**	**83**
CA	108861	1120	
Church Divinity School of the Pacific	**112127**	**1165**	
Berkeley	**112127**	**1165**	**76**
CA	112127	1165	
University of California-Berkeley	**110635**	**1312**	
Berkeley	**110635**	**1312**	**84**
CA	110635	1312	

STUDENTS ADMITTED IN THE STATE OF SANFRANCISCO.

Row Labels	Sum of Percentage of Stud Adm-%
112700	**58**
California College of the Arts	
San Francisco	
CA	
131900	**91**
University of California-San Francisco	
San Francisco	
CA	
394700	**71**
University of California-Hastings College of Law	
San Francisco	

CA	
450201	**76**
City College of San Francisco	**76**
San Francisco	
CA	
753100	**68**
Academy of Art University	**68**
San Francisco	
CA	
1188100	**70**
Alliant International University	**70**
San Francisco	
CA	
1215400	
California Institute of Integral Studies	**64**
San Francisco	
CA	
2099200	
American Conservatory Theater	**52**
San Francisco	
CA	
2220200	
Le Cordon Bleu College of Culinary Arts-San Francisco	**95**
San Francisco	
CA	

2. Descriptive Statistics:

a. STANDARDIZED DATA:

The standard deviation is an important measure of variability because of its many roles in statistics.

DESCRIPTIVE STATISTICS FOR STUDENTS ADMITTED AT EACH UNIVERSITY AND THE AVAILABLE VACANCY SEATS AT UNITED STATES UNIVERSITIES:

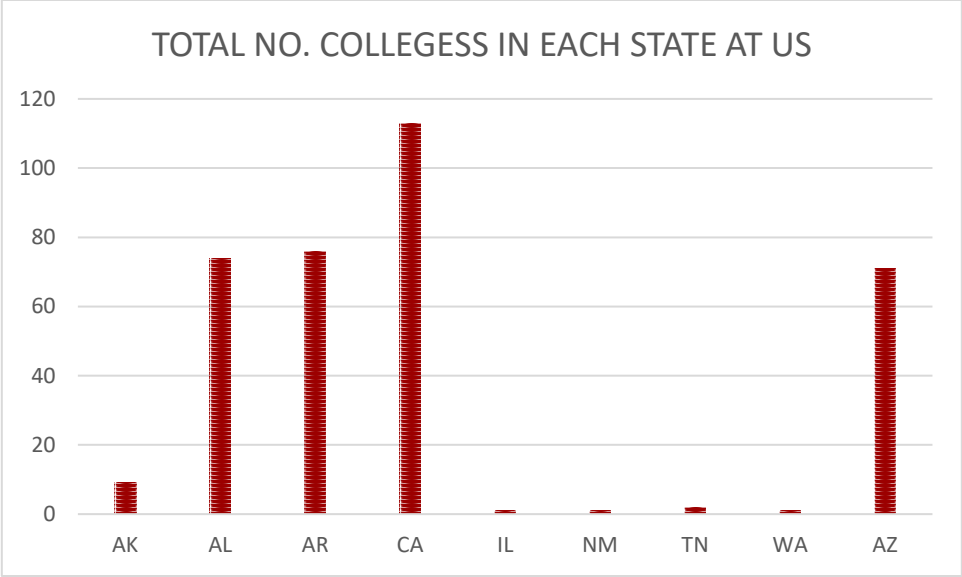
NUM STD ADMITTED PER UNIV		*VACANCY SEATS AVA PER UNIV*	
Mean	1868.556818	Mean	619.6051136

Standard Error	22.06218051	Standard Error	19.57398893
Median	1839	Median	601.5
Mode	1228	Mode	0
Standard Deviation	413.9231966	Standard Deviation	367.2405847
Sample Variance	171332.4127	Sample Variance	134865.647
Kurtosis	-0.511659978	Kurtosis	-0.912368756
Skewness	0.257799001	Skewness	0.22581972
Range	1962	Range	1470
Minimum	1000	Minimum	0
Maximum	2962	Maximum	1470
Sum	657732	Sum	218101
Count	352	Count	352
Confidence Level(95.0%)	43.39069558	Confidence Level(95.0%)	38.49705584

DOT PLOT FOR NUMBER OF COLLEGES IN EACH STATE:

Hear I used pivot plot to identify the number of colleges in each state at US. The dot plot tell us the variability between the data set.

NAME OF THE UNIVERISTIES IN	TOTAL NO. COLL
AK	9
AL	74
AR	76
CA	113
IL	1
NM	1
TN	2
WA	1
AZ	71
TOTAL	348



VARIANCE AND STANDARD DEVIATION:

Here I used 25 sample data and 352 population to measure variance and standard deviation for students participation lab hours out of 10 points in each colleges.

VAR(P=352)	0.727207
VAR(S=25)	0.689067
STD(P=352)	0.876723
STD(S=25)	0.8301

Stephen' Standard Deviation is:

Sum	523298
mean	1486.642

Sum	30634184.9	808590994	n-1	352-1	351	
					295.427	
			sqrt	87276.88005		

S= 295.427

Mean = 1486.642

Coefficient of Variation:

To compare dispersion in data sets with dissimilar units of measurement (e.g., kilograms and ounces) or dissimilar means (e.g., home prices in two different cities), we define the coefficient of variation (CV), which is a unit-free measure of dispersion.

The CV is the standard deviation expressed as a percent of the mean. In some data sets, the standard deviation can actually exceed the mean, so the CV can exceed 100 percent.

CV = 100*s/mean of x

CV=100* 295.427/1486.642= 19.88%

Standardized Data:

A general approach to identifying unusual observations is to redefine each observation in terms of its distance from the mean in standard deviations to obtain standardized data. We get the standardized value (called a z-score) by transforming each value of the observed data:

zi = xi - μ / σ for a population.
zi = xi – mean of x/s for a sample.

Here I used students scholarship amount to determine z-score value.

