ASSESSMENT HANDBOOK

JOHN A. LOGAN COLLEGE
700 LOGAN COLLEGE ROAD
CARTERVILLE, IL 62918

2014 – 2018

MISSION STATEMENT:

WE ARE A DIVERSE LEARNING AND TEACHING COMMUNITY COMMITTED TO IMPROVING
INDIVIDUAL LIFE AND SOCIETY THROUGH HIGH-QUALITY, ACCESSIBLE
EDUCATIONAL PROGRAMS AND ENGAGED LEARNING OPPORTUNITIES.

Assessment Handbook
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Section I

History of Assessment

Assessment of academic achievement has a long history at John A. Logan College. The College's first efforts came about because of the 1997 Higher Learning Commission (HLC) reaccreditation visit that required a report on assessment. Over a period of years, nominal groups consisting of internal and external stakeholders identified eight general education goals for the College. With an external facilitator and faculty leadership, these nominal groups met annually to discuss expectations for student learning and to identify where in the curriculum these goals could be assessed. The major difficulty with this process was that goals were assessed on a four- year cycle and very little analysis of results was documented for improvement of student learning.

In 2006, the College recognized the need for a more purposeful and productive approach to assessment and applied to the Higher Learning Commission Assessment Academy. A new faculty representative and assessment team attended the 2006-2007 roundtable to develop a student learning project to close the loop on the College's assessment efforts. Over the course of four years in the Academy, John A. Logan College accomplished the following: 1) identification of the courses in the academic degree and certificate programs that use mathematical reasoning and communication skills; 2) development of a flexible student learning outcomes rubric for mathematical reasoning and communication skills; 3) piloted, analyzed and revised the rubric for communication and mathematical reasoning skills, and 4) retested the rubrics, analyzed and reported the results to appropriate stakeholders. This systematic approach served the College well and resulted in valuable information relative to the written communication learning outcome.

Section II

Assessment Academy 2014 - 2018

John A. Logan College recognized that assessment of student learning is central to its mission, and included it as one of 16 projects in the JALC Strategic Plan FY 2014-2018. In June 2014, John A. Logan College applied to the Higher Learning Commission's Academy for Assessment of Students Learning to serve as the Quality Initiative for the Open Pathway process. One of the first initiatives of this Assessment Academy Team was to examine the eight general education goals to determine if they reflected current academic learning outcomes, were valued by stakeholders, and were measurable. The Team recommended reducing the eight general education goals to five student learning outcomes which define the institution's commitment to student learning. The five student learning outcomes include: 1) Communication; 2) Critical Thinking; 3) Cultural and Global Awareness; 4) Information Literacy; and 5) Quantitative Reasoning (see Section III). In 2014, these outcomes were presented and approved by College Council and the Board of Trustees.

Another focus of this Assessment Academy was to build a sustainable process for the assessment of the five student learning outcomes. An Assessment Academy Team consisting of key faculty and administrators was formed to serve as liaisons and mentors in support of the assessment initiative. In addition to building a sustainable process, the Assessment Academy is devoted to changing the organization's culture from a compliance mentality to one of continuous improvement and effectiveness, which will ultimately improve teaching and learning at John A. Logan College.

The Assessment Academy Team approached the Academy work with great organization, detail, and processes that ensured good implementation for current and future cycles. One key difference during this Academy has been the ability to provide tangible results to faculty each semester. Other accomplishments early in the process included establishing a ten-year assessment cycle, mapping specific courses to the appropriate student learning outcome, developing common rubric and other essential tools vital to the assessment process (see Section IV).

Section III

Student Learning Outcomes

The faculty and staff of John A. Logan College are committed to providing students with opportunities to develop learning abilities that will last a lifetime. Graduates will be prepared to succeed in their personal and professional lives because of achieve competence in the following student learning outcomes:

<u>COMMUNICATION</u>: Students express thoughts, ideas, and feelings in both written and oral modes.

