Market Research and Survey Analysis Project

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IST 230, Sections 2 and 3
The Pennsylvania State University
Dr. Mudgett

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Introduction

IST 230 is a core IST class required to be taken by all IST students. The course curriculum covers many areas of discrete mathematics, including logic, basic number theory, cryptography, graph theory, and functions. Keeping in line with the goals of IST, continuous quality improvement is essential to ensure the highest quality education. To evaluate past and previous IST 230 courses, as well as to evaluate the current course, Dr. Mudgett has assigned a project team to conduct a survey of IST students. The survey is intended to gather information regarding the needs and desires of IST students as they relate to IST 230. The results of this survey will serve as a planning tool for future sections of IST 230.

Project Overview

This project team was comprised of three groups from Dr. Mudgett's IST 230 sections in the fall of 2002. The new project team was then divided into three new groups based on the knowledge and interests of the team members. This allowed for a mix of the previous groups and aided in communication flow between groups. The survey development team was responsible for designing the survey and making the survey accessible to the target population. The distribution team was responsible for contacting IST professors and distributing the survey to students. The analysis team was responsible for analyzing the data collected and identifying trends in the data.

The team decided to use a web interface for the survey. This allowed the survey input to be directly inserted into a database, streamlining the data collection process. This also allowed the project team to access the data and to ensure data integrity. Quality control was attempted by verifying IP addresses and timestamp.

Survey questions were initially formed from Dr. Mudgett's proposal and the development team's input. Working with Dr. Mudgett, multiple revisions of the survey were created. During this process, different structures were evaluated for question and response format. Each item on the survey was analyzed completely to ensure clarity of questions and to remove any obvious bias. The survey was then finalized, approved by Dr. Mudgett and Dean Lambert, and given to the distribution team. A test of the survey was issued to a section of Dr. Mudgett's IST 230 class to gather test data to evaluate the structure and content of the survey and data collection system. The test pilot data and records that were identifiable as outside of the timestamp / IP range were removed from the data set. Access to this test data was given to the analysis team for evaluation before the final survey approval.

The distribution team formulated a list of potential IST classes to conduct survey distribution during class times. Classes had to be in a computer lab to allow online access to the survey. Classes were also analyzed for common student overlaps and considered accordingly to minimize duplicate data. Representatives of the distribution team then administered the survey to scheduled IST classes. A list of the IST courses in which the survey was distributed to can be found in Appendix U. Due to lack of response from all IST professors in allowing the survey to be conducted in their classes, a general email was sent out via the IST listserv to all IST students

asking them to take the survey. It was requested that no student take the survey more then once. However, IP and timestamp filtering did not work for these results, and thus data integrity cannot be guaranteed. Total response to the survey after removal of illegitimate data was approximately 275 results.

After the completion of the survey distribution, the analysis team was granted access to the survey data. They proceeded to analyze the data using Excel and MiniTab, a statistical analysis software package. The following is a discussion of the information formed from this data, conclusions and recommendations.

Data Analysis

After the data was compiled in the SQL database, the analysis team began to sort through the data. To determine if there were any statically significant trends, we used chi-square tests. Chi-square tests are used to examine the relationship between subjects' scores on two categorical variables. Our group also determined what fields the students who took the survey were most interested in, what fields they thought IST 230 was most relevant in, as well as what the students were using in their internships.

The analysis began with the extraction of the data from the SQL server. From there it was placed into an Excel Spreadsheet and deletion of invalid survey responses was completed. The data was analyzed using a statistical software package called Minitab. Using Minitab, the counts and percentages of each variable were obtained. Excel graphs were created and compiled using the tally results from Minitab. Finally, in an effort to find future trends, Chi-square analyses were used to determine relationships between specific variables.

Chi-square analysis was initially attempted to prove relationships and trends statistically. As an example, we will examine the question “Is there relationship between the relevancy of discrete math to that of math to future career goals?” The null hypothesis in this case is that there is no relationship between the relevancy discrete math and relevancy of math to career goals. Alternative hypothesis is that there is a relationship between relevancy of discrete math and relevancy of math to career goals.

Since we are not using an independent sample, we cannot do a Z-Test of the difference of two proportions. Independent samples available from two populations are necessary for a Z-Test. So we will instead do a chi-square analysis to test the two proportions. The necessary conditions for a chi-square analysis is that the expected counts must be greater than 1 and that at least 80% of the cells should have an expected count greater than 5. Both of these conditions are met

Using the significance level of $\alpha = .05$, we can reject the null hypothesis since the p-value is significantly small (i.e. $\alpha=.05>$p-value$=.000$) and accept the alternative hypothesis that there is a relationship between relevancy of discrete math and relevancy of math to career goals. Here there is a possibility of a type 1 error, since the null hypothesis was rejected in favor for the

alternative. Here the probability of us committing a type 1 error is 5% or the alpha level that we used.

After the chi-square analyses, other forms of data analyses were conducted. These are some of the relationships our analysis has turned up:

- Appendix A represents a comparison of IST option to interest in discrete mathematics after completion of the course. As seen in the data set chart, the systems option has the highest interest with over 70% of its population having a positive interest. In contrast, the context and technology options have an approximate 40% positive interest in each of the two populations, representing the minority of its population. When evaluating this information with Data R, it is seen that the majority of the sample population comes from the technology option (Approx. 60%). Systems represent 24% of the sample population. Context represents 13% of the sample population. Thus, when the 70% figure within the systems population is applied, approximately 17% of the total population is represented by this positive response within the systems population.

  Conclusion: *The majority of the sampled population does not have a positive interest of discrete mathematics.*

- Appendix D represents a comparison of relevance of discrete mathematics to students while taking the course compared to their views after taking the course. As seen in the data set chart, most views remained the same during and after the course. The number of people that switched to a negative relevancy was almost equally matched by the number who switched to a positive relevancy. Furthermore, the number of sampled that changed their position was relatively small representing approximately 18% of the sample population that has completed the course.

  Conclusion: *Views of discrete mathematics don't change over time in any significant way. A student's view will most likely remain the same before, during, and after the course.*

- Appendices E – K represents a comparison of IST options to interests in selected topic areas relevant to discrete mathematics. As seen in the data set chart, there are a varying range of interests among the various options, with no option consistently having the highest interest throughout.

  Conclusion: *IST students have a varying interest in the areas of discrete mathematics. Many of their interest can be seen in relation to their option. For example, systems options lead the programming and algorithm creation interests, while technology options lead the situation management and AI interests.*

- Appendix L represents a comparison of academic standing to the relevancy of discrete mathematics while taking the course. As seen in the data set chart, there is an increased positive relevance from sophomore to junior year. The senior year is comparable to the sophomore year.

Conclusions: *In the opinion of this team, this trend represents an increased requirement for discrete mathematics caused by the heavy emphasis on Java within the junior's curriculum. We feel the senior's results are tainted because of the format and infancy of their courses when they took discrete mathematics and other courses. This is our opinion and is not backed by data.*

- Appendix M represents a comparison of students who have and have not completed an internship and their views on the relevancy of discrete mathematics after course completion. There is a general decrease in positive relevancy response in those that have completed an internship as compared to those who have not.