Scholarship Amt in $			x-mean	square(x-mean)	square of x	standardize data-z score
1001			-485.642	235848.1522	1002001	-1.643866985
1007	sum	523298	-479.642	230056.4482	1014049	-1.623557372
1012	mean	1486.642	-474.642	225285.0282	1024144	-1.606632695
1013	std dev	295.4266	-473.642	224336.7442	1026169	-1.603247759
1014	std dev-s	295.4266	-472.642	223390.4602	1028196	-1.599862824

1014	-472.642	223390.4602	1028196	-1.599862824
1016	-470.642	221503.8922	1032256	-1.593092953
1020	-466.642	217754.7562	1040400	-1.579553211
1022	-464.642	215892.1882	1044484	-1.57278334
1026	-460.642	212191.0522	1052676	-1.559243598
1027	-459.642	211270.7682	1054729	-1.555858663
1028	-458.642	210352.4842	1056784	-1.552473727
1028	-458.642	210352.4842	1056784	-1.552473727
1029	-457.642	209436.2002	1058841	-1.549088792
1029	-457.642	209436.2002	1058841	-1.549088792
1030	-456.642	208521.9162	1060900	-1.545703856
1031	-455.642	207609.6322	1062961	-1.542318921
1032	-454.642	206699.3482	1065024	-1.538933985
1033	-453.642	205791.0642	1067089	-1.53554905
1038	-448.642	201279.6442	1077444	-1.518624372
1039	-447.642	200383.3602	1079521	-1.515239437
1040	-446.642	199489.0762	1081600	-1.511854501
1042	-444.642	197706.5082	1085764	-1.505084631
1047	-439.642	193285.0882	1096209	-1.488159953
1052	-434.642	188913.6682	1106704	-1.471235276
1054	-432.642	187179.1002	1110916	-1.464465405
1055	-431.642	186314.8162	1113025	-1.461080469
1059	-427.642	182877.6802	1121481	-1.447540728
1061	-425.642	181171.1122	1125721	-1.440770857

1064	-422.642	178626.2602	1132096	-1.43061605
1070	-416.642	173590.5562	1144900	-1.410306437
1070	-416.642	173590.5562	1144900	-1.410306437
1071	-415.642	172758.2722	1147041	-1.406921502
1071	-415.642	172758.2722	1147041	-1.406921502
1072	-414.642	171927.9882	1149184	-1.403536566
1075	-411.642	169449.1362	1155625	-1.39338176
1082	-404.642	163735.1482	1170724	-1.369687212
1083	-403.642	162926.8642	1172889	-1.366302276
1084	-402.642	162120.5802	1175056	-1.362917341
1088	-398.642	158915.4442	1183744	-1.349377599
1090	-396.642	157324.8762	1188100	-1.342607728
1093	-393.642	154954.0242	1194649	-1.332452922
1100	-386.642	149492.0362	1210000	-1.308758373
1101	-385.642	148719.7522	1212201	-1.305373438
1103	-383.642	147181.1842	1216609	-1.298603567
1103	-383.642	147181.1842	1216609	-1.298603567
1104	-382.642	146414.9002	1218816	-1.295218631
1104	-382.642	146414.9002	1218816	-1.295218631
1106	-380.642	144888.3322	1223236	-1.288448761
1107	-379.642	144128.0482	1225449	-1.285063825
1108	-378.642	143369.7642	1227664	-1.28167889
1108	-378.642	143369.7642	1227664	-1.28167889
1111	-375.642	141106.9122	1234321	-1.271524083

1115	-371.642	138117.7762	1243225	-1.257984341
1117	-369.642	136635.2082	1247689	-1.25121447
1121	-365.642	133694.0722	1256641	-1.237674728
1124	-362.642	131509.2202	1263376	-1.227519922
1132	-354.642	125770.9482	1281424	-1.200440438
1133	-353.642	125062.6642	1283689	-1.197055503
1135	-351.642	123652.0962	1288225	-1.190285632
1137	-349.642	122249.5282	1292769	-1.183515761
1149	-337.642	114002.1202	1320201	-1.142896535
1150	-336.642	113327.8362	1322500	-1.1395116
1154	-332.642	110650.7002	1331716	-1.125971858
1158	-328.642	108005.5642	1340964	-1.112432116
1169	-317.642	100896.4402	1366561	-1.075197826
1172	-314.642	98999.58816	1373584	-1.06504302
1173	-313.642	98371.30416	1375929	-1.061658084
1174	-312.642	97745.02016	1378276	-1.058273149
1176	-310.642	96498.45216	1382976	-1.051503278
1177	-309.642	95878.16816	1385329	-1.048118342
1179	-307.642	94643.60016	1390041	-1.041348471
1183	-303.642	92198.46416	1399489	-1.027808729
1183	-303.642	92198.46416	1399489	-1.027808729
1183	-303.642	92198.46416	1399489	-1.027808729
1185	-301.642	90987.89616	1404225	-1.021038858
1189	-297.642	88590.76016	1413721	-1.007499117

1190	-296.642	87996.47616	1416100	-1.004114181
1191	-295.642	87404.19216	1418481	-1.000729246
1193	-293.642	86225.62416	1423249	-0.993959375
1195	-291.642	85055.05616	1428025	-0.987189504
1200	-286.642	82163.63616	1440000	-0.970264826
1200	-286.642	82163.63616	1440000	-0.970264826
1204	-282.642	79886.50016	1449616	-0.956725085
1207	-279.642	78199.64816	1456849	-0.946570278
1218	-268.642	72168.52416	1483524	-0.909335988
1218	-268.642	72168.52416	1483524	-0.909335988
1222	-264.642	70035.38816	1493284	-0.895796246
1232	-254.642	64842.54816	1517824	-0.861946891
1237	-249.642	62321.12816	1530169	-0.845022214
1237	-249.642	62321.12816	1530169	-0.845022214
1239	-247.642	61326.56016	1535121	-0.838252343
1239	-247.642	61326.56016	1535121	-0.838252343
1241	-245.642	60339.99216	1540081	-0.831482472
1243	-243.642	59361.42416	1545049	-0.824712601
1246	-240.642	57908.57216	1552516	-0.814557795
1248	-238.642	56950.00416	1557504	-0.807787924
1250	-236.642	55999.43616	1562500	-0.801018053
1253	-233.642	54588.58416	1570009	-0.790863247
1255	-231.642	53658.01616	1575025	-0.784093376
1257	-229.642	52735.44816	1580049	-0.777323505

1260	-226.642	51366.59616	1587600	-0.767168698
1262	-224.642	50464.02816	1592644	-0.760398827
1263	-223.642	50015.74416	1595169	-0.757013892
1269	-217.642	47368.04016	1610361	-0.736704279
1273	-213.642	45642.90416	1620529	-0.723164537
1274	-212.642	45216.62016	1623076	-0.719779602
1278	-208.642	43531.48416	1633284	-0.70623986
1291	-195.642	38275.79216	1666681	-0.662235699
1293	-193.642	37497.22416	1671849	-0.655465828
1294	-192.642	37110.94016	1674436	-0.652080892
1296	-190.642	36344.37216	1679616	-0.645311021
1300	-186.642	34835.23616	1690000	-0.63177128
1303	-183.642	33724.38416	1697809	-0.621616473
1308	-178.642	31912.96416	1710864	-0.604691796
1318	-168.642	28440.12416	1737124	-0.570842441
1318	-168.642	28440.12416	1737124	-0.570842441
1320	-166.642	27769.55616	1742400	-0.56407257
1323	-163.642	26778.70416	1750329	-0.553917764
1328	-158.642	25167.28416	1763584	-0.536993086
1329	-157.642	24851.00016	1766241	-0.533608151
1329	-157.642	24851.00016	1766241	-0.533608151
1330	-156.642	24536.71616	1768900	-0.530223216
1335	-151.642	22995.29616	1782225	-0.513298538
1337	-149.642	22392.72816	1787569	-0.506528667