Students will: a) articulate and select appropriate purposes for reaching, writing, speaking, and listening, as individuals and in groups; b) engage in the stages of the written and oral communication process; c) select, organize, and present details to support a main idea; d) demonstrate knowledge of target audiences' expectations and values in the communication process; e) select appropriate rhetorical strategies for writing and speaking; f) apply appropriate reading strategies to comprehend literature, nonfiction, and academic texts.

<u>CRITICAL THINKING</u>: Students apply rational and methodical approach to problem solving based on use of appropriate evidence.

Students will: a) develop analytical skills to interpret, evaluate, and synthesize information across disciplines; b) interpret and evaluate statements, theories, problems, and observations from different points of view to make appropriate inferences; c) use evidence from a variety of credible sources, including literary texts, to support conclusions; d) apply principles that guide the aesthetic valuation of a work or movement within a discipline and articulate subjective preference; e) apply the scientific method, empirical methods, and/or testing processes as appropriate; and f) evaluate and relevance and credibility of evidence.

CULTURAL AND GLOBAL AWARENESS: **Students demonstrate an understanding of the influence of culture and society.**

Students will: a) identify the influence of history, geography, the arts, humanities, and the environment on individuals and their cultural development; and b) differentiate subjective opinions and ideologies based on social and individual bias from objective findings and data.

INFORMATION LITERACY: **Students locate, evaluate, retrieve, organize, create, and disseminate information.**

Students will: a) determine the extent of information needed; b) integrate relevant information from appropriate sources; c) use information legally and ethically in appropriate disciplines; and d) cite sources legally and ethically.

QUANTITATIVE REASONING: **Students use and understand numbers to interpret, evaluate, and express information in quantitative terms.**

Students will: a) interpret, analyze, and solve problems; b) differentiate among reasonable and plausible results; c) interpret, evaluate, and present data.

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Approved 4-22-14, Board of Trustees
Revised 9-15-14, Academic Assessment Team
Approved 9-25-14, College Council

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Section IV

Assessment Documents

Ten-Year Assessment Cycle (Appendix I)

The ten-year assessment cycle identifies the schedule for the planning, collecting and analyzing phases of assessment. The assessment of each student learning outcome begins with a planning phase, which includes the creation and/or review of the rubric to be used. The second phase begins each fall semester and includes the collection of assessment data. This collection of data continues over a four-semester period to compare fall to fall and spring to spring and results are shared with faculty each semester. After the fourth semester of collection, members of the Assessment Academy Team review and analyze the data collectively to look for common findings, improvements, and student strengths and weaknesses in an effort to assist with decision making and ultimately the improvement to student learning.

Student Learning Outcome Rubrics (Appendix II)

Peer reviewed rubrics published by the Association of American Colleges and Universities (AACU) provided a starting point for evaluation of artifacts collected from faculty members. A pilot of the first rubric constructed for Information Literacy revealed that it was not practical to use rubrics published by AACU but to utilize the criteria identified within each student learning outcome to develop a more practical rubric instead. During the planning phase in the spring semester, Assessment Academy Team members work with faculty to develop the rubric for the next student learning outcome to be assessed. Learning objectives are identified and listed on the left side of the rubric, and the scale for measuring student artifacts is provided with identifiers to assist faculty in scoring artifacts on a scale of 0 – 4. This rubric is piloted during the summer semester and revisions are made based on feedback from faculty participating in the pilot. During Fall 2015, the Assessment Academy Team conducted a rubric training workshop to familiarize faculty with the rubric and provide an opportunity to test the rubric with sample documents. After this initial training, the Assessment Academy Team conduct individual trainings as needed for rubrics as they are developed.

Faculty involvement in the development of the rubrics for each Student Learning Outcome is crucial. As of Fall 2016, three out of five rubrics have been developed for the Student Learning Outcomes.

Learning Outcomes Report ([Appendix III](#))

Foundational information gained from the first two years of the Assessment Academy included the importance of structured tools to provide institutional student learning data, increase faculty buy-in and improve student learning. Universal rubrics have been an effective tool to assess student learning, but they must be accompanied by a uniformed analysis, which is obtained through the Learning Outcomes Report.