  Conclusion: *Many students have found that there is little need for skills learned in discrete mathematics in their internship environments.*

- Appendix N represents a comparison between participation in Problem Based Learning and its aiding in students learning concepts. As seen in the data set chart, there is an increased positive relevancy of understanding concepts in a PBL course as compared to a non-PBL course.

  Conclusion: *PBL aides in students' comprehension of course material. Note: this was not evaluated to a specific learning environment, but rather from the whole of a student's experience.*

- Appendices O and P represent a comparison between students interests and what they feel is relevant to their future occupational needs. As seen in the data chart, there is no real correlation between the two sets of data; however, it is interesting for course planning purposes.

  Conclusion: *There is no true trend between students' interests and what skills they feel they will need in their occupation. However, this does highlight some areas that seem rather specialized in students work experience, such as public policy and cryptography. The data also highlights certain areas which seem to be in rather heavy demand, such as networking and programming. In should be noted that a large majority of the sampled population are in the technology option and the results should be weighted accordingly.*

- Appendix S is a look at the grade composition of students who have completed IST 230. This information may be relevant to discrete math course instructors. There is no significant trend here, however.

- Appendix T represents the academic standing of the sampled population. It should be noted that 45% of the sampled population are juniors as compared to the 20%, 15% and 18% representation of the freshman, sophomore and senior sampled populations respectively.

  Conclusion: *Due to the skewed percentage of juniors in comparison to all others surveyed, there may be more weight and accuracy in the responses given by the juniors. In most of the data comparisons that were used in this analysis, percentages were used minimizing the*

weight that must be given to the junior sampled population. However, due to their larger sampled population their responses may be seen as a more accurate portrayal of the juniors' views.

Recommendations

Short Term

- Use information provided this survey to tailor discrete math courses to the interests of the majority of students within the class. For example, if 75% of the class is technology options, the course content should have an emphasis on what technology options favor as shown by our analysis.

Long Term

- Make IST 230 a requirement for only the systems development option.
- Provide different sections of IST 230 for different areas of interest or options. Tailor each course to meet the needs of a different level of involvement, possibly based on the interests of the three IST options' views as shown by our analysis.
- Make IST 230 a 400 level course, allowing it to become an option for students in a certain option.

Influencing Factors and Accuracy of Data

Throughout this survey we sought to maintain the highest level of accuracy possible. The following are points that may have introduced inaccuracy into our results.

- There is a high concentration of responses from technology options.
- There is a high concentration of responses from juniors.
- Duplicate responses may have been caused by a sampler taking the survey more then once. By emailing the survey link to the entire IST population, extraneous data could not be identified and removed using IP and Timestamp.
- Non-response bias was a factor, as response to the survey was voluntary and participation was not a hundred percent. Also, selection bias occurred unwittingly because only select classes were specifically invited, during labs, to take the survey.

Comments and Afterthoughts

- More time for analysis would result in more in-depth conclusions.
- If the project were to be repeated, higher quality controls would be established by ensuring that the survey was only taken within a controlled environment and the questions would be phrases slightly differently to avoid any confusion.

Appendix A

Tabulated Statistics: f5, f9

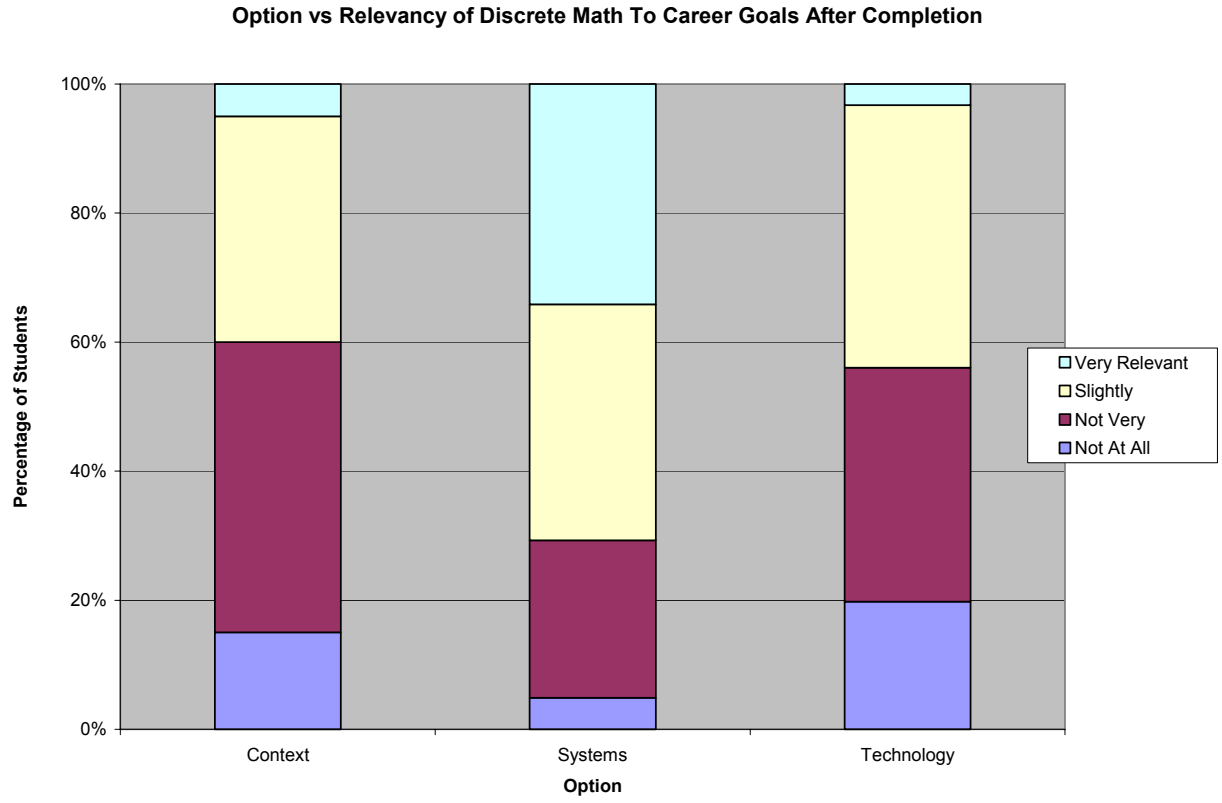
What is your IST option?

Do you find mathematics relevant to your career goals now that you have completed discrete math?

Rows: f5 Columns: f9

	have not	not at a	not very	slightly	very rel	All		
context	11	3	11	7	1	33	significant	very s.
	33.33	9.09	33.33	21.21	3.03	100.00	36%	5%
	11	3	11	7	1	33		
systems	19	2	11	16	16	64		
	29.69	3.13	17.19	25.00	25.00	100.00	71%	36%
	19	2	11	16	16	64		
technology	42	24	35	49	7	157		
	26.75	15.29	22.29	31.21	4.46	100.00	49%	6%
	42	24	35	49	7	157		
non ist	9	0	0	2	1	12		
	75.00	--	--	16.67	8.33	100.00	-	-
	9	0	0	2	1	12		
All	81	29	57	74	25	266		
	30.45	10.90	21.43	27.82	9.40	100.00		
	81	29	57	74	25	266		

Chi-Square =



45.677, DF = 12, P-Value = 0.000

Appendix B

Tabulated Statistics: f3, f8

What is the highest level of math you have completed?
When you were taking discrete math, did you find discrete math relevant?