1345	-141.642	20062.45616	1809025	-0.479449184
1346	-140.642	19780.17216	1811716	-0.476064248
1346	-140.642	19780.17216	1811716	-0.476064248
1346	-140.642	19780.17216	1811716	-0.476064248
1349	-137.642	18945.32016	1819801	-0.465909442
1358	-128.642	16548.76416	1844164	-0.435445022
1363	-123.642	15287.34416	1857769	-0.418520345
1365	-121.642	14796.77616	1863225	-0.411750474
1369	-117.642	13839.64016	1874161	-0.398210732
1372	-114.642	13142.78816	1882384	-0.388055926
1372	-114.642	13142.78816	1882384	-0.388055926
1373	-113.642	12914.50416	1885129	-0.38467099
1375	-111.642	12463.93616	1890625	-0.377901119
1378	-108.642	11803.08416	1898884	-0.367746313
1384	-102.642	10535.38016	1915456	-0.3474367
1392	-94.642	8957.108164	1937664	-0.320357216
1393	-93.642	8768.824164	1940449	-0.316972281
1395	-91.642	8398.256164	1946025	-0.31020241
1399	-87.642	7681.120164	1957201	-0.296662668
1402	-84.642	7164.268164	1965604	-0.286507862
1403	-83.642	6995.984164	1968409	-0.283122926
1407	-79.642	6342.848164	1979649	-0.269583184
1408	-78.642	6184.564164	1982464	-0.266198249
1409	-77.642	6028.280164	1985281	-0.262813314
1409	-77.642	6028.280164	1985281	-0.262813314
1412	-74.642	5571.428164	1993744	-0.252658507
1416	-70.642	4990.292164	2005056	-0.239118765
1423	-63.642	4050.304164	2024929	-0.215424217
1423	-63.642	4050.304164	2024929	-0.215424217
1425	-61.642	3799.736164	2030625	-0.208654346
1426	-60.642	3677.452164	2033476	-0.205269411

1427	-59.642	3557.168164	2036329	-0.201884475
1430	-56.642	3208.316164	2044900	-0.191729669
1431	-55.642	3096.032164	2047761	-0.188344733
1435	-51.642	2666.896164	2059225	-0.174804991
1436	-50.642	2564.612164	2062096	-0.171420056
1444	-42.642	1818.340164	2085136	-0.144340572
1448	-38.642	1493.204164	2096704	-0.13080083
1452	-34.642	1200.068164	2108304	-0.117261088
1452	-34.642	1200.068164	2108304	-0.117261088
1459	-27.642	764.080164	2128681	-0.09356654
1461	-25.642	657.512164	2134521	-0.086796669
1462	-24.642	607.228164	2137444	-0.083411734
1462	-24.642	607.228164	2137444	-0.083411734
1466	-20.642	426.092164	2149156	-0.069871992
1469	-17.642	311.240164	2157961	-0.059717185
1469	-17.642	311.240164	2157961	-0.059717185
1469	-17.642	311.240164	2157961	-0.059717185
1470	-16.642	276.956164	2160900	-0.05633225
1471	-15.642	244.672164	2163841	-0.052947314
1473	-13.642	186.104164	2169729	-0.046177444
1473	-13.642	186.104164	2169729	-0.046177444
1477	-9.642	92.968164	2181529	-0.032637702
1479	-7.642	58.400164	2187441	-0.025867831
1482	-4.642	21.548164	2196324	-0.015713024
1486	-0.642	0.412164	2208196	-0.002173282
1487	0.358	0.128164	2211169	0.001211653
1491	4.358	18.992164	2223081	0.014751395
1493	6.358	40.424164	2229049	0.021521266
1496	9.358	87.572164	2238016	0.031676072
1498	11.358	129.004164	2244004	0.038445943
1506	19.358	374.732164	2268036	0.065525427
1508	21.358	456.164164	2274064	0.072295298
1509	22.358	499.880164	2277081	0.075680233
1510	23.358	545.596164	2280100	0.079065169
1513	26.358	694.744164	2289169	0.089219975
1515	28.358	804.176164	2295225	0.095989846
1521	34.358	1180.472164	2313441	0.116299459
1522	35.358	1250.188164	2316484	0.119684394
1524	37.358	1395.620164	2322576	0.126454265
1528	41.358	1710.484164	2334784	0.139994007
1529	42.358	1794.200164	2337841	0.143378943
1535	48.358	2338.496164	2356225	0.163688556
1541	54.358	2954.792164	2374681	0.183998168

1552	65.358	4271.668164	2408704	0.221232458
1553	66.358	4403.384164	2411809	0.224617394
1555	68.358	4672.816164	2418025	0.231387265
1560	73.358	5381.396164	2433600	0.248311942
1561	74.358	5529.112164	2436721	0.251696878
1567	80.358	6457.408164	2455489	0.272006491
1570	83.358	6948.556164	2464900	0.282161297
1570	83.358	6948.556164	2464900	0.282161297
1572	85.358	7285.988164	2471184	0.288931168
1575	88.358	7807.136164	2480625	0.299085974
1576	89.358	7984.852164	2483776	0.30247091
1580	93.358	8715.716164	2496400	0.316010652
1582	95.358	9093.148164	2502724	0.322780523
1583	96.358	9284.864164	2505889	0.326165458
1587	100.358	10071.72816	2518569	0.3397052
1589	102.358	10477.16016	2524921	0.346475071
1596	109.358	11959.17216	2547216	0.370169619
1596	109.358	11959.17216	2547216	0.370169619
1605	118.358	14008.61616	2576025	0.400634038
1609	122.358	14971.48016	2588881	0.41417378
1620	133.358	17784.35616	2624400	0.45140807
1623	136.358	18593.50416	2634129	0.461562877
1624	137.358	18867.22016	2637376	0.464947812
1625	138.358	19142.93616	2640625	0.468332748
1626	139.358	19420.65216	2643876	0.471717683
1628	141.358	19982.08416	2650384	0.478487554
1636	149.358	22307.81216	2676496	0.505567038
1637	150.358	22607.52816	2679769	0.508951973
1638	151.358	22909.24416	2683044	0.512336909
1642	155.358	24136.10816	2696164	0.525876651
1645	158.358	25077.25616	2706025	0.536031457
1652	165.358	27343.26816	2729104	0.559726005
1655	168.358	28344.41616	2739025	0.569880812
1675	188.358	35478.73616	2805625	0.637579521
1676	189.358	35856.45216	2808976	0.640964457
1678	191.358	36617.88416	2815684	0.647734328
1679	192.358	37001.60016	2819041	0.651119263
1680	193.358	37387.31616	2822400	0.654504198
1684	197.358	38950.18016	2835856	0.66804394
1686	199.358	39743.61216	2842596	0.674813811
1688	201.358	40545.04416	2849344	0.681583682
1689	202.358	40948.76016	2852721	0.684968618
1693	206.358	42583.62416	2866249	0.69850836