The Learning Outcomes Report is a two-part form. The first part includes standard information such as instructor name, course, and semester; student learning outcome being assessed; definition of the assessment prompt; and faculty definition of criterion for success. Part two of the report provides an opportunity for faculty to document overall results of the assessment, student strengths and weaknesses identified in the process, and improvements to be implemented or results from improvements implemented as a result of the assessment. This documentation provides vital information for the Assessment Academy Team members to evaluate data after each four-semester cycle has been completed.

Excel Data Collection Document ([Appendix IV](#))

Excel spreadsheets are utilized to collect and compute student assessment scores. This document also includes standard information including instructor, course, semester, and student learning outcome. Student names are included, in addition to the ID numbers, to assist faculty in recording student scores.

Student scores are based on the criteria outlined within the rubric. Faculty feedback continues to assist in designing improvements to this spreadsheet. Improvements made for Fall 2016, include the addition of a summary section to calculate the number of students scoring 3 or 4 in all categories, which indicates student proficiency. This document can also assist in calculating student proficiency at both a course and department level.

Section V

John A. Logan College Assessment Website

Assessment documentation and results are available on the assessment page of the John A. Logan College website for faculty, staff and public viewing. In addition to the website, assessment results are available on the SharePoint server and presented to full-time and term faculty each semester during the Faculty/Staff In-Service Day and Term Faculty Orientation. An example of each piece of the assessment documentation collected every fall and spring semester is included in Appendix V.

Section VI

Future Direction

The Assessment Academy Team continues to remain consistent with the project model and is in alignment with the assessment cycle timeline. Faculty involvement is key in increasing communication and training new faculty to the assessment process. It is important to continue to review courses mapped to the student learning outcomes each semester to ensure that new courses and/or programs are evaluated and included in the course mapping document, in addition to removing courses that have been withdrawn.

The documentation of assessment results has been essential in changing the organization's culture from a compliance mentality to one of continuous improvement and effectiveness. The central focus of the assessment of student learning must continue to be to provide evidence for faculty and administration to enhance teaching and student learning.

The assessment process continues to improve based on faculty feedback. As John A. Logan College moves forward in the collection of assessment documentation, presentation, and analysis of results, the Assessment Academy Team will continue to explore efficient options for the management of this information.

APPENDIX

John A Logan College Student Learning Outcomes
FY15 – FY25 Assessment Cycle

SEMESTER	INFORMATION LITERACY	QUANTITATIVE REASONING	CULTURAL AND GLOBAL AWARENESS	COMMUNICATION	CRITICAL THINKING
FALL 2014	COLLECT				
SPRING 2015	COLLECT	PLAN			
FALL 2015	COLLECT	COLLECT			
SPRING 2016	COLLECT	COLLECT	PLAN		
FALL 2016	ANALYZE	COLLECT	COLLECT		
SPRING 2017		COLLECT	COLLECT	PLAN	
FALL 2017		ANALYZE	COLLECT	COLLECT	
SPRING 2018			COLLECT	COLLECT	PLAN
FALL 2018			ANALYZE	COLLECT	COLLECT
SPRING 2019	PLAN			COLLECT	COLLECT
FALL 2019	COLLECT			ANALYZE	COLLECT
SPRING 2020	COLLECT	PLAN			COLLECT
FALL 2020	COLLECT	COLLECT			ANALYZE
SPRING 2021	COLLECT	COLLECT	PLAN		
FALL 2021	ANALYZE	COLLECT	COLLECT		
SPRING 2022		COLLECT	COLLECT	PLAN	
FALL 2022		ANALYZE	COLLECT	COLLECT	
SPRING 2023			COLLECT	COLLECT	PLAN
FALL 2023			ANALYZE	COLLECT	COLLECT
SPRING 2024				COLLECT	COLLECT
FALL 2024				ANALYZE	COLLECT
SPRING 2025					COLLECT

Information Literacy

Definition: The ability to locate, evaluate, retrieve, organize, create, and disseminate information.