Rows: f3 Columns: f8

	have not	not at a	not very	slightly	very rel	All		
algebra	19	2	2	4	1	28	significant	very s.
	67.86	7.14	7.14	14.29	3.57	100.00	56%	11%
	19	2	2	4	1	28		
beyond c	10	4	3	16	7	40		
	25.00	10.00	7.50	40.00	17.50	100.00	77%	23%
	10	4	3	16	7	40		
calculus	55	24	48	59	13	199		
	27.64	12.06	24.12	29.65	6.53	100.00	50%	9%
	55	24	48	59	13	199		
All	84	30	53	79	21	267		
	31.46	11.24	19.85	29.59	7.87	100.00		
	84	30	53	79	21	267		

Chi-Square = 30.525, DF = 8, P-Value = 0.000

Appendix C

Tabulated Statistics: f3, f9

What is the highest level of math you have completed?
Do you find mathematics relevant to your career goals now that you have completed discrete math?

Rows: f3 Columns: f9

	have not	not at a	not very	slightly	very rel	All		
algebra	15	3	3	7	0	28	significant	very s.
	53.57	10.71	10.71	25.00	--	100.00	54%	0%
	15	3	3	7	0	28		
beyond c	12	2	8	9	9	40		
	30.00	5.00	20.00	22.50	22.50	100.00	64%	32%
	12	2	8	9	9	40		
calculus	56	24	47	59	16	202		
	27.72	11.88	23.27	29.21	7.92	100.00	51%	11%
	56	24	47	59	16	202		
All	83	29	58	75	25	270		
	30.74	10.74	21.48	27.78	9.26	100.00		
	83	29	58	75	25	270		

Chi-Square = 19.862, DF = 8, P-Value = 0.011
4 cells with expected counts less than 5.0

Appendix D

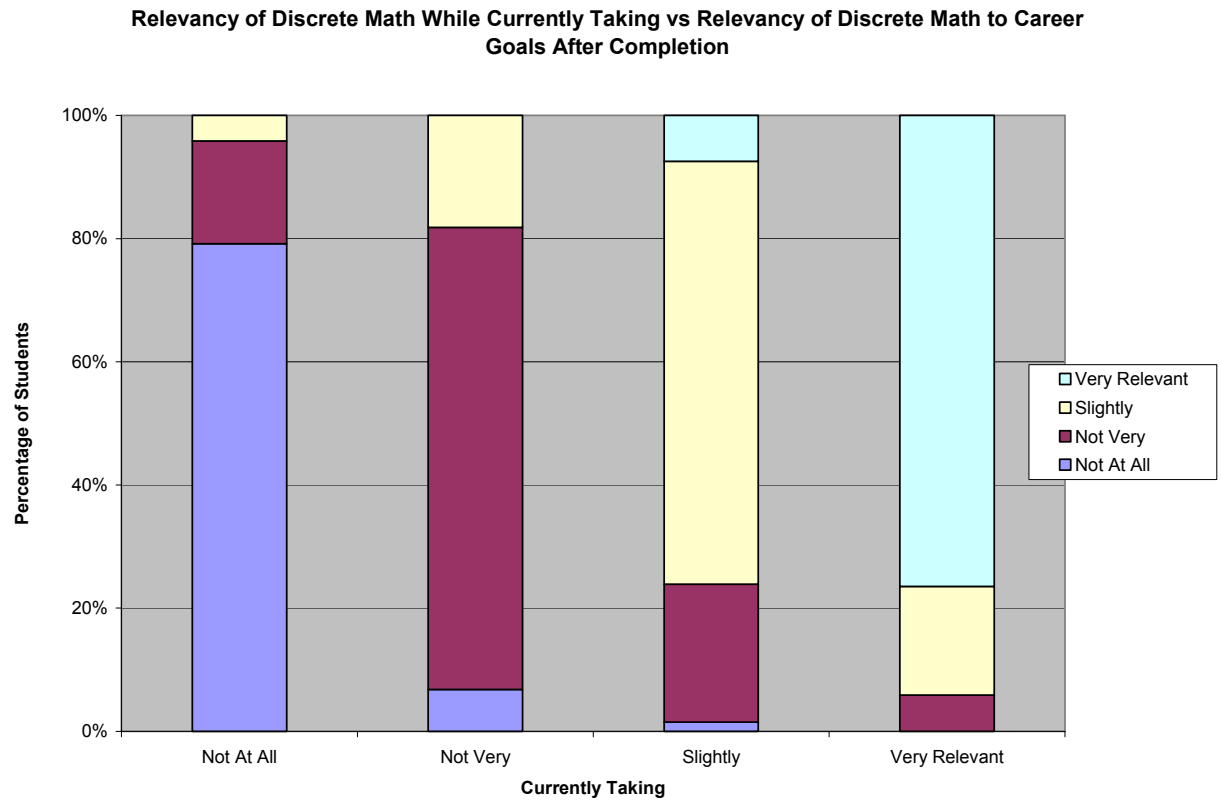
Tabulated Statistics: f8, f9

When you were taking discrete math, did you find discrete math relevant?
Do you find mathematics relevant to your career goals now that you have completed discrete math?

Rows: f8 Columns: f9

	not at a	not very	slightly	very rel	All
not at a	19	4	1	0	24
	79.17	16.67	4.17	--	100.00
	19	4	1	0	24
not very	3	33	8	0	44
	6.82	75.00	18.18	--	100.00
	3	33	8	0	44
slightly	1	15	46	5	67
	1.49	22.39	68.66	7.46	100.00
	1	15	46	5	67
very rel	0	1	3	13	17
	--	5.88	17.65	76.47	100.00
	0	1	3	13	17
All	23	53	58	18	152
	15.13	34.87	38.16	11.84	100.00
	23	53	58	18	152

Chi-Square = 206.723, DF = 9, P-Value = 0.000



Appendix E

Tabulated Statistics: f5, f10

What is your IST option?

I have an interest in one or more programming languages.

Rows: f5 Columns: f10

	Agree	Disagree	Strongly	Strongly	All	
context	17	14	3	0	34	significantly
	50.00	41.18	8.82	--	100.00	59%
	17	14	3	0	34	
systems	27	2	35	1	65	
	41.54	3.08	53.85	1.54	100.00	95%
	27	2	35	1	65	
technology	87	22	36	10	155	
	56.13	14.19	23.23	6.45	100.00	79%
	87	22	36	10	155	
non ist	2	3	3	4	12	
	16.67	25.00	25.00	33.33	100.00	42%
	2	3	3	4	12	
All	133	41	77	15	266	
	50.00	15.41	28.95	5.64	100.00	n/a
	133	41	77	15	266	

Chi-Square = 67.539, DF = 9

Appendix F

Tabulated Statistics: f5, f14

What is your IST option?

I want to be able to create efficient computer algorithms (such as web search engines).