1708	221.358	48999.36416	2917264	0.749282392
1710	223.358	49888.79616	2924100	0.756052263
1711	224.358	50336.51216	2927521	0.759437198
1712	225.358	50786.22816	2930944	0.762822133
1714	227.358	51691.66016	2937796	0.769592004
1715	228.358	52147.37616	2941225	0.77297694
1720	233.358	54455.95616	2958400	0.789901617
1722	235.358	55393.38816	2965284	0.796671488
1723	236.358	55865.10416	2968729	0.800056424
1725	238.358	56814.53616	2975625	0.806826295
1727	240.358	57771.96816	2982529	0.813596166
1738	251.358	63180.84416	3020644	0.850830456
1739	252.358	63684.56016	3024121	0.854215391
1741	254.358	64697.99216	3031081	0.860985262
1741	254.358	64697.99216	3031081	0.860985262
1742	255.358	65207.70816	3034564	0.864370198
1742	255.358	65207.70816	3034564	0.864370198
1742	255.358	65207.70816	3034564	0.864370198
1746	259.358	67266.57216	3048516	0.877909939
1757	270.358	73093.44816	3087049	0.91514423
1763	276.358	76373.74416	3108169	0.935453842
1765	278.358	77483.17616	3115225	0.942223713
1770	283.358	80291.75616	3132900	0.959148391
1770	283.358	80291.75616	3132900	0.959148391
1776	289.358	83728.05216	3154176	0.979458003
1779	292.358	85473.20016	3164841	0.98961281
1780	293.358	86058.91616	3168400	0.992997745
1780	293.358	86058.91616	3168400	0.992997745
1782	295.358	87236.34816	3175524	0.999767616
1785	298.358	89017.49616	3186225	1.009922423
1786	299.358	89615.21216	3189796	1.013307358
1787	300.358	90214.92816	3193369	1.016692294
1791	304.358	92633.79216	3207681	1.030232036
1791	304.358	92633.79216	3207681	1.030232036
1793	306.358	93855.22416	3214849	1.037001906
1793	306.358	93855.22416	3214849	1.037001906
1794	307.358	94468.94016	3218436	1.040386842
1795	308.358	95084.65616	3222025	1.043771777
1798	311.358	96943.80416	3232804	1.053926584
1800	313.358	98193.23616	3240000	1.060696455
1806	319.358	101989.5322	3261636	1.081006068
1808	321.358	103270.9642	3268864	1.087775938
1808	321.358	103270.9642	3268864	1.087775938

1809	322.358	103914.6802	3272481	1.091160874
1810	323.358	104560.3962	3276100	1.094545809
1814	327.358	107163.2602	3290596	1.108085551
1815	328.358	107818.9762	3294225	1.111470487
1815	328.358	107818.9762	3294225	1.111470487
1821	334.358	111795.2722	3316041	1.1317801
1826	339.358	115163.8522	3334276	1.148704777
1828	341.358	116525.2842	3341584	1.155474648
1829	342.358	117209.0002	3345241	1.158859583
1831	344.358	118582.4322	3352561	1.165629454
1832	345.358	119272.1482	3356224	1.16901439
1836	349.358	122051.0122	3370896	1.182554132
1836	349.358	122051.0122	3370896	1.182554132
1845	358.358	128420.4562	3404025	1.213018551
1847	360.358	129857.8882	3411409	1.219788422
1848	361.358	130579.6042	3415104	1.223173357
1851	364.358	132756.7522	3426201	1.233328164
1853	366.358	134218.1842	3433609	1.240098035
1855	368.358	135687.6162	3441025	1.246867906
1857	370.358	137165.0482	3448449	1.253637776
1858	371.358	137906.7642	3452164	1.257022712
1860	373.358	139396.1962	3459600	1.263792583
1861	374.358	140143.9122	3463321	1.267177518
1862	375.358	140893.6282	3467044	1.270562454
1864	377.358	142399.0602	3474496	1.277332325
1866	379.358	143912.4922	3481956	1.284102196
1867	380.358	144672.2082	3485689	1.287487131
1877	390.358	152379.3682	3523129	1.321336486
1877	390.358	152379.3682	3523129	1.321336486
1878	391.358	153161.0842	3526884	1.324721421
1880	393.358	154730.5162	3534400	1.331491292
1882	395.358	156307.9482	3541924	1.338261163
1883	396.358	157099.6642	3545689	1.341646099
1885	398.358	158689.0962	3553225	1.34841597
1888	401.358	161088.2442	3564544	1.358570776
1890	403.358	162697.6762	3572100	1.365340647
1891	404.358	163505.3922	3575881	1.368725582
1894	407.358	165940.5402	3587236	1.378880389
1903	416.358	173353.9842	3621409	1.409344808
1904	417.358	174187.7002	3625216	1.412729743
1905	418.358	175023.4162	3629025	1.416114679
1905	418.358	175023.4162	3629025	1.416114679
1911	424.358	180079.7122	3651921	1.436424292

1912	425.358	180929.4282	3655744	1.439809227
1916	429.358	184348.2922	3671056	1.453348969
1919	432.358	186933.4402	3682561	1.463503775
1920	433.358	187799.1562	3686400	1.466888711
1924	437.358	191282.0202	3701776	1.480428453
1930	443.358	196566.3162	3724900	1.500738066
1931	444.358	197454.0322	3728761	1.504123001
1936	449.358	201922.6122	3748096	1.521047678
1938	451.358	203724.0442	3755844	1.527817549
1939	452.358	204627.7602	3759721	1.531202485
1947	460.358	211929.4882	3790809	1.558281969
1951	464.358	215628.3522	3806401	1.57182171
1952	465.358	216558.0682	3810304	1.575206646
1964	477.358	227870.6602	3857296	1.615825872
1964	477.358	227870.6602	3857296	1.615825872
1967	480.358	230743.8082	3869089	1.625980678
1977	490.358	240450.9682	3908529	1.659830033
1980	493.358	243402.1162	3920400	1.669984839
1981	494.358	244389.8322	3924361	1.673369775
1982	495.358	245379.5482	3928324	1.67675471
1982	495.358	245379.5482	3928324	1.67675471
1985	498.358	248360.6962	3940225	1.686909516
1988	501.358	251359.8442	3952144	1.697064323
1999	512.358	262510.7202	3996001	1.734298613

Unusual Observations:

Based on its standardized z-score, a data value is classified as:

Unusual if

MOD z i > 2 (beyond μ + or - 2σ) Outlier if u

MOD z i > 3 (beyond μ + or - 3σ)

From this z-score value there is no any outlier.

b. Percentiles, Quartile, and box plots:

Percentile score will tell us where we stand in comparison with others.