OBJECTIVES	EXCELLENT 4	PROFICIENT 3	DEVELOPING 2	BEGINNING 1	NOT EVIDENT 0
Determines the extent of information needed.	The scope of the topic is clearly defined with depth of discovery. Key concepts are effectively supported by a variety of scholarly and/or credible sources.	The scope of the topic is defined but may lack clarity or depth of discovery. Key concepts are effectively supported by some scholarly and/or credible sources.	The scope of the topic is incomplete (parts are missing, too broad or too narrow, etc.). Support for key concepts comes from a few scholarly and/or credible sources.	The scope of the topic is difficult to determine. Support for key concepts comes from sources that are not scholarly and/or credible.	The scope of the topic is not defined. Key concepts are not supported by sources
Integrate relevant information from appropriate sources	Relevant information from the most appropriate sources is communicated, organized, and synthesized to fully achieve a specific purpose, with clarity and depth.	Relevant information from some appropriate sources is communicated, organized, and synthesized. Intended purpose is achieved.	Partially relevant information from limited and/or similar sources is communicated and organized. The information is not yet synthesized, so the intended purpose is not fully achieved.	Irrelevant and/or poor quality source information is communicated. The information is fragmented and/or used inappropriately, so the intended purpose is not achieved.	Source information is not communicated
Use information legally and ethically in appropriate disciplines	All information (ex. Paraphrase, direct quote, indirect quote, block quote, etc.) is cited and formatted correctly. Information is used in ways that are true to original context; there is a distinction between common knowledge and ideas requiring attribution.	Most information (ex. Paraphrase, direct quote, indirect quote, block quote, etc.) is cited and formatted correctly. Information is used in ways that are true to the original context; there is a distinction between common knowledge and ideas requiring attribution.	Some information (ex. Paraphrase, direct quote, indirect quote, block quote, etc.) is cited and formatted correctly. Most information is used in ways that are true to the original context; there is a distinction between common knowledge and ideas requiring attribution.	Very little information (ex. Paraphrase, direct quote, indirect quote, block quote, etc.) is cited and formatted correctly. Information is not used in ways that are true to the original context; there is not a distinction between common knowledge and ideas requiring attribution.	Information (ex. Paraphrase, direct quote, indirect quote, block quote, etc.) is not cited or formatted correctly. Information is not used in ways that are true to the original context; there is not a distinction between common knowledge and ideas requiring attribution.
Cite sources legally and ethically	All sources are correctly cited and formatted in works cited entries using consistent citation style (APA, MLA, Chicago, etc.).	Most sources are correctly cited and formatted in works cited entries using consistent citation style (APA, MLA, Chicago, etc.).	Some sources are correctly cited and formatted in works cited entries using consistent citation style (APA, MLA, Chicago, etc.).	Very few sources are correctly cited and formatted in works cited entries using consistent citation style (APA, MLA, Chicago, etc.).	No sources are correctly cited or formatted in works cited entries. The work has no works cited entry.

Adapted from Association of American Colleges and Universities (AACU) VALUE Rubrics

English Department. Undated Spring 2015

Quantitative Reasoning

Definition: The ability to use and understand numbers to interpret, evaluate, and express information in quantitative terms.

OBJECTIVES	EXCELLENT 4	PROFICIENT 3	DEVELOPING 2	BEGINNING 1	NOT EVIDENT 0
Interpretation Ability to explain mathematical information presented in various forms (equations, graphs, diagrams, tables, words, etc.)	Provides accurate explanations of information presented in mathematical forms. Makes appropriate inferences based on that information.	Provides accurate explanations of information presented in mathematical forms.	Provides somewhat accurate explanations of information presented in mathematical forms but makes some errors.	Attempts to explain information presented in mathematical form, but draws incorrect conclusions about what the information means.	Makes no attempt to explain information presented in mathematical forms.
Organization and Presentation Ability to present relevant information in various mathematical forms (equations, graphs, diagrams, tables, words, etc.)	Skillfully organizes relevant information into an insightful presentation in a way that contributes to a further or deeper understanding.	Competently organizes relevant information into an appropriate and desired presentation.	Completes organization of information, but resulting representation is only partially appropriate or accurate.	Attempt organization of information, but resulting mathematical presentation is inappropriate or inaccurate.	Makes no attempt to organize and present information.
Calculation	Calculations attempted are all successful and sufficiently comprehensive to solve the problem. Calculations are also expertly presented with exceptional detail.	Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem.	Calculations attempted are either unsuccessful or represent only a portion of the calculations required to comprehensively solve the problem.	Calculations are attempted but are both unsuccessful and not comprehensive.	Calculations are not attempted.
Analysis/Synthesis Ability to make and draw conclusions based on quantitative analysis.	Uses the quantitative analysis of data as the basis for deep and thoughtful judgments, drawing insightful, careful qualified conclusions from this work.	Uses the quantitative analysis of data as the basis for competent judgments, drawing reasonable and appropriate qualified conclusions from this work.	Uses the quantitative analysis of data as the basis for tentative, basic judgments, drawing plausible conclusions from this work.	Uses the quantitative analysis of data as the basis for tentative, basic judgments, although is hesitant or uncertain about drawing conclusions from this work.	Does not use quantitative analysis as the basis for judgments.