Rows: f5 Columns: f14

	Agree	Disagree	Strongly	Strongly	All	
context	14	14	6	0	34	significantly
	41.18	41.18	17.65	--	100.00	59%
	14	14	6	0	34	
systems	32	2	31	0	65	
	49.23	3.08	47.69	--	100.00	97%
	32	2	31	0	65	
technology	68	50	28	11	157	
	43.31	31.85	17.83	7.01	100.00	61%
	68	50	28	11	157	
non ist	5	5	1	1	12	
	41.67	41.67	8.33	8.33	100.00	n/a
	5	5	1	1	12	
All	119	71	66	12	268	
	44.40	26.49	24.63	4.48	100.00	n/a
	119	71	66	12	268	

Chi-Square = 45.468, DF = 9

Appendix G

Tabulated Statistics: f5, f15

What is your IST option?

I want to be able to apply principles of artificial intelligence or formal languages.

Rows: f5 Columns: f15

	Agree	Disagree	Strongly	Strongly	All	
context	21	11	2	0	34	significantly
	61.76	32.35	5.88	--	100.00	71%
	21	11	2	0	34	
systems	32	13	20	0	65	
	49.23	20.00	30.77	--	100.00	80%
	32	13	20	0	65	
technology	73	51	18	14	156	
	46.79	32.69	11.54	8.97	100.00	58%
	73	51	18	14	156	
non ist	7	4	0	1	12	
	58.33	33.33	--	8.33	100.00	n/a
	7	4	0	1	12	
All	133	79	40	15	267	
	49.81	29.59	14.98	5.62	100.00	n/a
	133	79	40	15	267	

Chi-Square = 28.685, DF = 9

Appendix H

Tabulated Statistics: f5, f16

What is your IST option?

I want to be able to analyze networks, such as communications, transportation, or logistical networks.

Rows: f5 Columns: f16

	Agree	Disagree	Strongly	Strongly	All	
context	18	7	8	1	34	significantly
	52.94	20.59	23.53	2.94	100.00	76%
	18	7	8	1	34	
systems	31	13	21	0	65	
	47.69	20.00	32.31	--	100.00	80%
	31	13	21	0	65	
technology	72	15	67	3	157	
	45.86	9.55	42.68	1.91	100.00	89%
	72	15	67	3	157	
non ist	5	3	2	2	12	
	41.67	25.00	16.67	16.67	100.00	n/a
	5	3	2	2	12	
All	126	38	98	6	268	
	47.01	14.18	36.57	2.24	100.00	n/a
	126	38	98	6	268	

Chi-Square = 23.843, DF = 9

Appendix I

Tabulated Statistics: f5, f17

What is your IST option?

I want to be able to manage situations where there are significant uncertainties which might affect the performance of things that are important to me.

Rows: f5 Columns: f17

	Agree	Disagree	Strongly	Strongly	All	
context	22	1	11	0	34	significantly
	64.71	2.94	32.35	--	100.00	97%
	22	1	11	0	34	
systems	43	6	15	1	65	
	66.15	9.23	23.08	1.54	100.00	89%
	43	6	15	1	65	
technology	105	8	38	3	154	
	68.18	5.19	24.68	1.95	100.00	93%
	105	8	38	3	154	
non ist	5	2	5	0	12	
	41.67	16.67	41.67	--	100.00	n/a
	5	2	5	0	12	
All	175	17	69	4	265	
	66.04	6.42	26.04	1.51	100.00	n/a
	175	17	69	4	265	

Chi-Square = 7.828, DF = 9

Appendix J

Tabulated Statistics: f5, f18

What is your IST option?

I want to be able to design or develop complex, interconnected computer programming applications.

Rows: f5 Columns: f18

	Agree	Disagree	Strongly	Strongly	All	
context	8	15	7	4	34	significantly
	23.53	44.12	20.59	11.76	100.00	44%
	8	15	7	4	34	
systems	39	3	23	0	65	
	60.00	4.62	35.38	--	100.00	95%
	39	3	23	0	65	
technology	69	55	18	14	156	
	44.23	35.26	11.54	8.97	100.00	56%
	69	55	18	14	156	
non ist	4	6	0	2	12	
	33.33	50.00	--	16.67	100.00	n/a
	4	6	0	2	12	
All	120	79	48	20	267	
	44.94	29.59	17.98	7.49	100.00	n/a
	120	79	48	20	267	

Chi-Square = 50.980, DF = 9

Appendix K

Tabulated Statistics: f5, f19

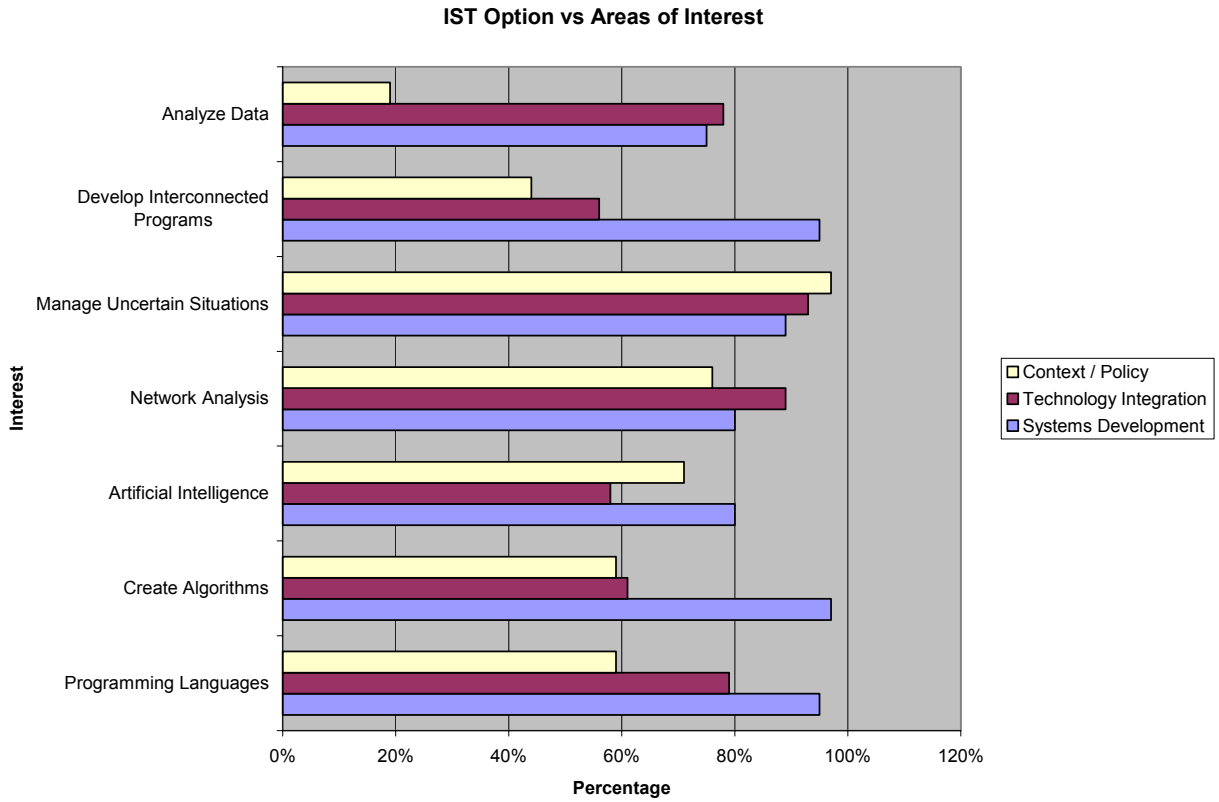
What is your IST option?