For example, if you are in the 83rd percentile, then 83 percent of the test-takers scored below you, and you are in the

Term Fees:		
Mean(Average)	6494.634	
Meadian	6512	
Mode	6048	
Q1	6267	
Q2	6512	
Q3	6728.5	
Max	6999	
Min	6000	
N	352	
Midhinge	Q1+Q2/2	9523

6512<9523 Skewed Left

Second Quartile is Median.

The first and third quartiles Q1 and Q3 indicate center because they define the boundaries for the middle 50 percent of the data. But Q1 and Q3 also indicate variability because the interquartile range Q3 – Q1 (denoted IQR) measures the degree of spread in the data (the middle 50 percent).

A box plot shows center (position of the median Q2). A box plot shows variability (width of the "box" defined by Q1 and Q3 and the range between xmin and xmax). A box plot shows shape (skewness if the whiskers are of unequal length and/or if the median is not in the center of the box).

c. Correlation and covariance.

The sample correlation coefficient is a well-known statistic that describes the degree of linearity between paired observations on two quantitative variables X and Y. The data set consists of n pairs (xi, yi) that are usually displayed on a scatter plot.

Its range is -1 <= r <= +1. When r is near 0 there is little or no linear relationship between X and Y. An r value near +1 indicates a strong positive relationship, while an r value near -1 indicates a strong negative relationship.

Excel's formula =CORREL(X Data, Y Data) will return the sample correlation coefficient for two columns (or rows) of paired data.

To estimate the covariance, we would generally use the sample formula:

Covariance The covariance of two random variables X and Y is denoted Cov(X,Y) or simply σXY. The covariance measures the degree to which the values of X and Y change together.

Correlation:

	Total Seats Available Per University
Column 1	1

Covariance:

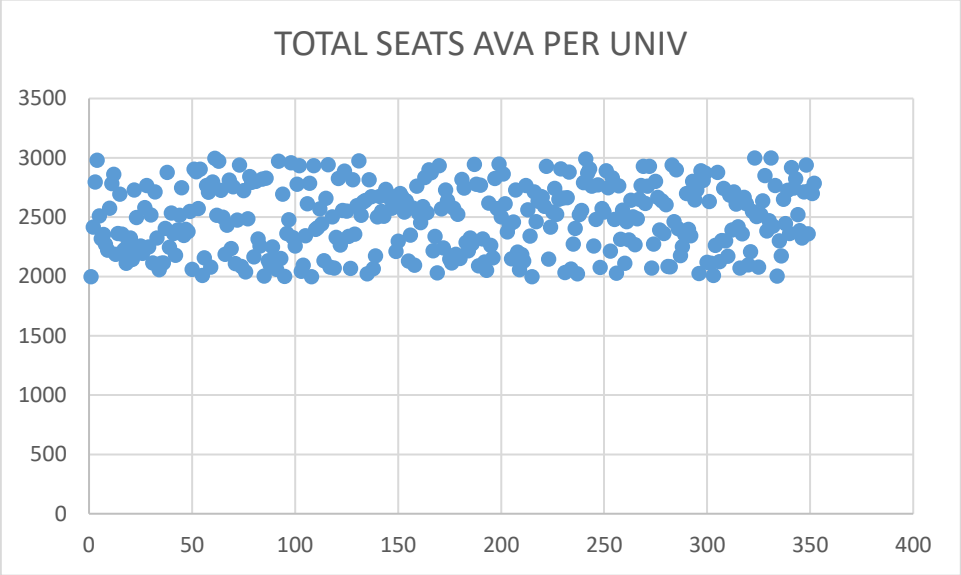
	Total Seats Available Per University
	79353.11

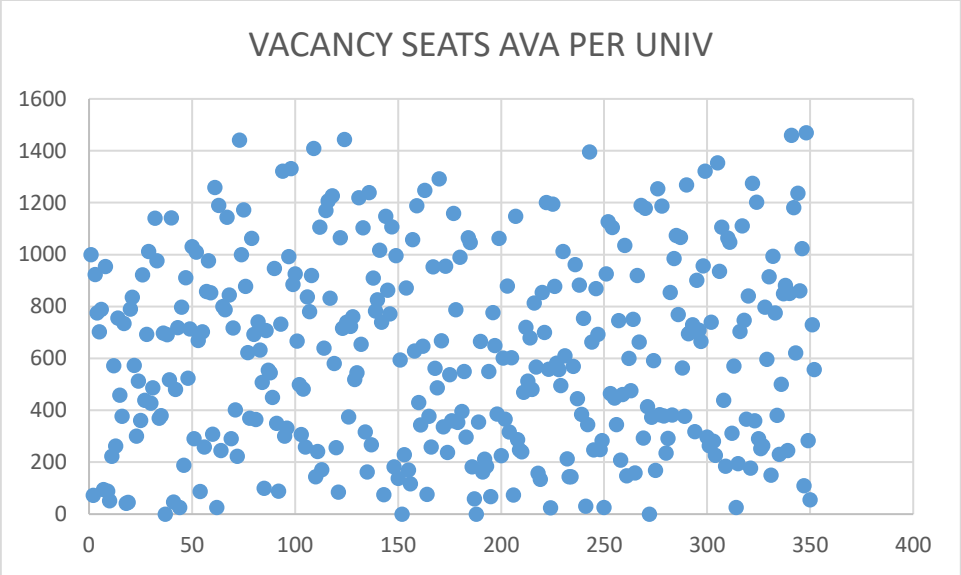
Covariance with 2 variables (vacancy seats available per university, Total seats available per university)

	VACANCY SEATS AVA PER UNIV	TOTAL SEATS AVA PER UNIV
Column 1	134482.5	
Column 2	21494.97	79353.11

Coefficient:

	VACANCY SEATS AVA PER UNIV	TOTAL SEATS AVA PER UNIV
VACANCY SEATS AVA PER UNIV	1	
TOTAL SEATS AVA PER UNIV	0.208076	1





Applying the formula for a sample correlation coefficient:

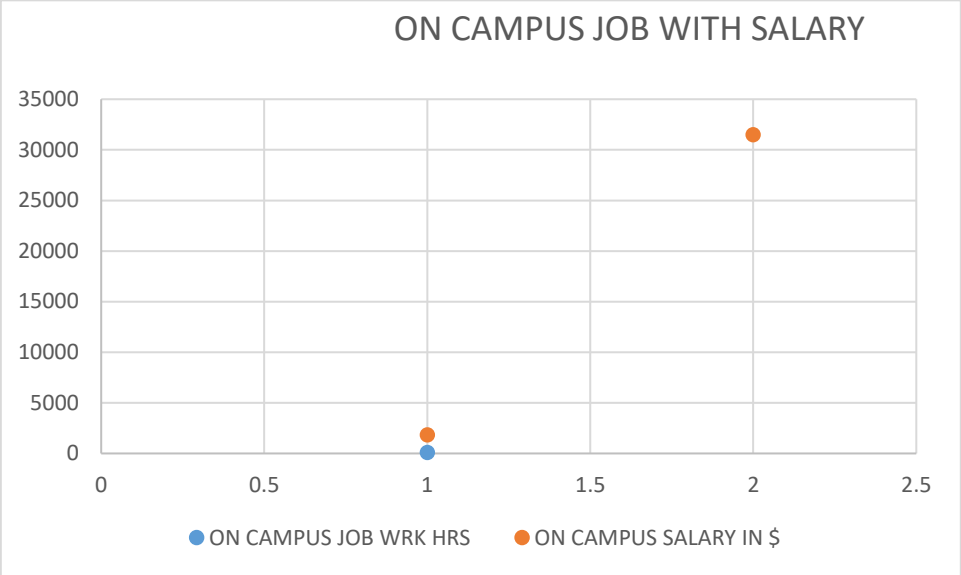
CORRELATION	0.208075996	BT. 2 VARIABLES(Xdata,ydata)
COVARIANCE	-113309.4376	BT. 2 VARIABLES(Xdata,ydata)
STDIV(X DATA)	367.2405847	
STD(Y DATA)	282.0978279	
COUNT(X DATA)	352	

r = sXY / s XsY ; r = -87039.3

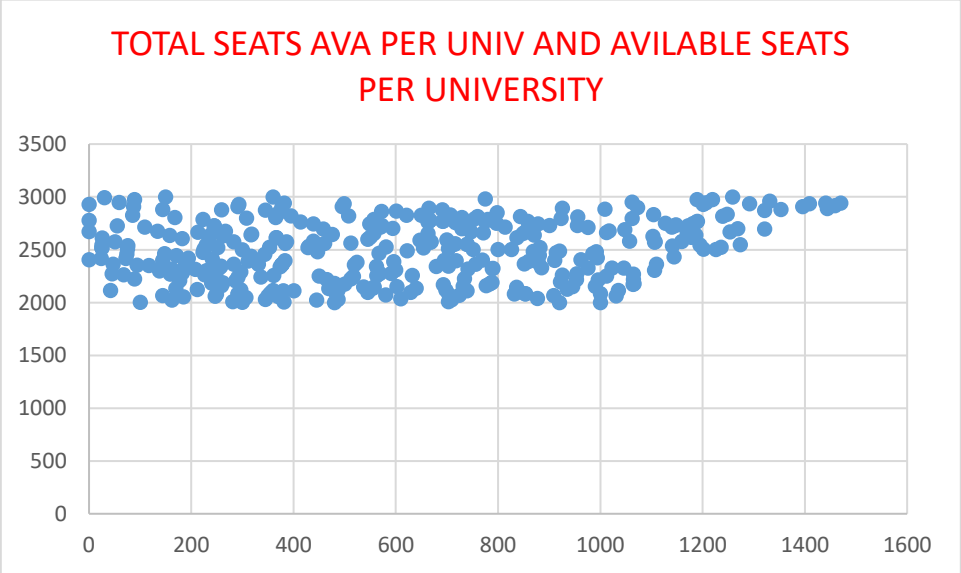
COVARIANCE BETWENN 2 VARIABLES OF ON CAMPUS JOB WRKING HOURS WITH ON CAMPUS SALARY IN $;

Here I want to correlate when working hours increase that time the salary also will increase.

	ON CAMPUS JOB WRK HRS	ON CAMPUS SALARY IN $
ON CAMPUS JOB WRK HRS	108.9666318	
ON CAMPUS SALARY IN $	1852.43274	31491.35658



THE DEGREE OF LINEARINTY BETWEEN PAIRED OBSERVATIONS:



d. Skewness and kurtosis:

Skewness In a general way, skewness may be judged by looking at the sample histogram, or by comparing the mean and median.

Kurtosis Kurtosis refers to the relative length of the tails and the degree of concentration in the center.

TOP 10 PERCNTAGE IN CA SATAE UNIVERSITIES :

PERCENTAGE OF SUTENTS ADMITTED, UNIVERSITY NAME, NUMBER OF STUDENTS ADMITTED, AND TUITION FEES.

Row Labels	Count of STABBR
CA	
59	**4**
Brownson Technical School	
1228	
6153	
California Hair Design Academy	
1228	
6772	
College of Alameda	
1622	
6694	
San Diego Christian College	
1755	
6404	
68	**4**
Academy of Art University	
1778	
6316	
American InterContinental University	
1474	
6218	
Cogswell College	
1701	
6176	
Western University of Health Sciences	
1804	
6945	
72	**6**
Alliant International University-San Diego	

1625

6240

Antelope Valley College

2007

6317

Azusa Pacific University

1492

6352

CET-Gilroy

1836

6126

Clovis Adult Education

1809

6004

Sofia University

1547

6588

74 **4**

California State University-Los Angeles

1551

6264

Chapman University

1902

6491

Milan Institute-Visalia

1863

6404

University of California-Santa Barbara

2048

6608

75 **5**

American Beauty College

1610

6501

Brooks College

1689

6792

California State University-Northridge

1990

6733

Canada College

2122

6257

Concordia University-Irvine
1789
6898
83 **5**
American Baptist Seminary of the West
2091
6066
CET-Watsonville
1735
6531
Columbia College
1711
6269
Phillips Graduate University
2102
6472
University of California-Davis
1684
6714
85 **4**
American River College
2347
6742
CALIFORNIA BUSINESS INSTITUTE
1905
6491
Career Academy of Beauty
1739
6296
College of the Canyons
2188
6563
86 **4**
CET-Colton
2247
6867
CET-San Jose
2032
6282
Cleveland Chiropractic College of Los Angeles
2424
6520
ITT Technical Institute-Rancho Cordova

1823

6819

88 **5**

Bellus Academy-National City

2078

6989

California Baptist University

1828

6686

CALIFORNIA PARAMEDICAL AND TECHNICAL COLLEGE

1925

6018

Cerro Coso Community College

2528

6682

Coba Academy

2325

6409

91 **4**

Cabrillo College

2252

6192

California State University-Sacramento

2372

6769

California Western School of Law

2617

6485

University of California-San Francisco

2404

6492

TOTAL 45 COLLEGES

3. Probability:

   a. Random Experiments:

      A random experiment is an observational process whose results cannot be known in advance. For example, when a customer enters a Lexus dealership, will the customer buy a car or not? How much will the customer spend?