I want to be able to effectively analyze data, such as the results of experiments, surveys, or financial and economic reports.

Rows: f5 Columns: f19

	Agree	Disagree	Strongly	Strongly	All	
context	21	1	11	1	34	significantly
	61.76	2.94	32.35	2.94	100.00	19%
	21	1	11	1	34	
systems	35	15	14	1	65	
	53.85	23.08	21.54	1.54	100.00	75%
	35	15	14	1	65	
technology	84	29	37	6	156	
	53.85	18.59	23.72	3.85	100.00	78%
	84	29	37	6	156	
non ist	9	3	0	0	12	
	75.00	25.00	--	--	100.00	n/a
	9	3	0	0	12	
All	149	48	62	8	267	
	55.81	17.98	23.22	3.00	100.00	n/a
	149	48	62	8	267	

Chi-Square = 12.039, DF = 9



Appendix L

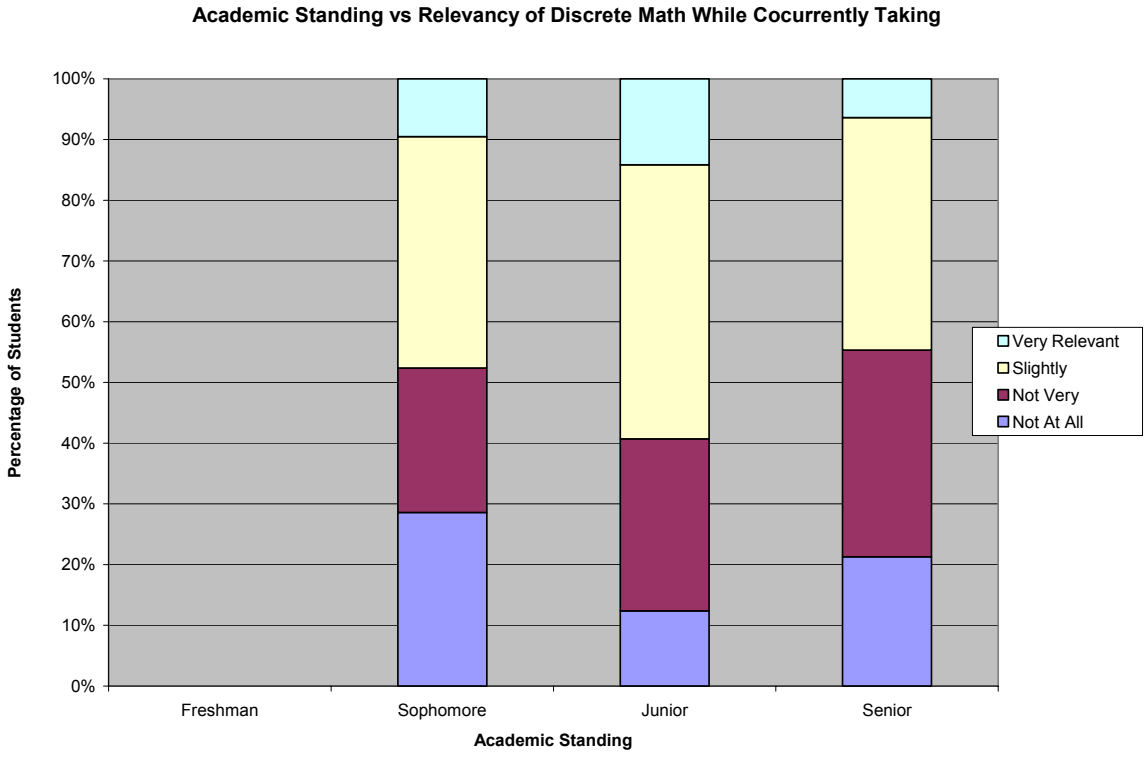
Tabulated Statistics: f1, f8

What is your academic standing?

When you were taking discrete math, did you find discrete math relevant?

Rows: f1	Columns: f8							
	have not	not at a	not very	slightly	very rel	All		
freshman	53	0	0	1	0	54	sig.	extsig.
	98.15	--	--	1.85	--	100.00	n/a	
	53	0	0	1	0	54		
graduate	0	0	0	1	0	1		
	--	--	--	100.00	--	100.00	n/a	n/a
	0	0	0	1	0	1		
junior	10	14	32	51	16	123		
	8.13	11.38	26.02	41.46	13.01	100.00	59%	14%
	10	14	32	51	16	123		
senior	1	10	16	18	3	48		
	2.08	20.83	33.33	37.50	6.25	100.00	45%	6%
	1	10	16	18	3	48		
sophomor	20	6	5	8	2	41		
	48.78	14.63	12.20	19.51	4.88	100.00	48%	10%
	20	6	5	8	2	41		
All	84	30	53	79	21	267		
	31.46	11.24	19.85	29.59	7.87	100.00	n/a	n/a
	84	30	53	79	21	267		

Chi-Square = 177.511, DF = 16



Appendix M

Tabulated Statistics: f20, f9

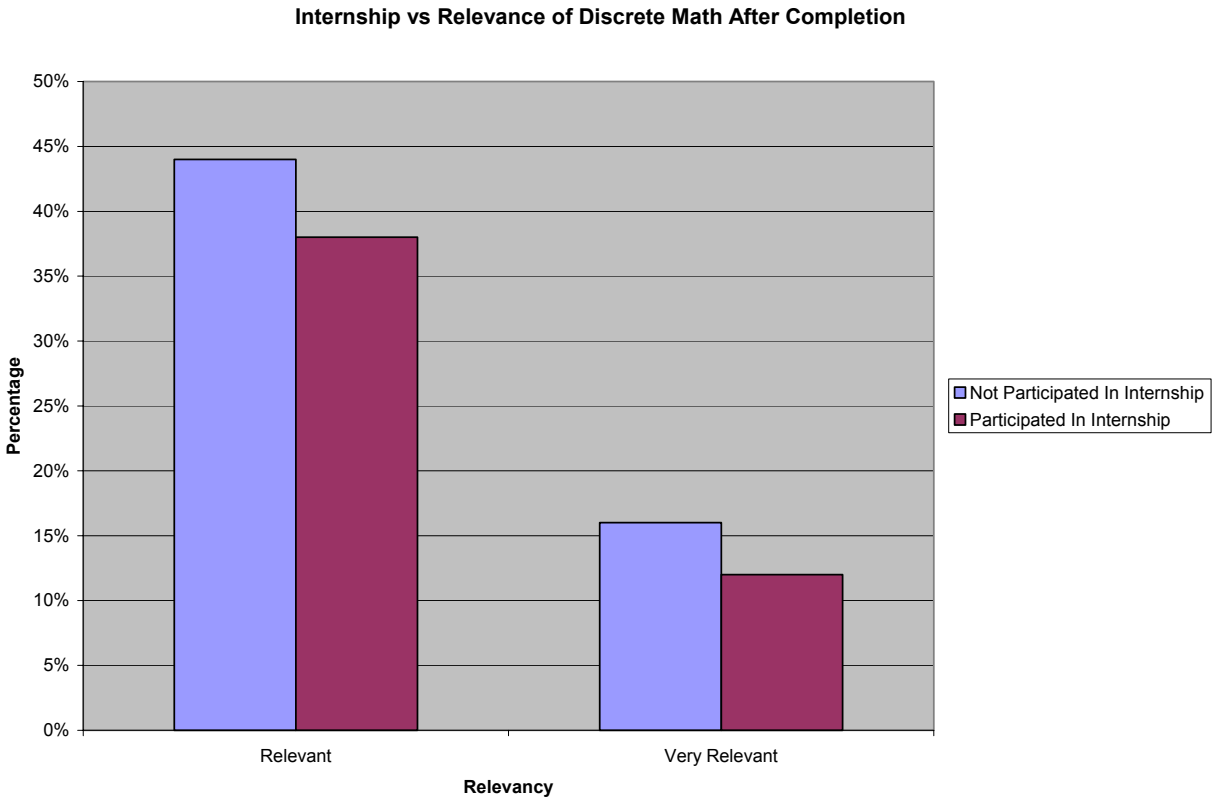
I have participated in an internship.

Do you find mathematics relevant to your career goals now that you have completed discrete math?

Rows: f20 Columns: f9

	have not	not at a	not very	slightly	very rel	All		
no	70	8	17	27	10	132	relevant	very r.
	53.03	6.06	12.88	20.45	7.58	100.00	44%	16%
	70	8	17	27	10	132		
yes	12	21	41	48	15	137		
	8.76	15.33	29.93	35.04	10.95	100.00	38%	12%
	12	21	41	48	15	137		
All	82	29	58	75	25	269		
	30.48	10.78	21.56	27.88	9.29	100.00		
	82	29	58	75	25	269		

Chi-Square = 63.592, DF = 4, P-Value = 0.000



Appendix N

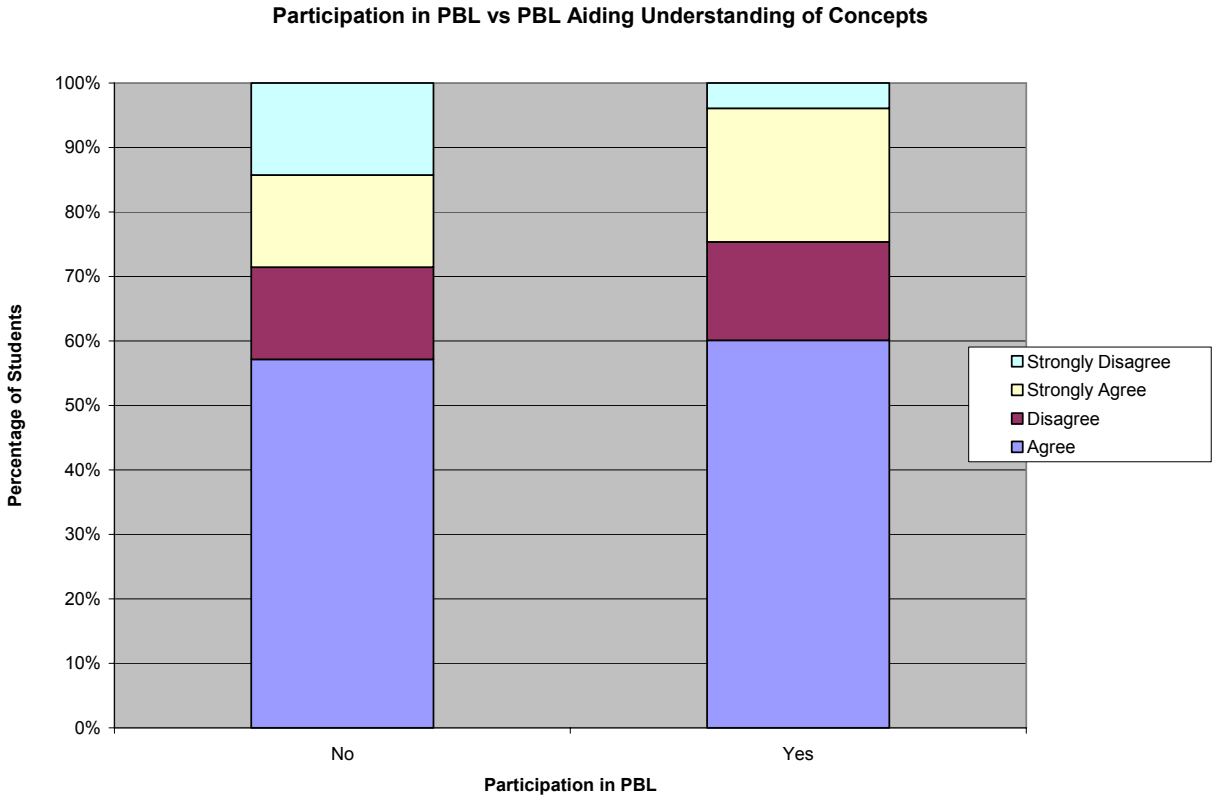
Tabulated Statistics: f23, f24

I have participated in Problem Based Learning?
Problem based learning helped me understand course objectives.

Rows: f23 Columns: f24

	Agree	Disagree	Strongly	Strongly	All	
no	4	1	1	1	7	
	57.14	14.29	14.29	14.29	100.00	
	4	1	1	1	7	
yes	122	31	42	8	203	
	60.10	15.27	20.69	3.94	100.00	81%
	122	31	42	8	203	
All	126	32	43	9	210	
	60.00	15.24	20.48	4.29	100.00	
	126	32	43	9	210	

Chi-Square = 1.839, DF = 3



Appendix O

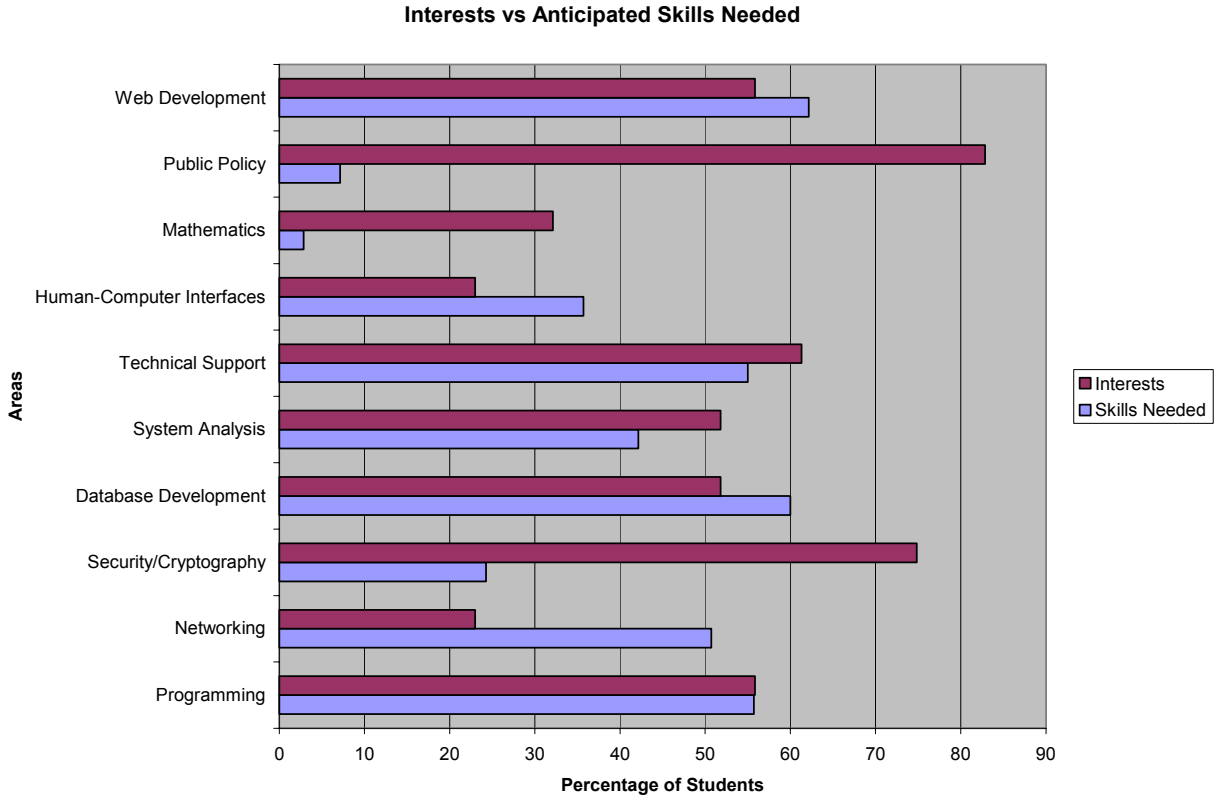
Interests of students:

Interests	Percent	Counts
Computer Programming	55.83942	153
Computer Engineering	22.9927	63
Networking	74.81752	205
Security/Cryptography	51.82482	142
Database Development	51.82482	142
Human-Computer Interfaces	61.31387	168
Mathematics	22.9927	63
Public Policy	32.11679	88
Web Development	82.84672	227
Business Problem Solving	55.83942	153
		274

Appendix P

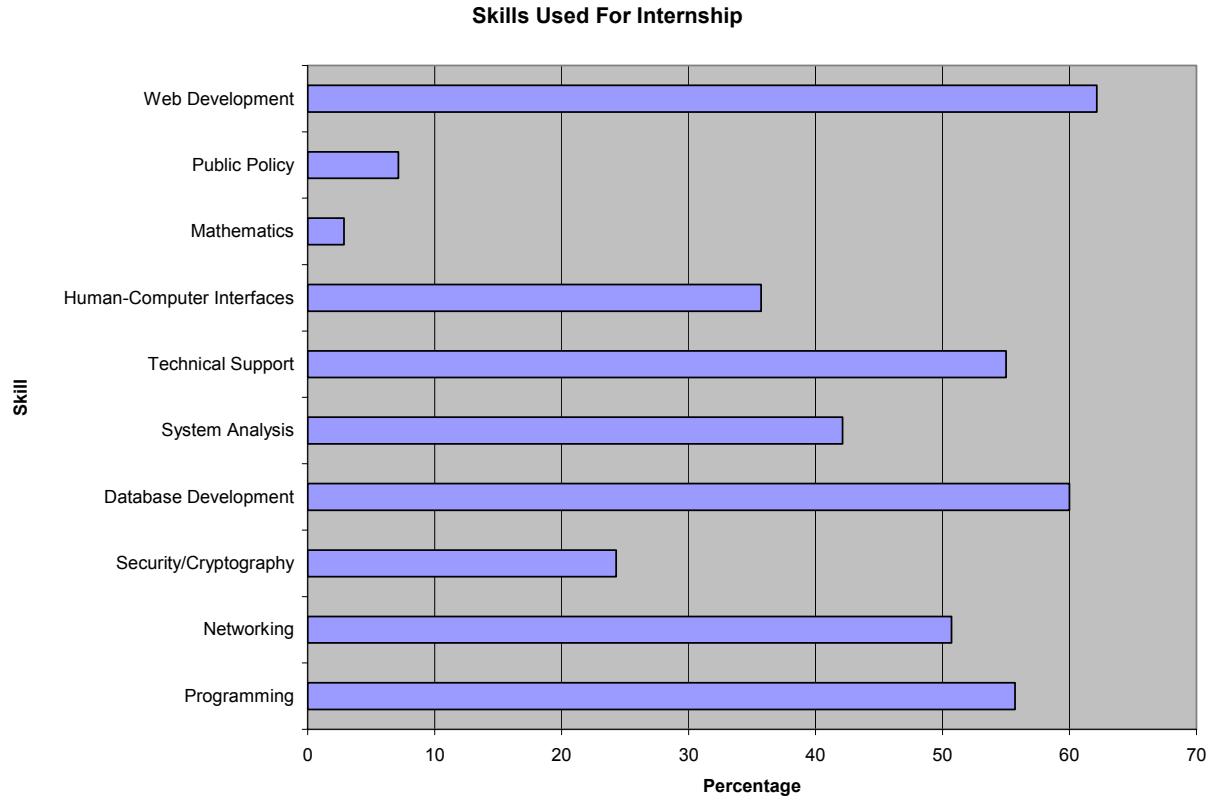
Anticipated skills needed:

Skills in the Future	Percent	Count
Computer Programming	57.81818	159
Computer Engineering	23.27273	64
Networking	70.54545	194
Security/Cryptography	43.63636	120
Database Development	57.81818	159
Human-Computer Interfaces	52.72727	145
Mathematics	26.54545	73
Public Policy	24	66
Web Development	74.54545	205
Business Problems	50.54545	139
		275