The set of all possible outcomes (denoted S) is the sample space for the experiment. Some sample spaces can be enumerated easily, while others may be immense or impossible to enumerate.

For example, when C itiBank makes a consumer loan, we might define a sample space with only two outcomes: S 5 {default, no default} The sample space describing a Walmart customer's payment method might have four outcomes: S 5 {cash, debit card, credit card, check}

b. Probability.

The probability of an event is a number that measures the relative likelihood that the event will occur. The probability of an event A, denoted P(A), must lie within the interval from 0 to 1:

0 <= P(A) <= 1

P(A) 5 0 means the event cannot occur (e.g., a naturalized citizen becoming president of the United States) while P(A) 5 1 means the event is certain to occur (e.g., rain occurring in Hilo, Hawaii, sometime this year).

4. Discrete Probability Distribution:
   a. Uniform Distribution:

A probability distribution can be described either by its probability density function (PDF) or by its cumulative distribution function (CDF).

The uniform continuous distribution is perhaps the simplest model one can imagine. If X is a random variable that is uniformly distributed between a and b.

Since the PDF is rectangular, you can easily verify that the area under the curve is 1 by multiplying its base (b 2 a) by its height 1y(b 2 a)

The uniform distribution can be useful in business for what if analysis, in situations where you know the "worst" and "best" range.

5. Two Sample Hypothesis Test:

The logic of two-sample tests is based on the fact that two samples drawn from the same population may yield different estimates of a parameter due to chance. For example, exhaust emission tests could yield different results for two vehicles of the same type.

   a. Comparing Two Means – independent samples.

Paired Data When sample data consist of n matched pairs, a different approach is required. If the same individuals are observed twice but under different circumstances, we have a paired comparison. For example:
Here I used two pair of samples of the students at same university but different circumstances like day scholar students after getting accommodation at the university campus for the same students.

t-Test: Paired Two Sample for Means

	TUITION FEES in $(ALL STD)	*TERM FEES(HOSTEL STD)*
Mean	6494.633523	6840.178977
Variance	79824.25563	197582.21
Observations	352	352
Pearson Correlation	0.682652286	
Hypothesized Mean Difference	0	
df	351	
t Stat	-19.91772907	
P(T<=t) one-tail	6.68519E-60	
t Critical one-tail	1.6492064	
P(T<=t) two-tail	1.33704E-59	
t Critical two-tail	1.966745561	

b. Confidence Interval for Two Proportions:

INSTNM	STABBR	Scholarship Amt in $
California Christian College	CA	1059
Casa Loma College-Van Nuys	CA	1026
CET-Salinas	CA	1038
BJORNS HAIRSTYLING ACADEMY	CA	1042
Alliant International University-San Diego	CA	1029
Chabot College	CA	1070
Academy of Art University	CA	1082
University of California-Hastings College of Law	CA	1084
CET-San Diego	CA	1012
Phillips Graduate University	CA	1054
Chapman University	CA	1061

CET-Watsonville	CA	1072
University of California-Santa Barbara	CA	1047
Citrus College	CA	1016
College of Alameda	CA	1070
Allan Hancock College	CA	1055
Bellus Academy-National City	CA	1014

Clovis Adult Education	CA	1183
CALIFORNIA PARAMEDICAL AND TECHNICAL COLLEGE	CA	1177
University of California-San Diego	CA	1104
Butte College	CA	1173
Alliant International University	CA	1103
Antelope Valley College	CA	1158
California College San Diego	CA	1106
California State University-Long Beach	CA	1111
Cerro Coso Community College	CA	1200
University of California-Davis	CA	1135
The Academy of Radio and TV Broadcasting	CA	1124
Columbia College Hollywood	CA	1104
Biola University	CA	1172
California State University-San Bernardino	CA	1195

NUMBER OF UNIVERSITIES IN THE GROUP = 352(n).
Usual care of universities selected randomly from the data set:

X1 =14

P1 = x1/n -> 14/352 = 0.039773

NUMBER OF UNIVERSITIES IN THE GROUP = 352(n).
Extra care of universities selected randomly from the data set:

X2 =17

P2 = x2/n -> 17/352 = 0.048295455

(p1 - p2) + or – zα/2 √ p1(1- p1) /n + p2(1 - p2)/ n 2

zα/2 = 1.960

0.000239+or -0.000958

c. Comparing Two Variance.

6. Analysis For Variance:
   a. Multiple Comparisons.

Tukey's studentized range test (sometimes called the HSD or "honestly significant difference" test). It has good power and is widely used. We will refer to it as Tukey's Understand and perform Tukey's test for paired means.
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test, named for statistician John Wilder Tukey (1915–2000).

The hypotheses to compare group j with group k are H0: µj 5 µk H1: µj Þ µk
Tukey's test statistic is

Tcalc =| y j 2 − y k |/ √ MSE[1 -/nj + 1/ nk]

We would reject H0 if Tcalc > Tc, n2c , where Tc,n2c is a critical value for the desired level of significance. Table 11.4 shows 5 percent critical values of Tc, n2c.

We take MSE directly from the ANOVA calculations (see Table 11.2). The MSE is the pooled variance for all c samples combined

7. Simple Regression:

The hypothesized relationship may be linear, quadratic, or some other form. For now we will focus on the simple linear model in

slope-intercept form:

Y = slope 3 X + y-intercept.

In statistics this straight-line model is often referred to as a simple regression equation. The slope and intercept of the simple regression equation are used to describe the relationship between the two variables. We define the Y variable as the response variable (the dependent variable) and the X variable as the predictor variable (the independent variable).

Prediction Using Regression:

One of the main uses of regression is to make predictions. Once we have a fitted regression equation that shows the estimated relationship between X (the independent variable) and Y (the dependent variable), we can plug in any value of X to obtain the prediction for Y. For example:

Rent 5 150 1 1.05 SqFt

The predicted rent on an 800-square-foot apartment is $990, that is,
Rent = 150 + 1.05 (800) = 990.
$E(Y \mid x) = \beta 0 + \beta 1\, x$ (simple regression equation)

$y = b0 + b1\, x$ (estimated regression equation)

Roman letters denote the coefficients b0 (the estimated intercept) and b1 (the estimated slope).

a. Regression Models.