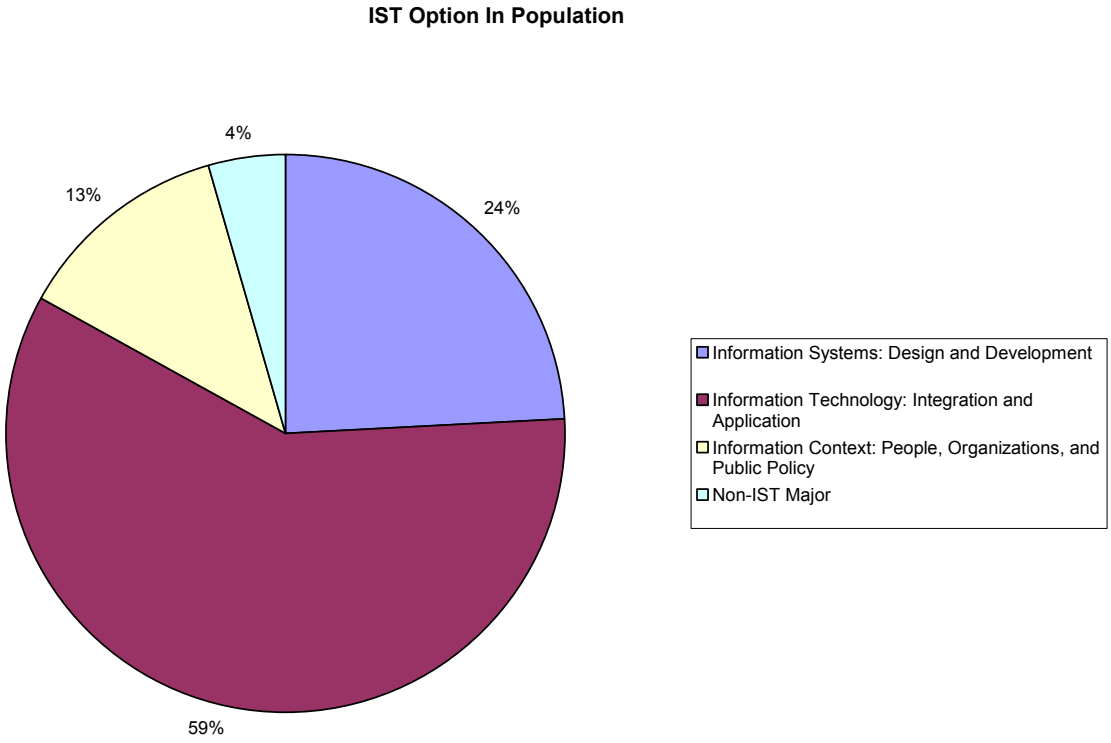
Appendix Q

Skills in Internship	Percent	Count
Programming	55.71429	78
Networking	50.71429	71
Security/Cryptography	24.28571	34
Database Development	60	84
System Analysis	42.14286	59
Technical Support	55	77
Human-Computer Interfaces	35.71429	50
Mathematics	2.857143	4
Public Policy	7.142857	10
Web Development	62.14286	87
		140



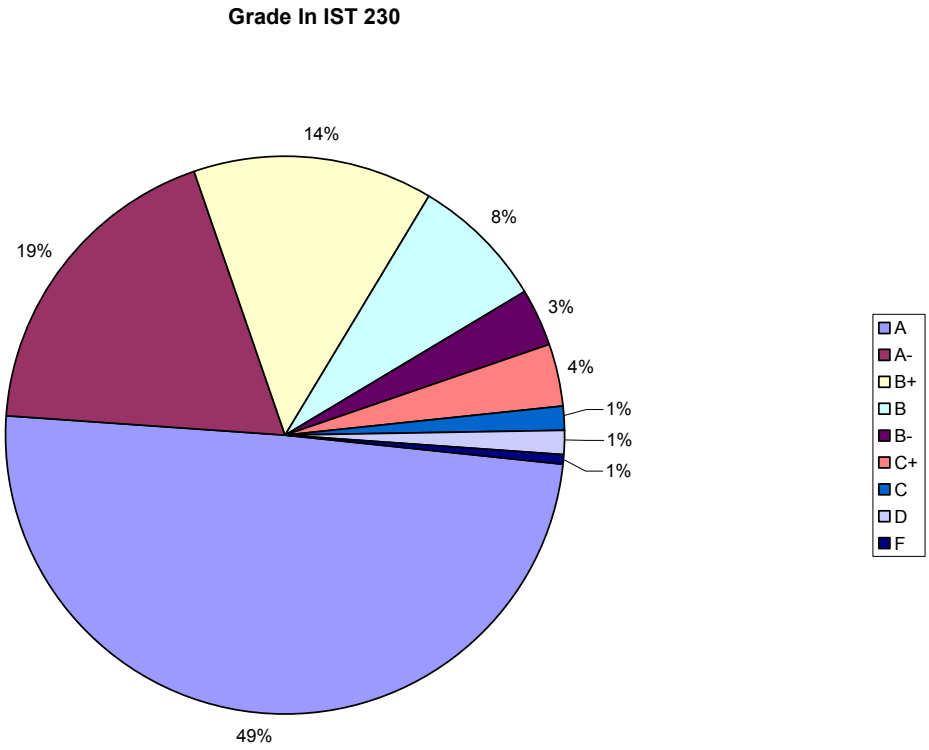
Appendix R

IST Option	Percent	Counts
Information Systems: Design and Development	24.07407	65
Information Technology: Integration and Application	58.88889	159
Information Context: People, Organizations, and Public Policy	12.59259	34
Non-IST Major	4.444444	12
		270



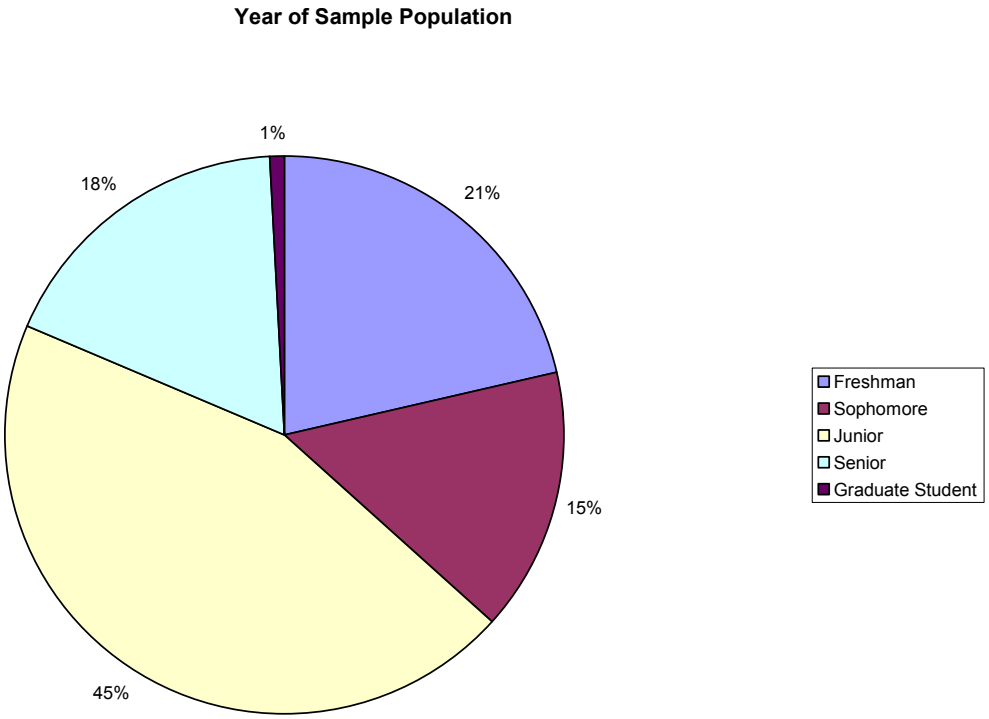
Appendix S

Grade in IST 230	Percent	Count
A	49.04459	77
A-	18.47134	29
B+	14.01274	22
B	7.643312	12
B-	3.184713	5
C+	3.821656	6
C	1.273885	2
D	1.273885	2
F	0.636943	1
		157



Appendix T

Standing	Percent	Count
Freshman	21.45455	59
Sophomore	15.27273	42
Junior	44.72727	123
Senior	17.81818	49
Graduate Student	0.727273	2
		275



Classes the survey was officially issued to inside the classroom:

IST 110 - Section 2
IST 110 - Section 4
IST 230 - Section 2
IST 230 - Section 3
IST 240 - Section 2
IST 311 - Section 1
IST 311 - Section 2
IST 331 - Section 1
IST 331 - Section 2
IST 497C - Section 1
IST 497E - Section 1*
IST 497H - Section 1*

* In both of these classes, IST majors were the minority so the instructors just asked the IST students in the class to complete the survey.