When we propose a regression model, we might have a causal mechanism in mind, but cause and effect is not proven by a simple regression. We cannot assume that the explanatory variable is “causing” the variation we see in the response variable.

From the sample, we estimate the regression equation and use it to predict the expected value of Y for a given value of X:

Y hat = b0 + b1 x (estimated regression equation)

For a given value xi, the estimated value of the dependent variable is yi hat. The difference between the observed value yi and its estimated value yi hat is called a residual and is denoted ei .

Total number of degrees (HIGHDEG+PREDEG) per university for 352 universities.

b. Confidence and Prediction Intervals.

The regression line is an estimate of the conditional mean of Y, that is, the expected value of Y for a given value of X, denoted E(Y | xi).

Yhat ±tα/2 Se $+(xi - mean\ of\ x)2/\sum_{i=1}^{n}$

ILLUSTRATION STUDENT PRACTICAL HOURS AND LAB HOURS:

What is the relationship between the number of practical hours and the number of lab hours a university allocated for the students? We can estimate the regression line for these two variables using a sample of 352 universities.

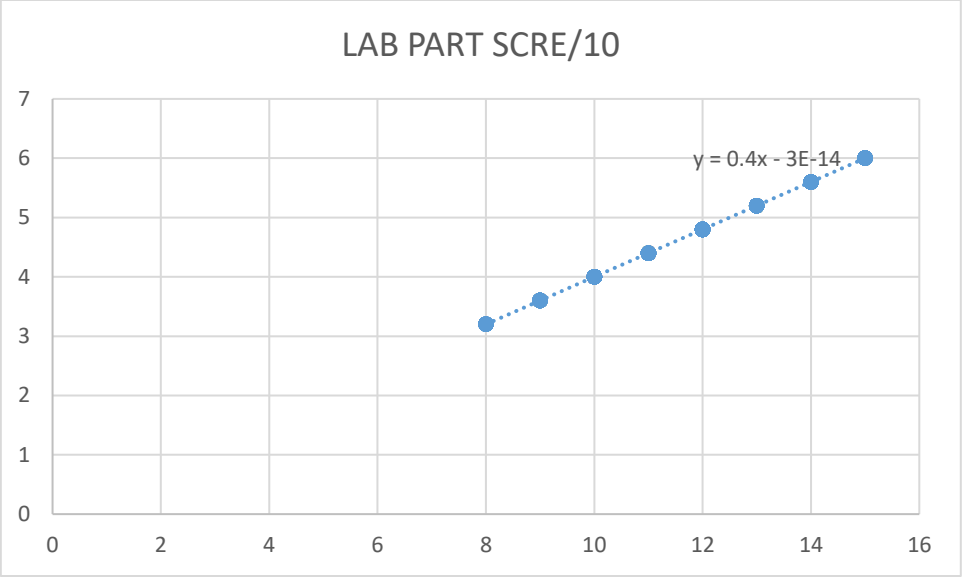
The vertical line segment will show the difference between the actual and fitted participation scores (i.e. Residuals).

Fitted Slope: b 1 = SS xy / SS xx.

Fitted Intercept: b0 = mean of y- b1 mean of x.

From this data set can find each university's expected lab score. Each prediction is a conditional mean, given the university's lab hours.

From a scatter plot, we could visually estimate the slope and intercept.



8. Multiple Regression:

a. Multiple Regression.

Multiple regression extends simple regression to include several independent variables (called predictors). Multiple regression is required when a single-predictor model is inadequate to describe the true relationship between the dependent variable Y (the response variable) and its potential predictors (X1, X2, . . .).

Regression Terminology The response variable (Y) is assumed to be related to the k predictors (X1, X2, . . . , Xk) by a linear equation called the population regression model: (13.1) y 5 β0 1 β1 x1 1 β2 x2 1 . . . 1 βk xk 1 ε A random error ε represents everything that is not part of the model. The unknown regression coefficients β0, β1, β2, . . ., βk are parameters and are denoted by Greek letters. Each coefficient βj shows the change in the expected value of Y for a unit change in Xj while holding everything else constant (ceteris paribus).

Here I calculated Y (tuition Fees) who has accommodation at the university. In my data set indicate as the students accommodation at the University 1= Yes, 0 = No.

Illustration: Tuition Fees:

Definition of Variable	Short Name
Y Tuition Fees (thousands of dollars)	Price
X1-Scolorship Amt in $(thousands of dollars)	Price
X2-Percentage of Stud Adm-%	Student Number in Percentage

X3-Accommodation (Yes=1, No=0)	0 and 1
X4- Accommodation Fees=10%(Tuit.Fe)	Price
X5 - Health Insurance= 5%(Tuit.Fee)	Price

Price (Tuition Fees) = β0 (LIB+COURSEF+OTHHER) + β1 Health Insurance + β2 Students Accommodation+ β3 EXAMINATION FEES (50%(T.F)+ ε.

From my data set the value of n = 352.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.683419
R Square	0.467061
Adjusted R Square	0.462467
Standard Error	325.8942
Observations	352

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	32391309	10797103	101.6609	2.83E-47
Residual	348	36960047	106207		
Total	351	69351356			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*
Intercept	-146.967	400.4957	-0.36696	0.713871	-934.663	640.73	-934.663
LIB+COURSEF+OTHHER	36.50565	43.99489	0.82977	0.407238	-50.0237	123.035	-50.0237
HEALTH INS	3.423034	56.71786	0.060352	0.95191	-108.13	114.976	-108.13
EXAMINATION FEES(50%(T.F)	-31.0435	39.38929	-0.78812	0.431163	-108.515	46.4275	-108.515

We can use the fitted regression model to make predictions for various assumed predictor values. For example, what would be the expected tuition fees for the student if library cost of 2813, with health insurance with 334.5 ,and examination fees 3163? In the fitted regression equation, we simply plug PREDICTED PER TERM: 2813,334.5,3163

Y = CONSTANT+B1*(X1)+B2*(X2)+B3(X3)+B1(X4)

Y = -146.9665899+2813*36.50565+334.5*3.423034+3163*-31.0435 = 5497.808

CONCLUSION

I analyzed my data by using bar chart, pie chart to describe the student's salary. I used descriptive analysis to determine the student's information.

Although the students get scholarship amount to reduce their fee structure, they have to work for other expenses for their education. To overcome from this issue, I created some independent variable of on campus job, working hours, salary in dollar, etc.

In addition to this, I evaluated total number students admitted in each colleges, so created some other variables called percentage of students admitted, total number seats allocated by the US government, number of vacancy seats available etc..