Cultural and Global Awareness

Definition: The ability to demonstrate an understanding of the influence of culture and society.

OBJECTIVES	EXCELLENT 4	PROFICIENT 3	DEVELOPING 2	BEGINNING 1	NOT EVIDENT 0
Identify and discuss the influence of history, geography, the arts, and/or humanities on individuals and their cultural environment.	Identifies and discusses in detail the influence of one or more topics on individuals.	Identifies and discusses the influence of a topic on individuals, though lacks adequate detail.	Uses an example to briefly discuss how a topic influences individuals.	Only identifies a topic and does not discuss its influence on individuals.	Does not identify or discuss the influence of a subject on individuals.
Identify and discuss the influence of the environment on individuals and their cultural development.	Provides a detailed explanation showing evidence of understanding how the environment influences both individuals and their cultural development.	Identifies and discusses the influence of the environment on individuals and their cultural development, but needs to provide more detail.	Discusses the influence of the environment on individuals or on their cultural development, but not both.	Includes evidence about the influence of the environment either on individuals or their cultural development.	Does not identify or discuss the influence of the environment on individuals or their cultural development.
Differentiation subjective opinions and ideologies based on social and individual bias from objective findings and data.	Discusses examples to explain specific aspects of the culture through objective findings and data.	Explains subjective opinions, but needs to be more specific with evidence from objective findings and data.	Discusses the subjective opinions but without objective findings and data.	Provides almost no evidence to explain subjective opinions and ideologies about culture and society.	Does not discuss subjective opinions and ideologies about culture and society.

JOHN A. LOGAN COLLEGE

LEARNING OUTCOMES REPORT

ASSESSMENT FIVE-STEP PROCESS	
Step 1	**COMPLETE** Part 1 of this document – *Educational Assessment Plan.*
Step 2	**RECORD** student scores on Excel spreadsheet(s).
Step 3	**COMPLETE** Part 2 of this document – *Results, Reflections and Conclusions*.
Step 4	**SUBMIT** the following documentation to Susan May (susanmay@jalc.edu): 1. Excel spreadsheet(s) *2.* Completed Learning Outcomes Report <u>per section</u> *(please retain a copy for future reference)* 3. Two (2) student artifacts <u>per course</u>
Step 5	**REVIEW/ANALYZE** assessment results presented the following semester by Assessment Academy Team.
PART 1 - EDUCATIONAL ASSESSMENT PLAN	

INSTRUCTOR NAME	COURSE (include Prefix, Number, & Section)	SEMESTER

Select Intended Outcome	☐ **INFORMATION LITERACY** ☐ **COMMUNICATION** ☐ **QUANTITATIVE REASONING** ☐ **CRITICAL THINKING** ☐ **CULTURAL & GLOBAL AWARENESS**
Identify and Define Assessment Prompt	*If your prompt is too large for this space, please feel free to attach a separate document.*
Define Criterion for Success	*Sample response: Students will be considered successful if they receive a score of three (3) or higher in each category of the rubric.*

PART 2 – RESULTS, REFLECTIONS AND CONCLUSIONS	
1. State the overall results of your assessment.	
2. Document student strengths identified in this process.	
3. Document student weaknesses identified in this process.	
4. List improvements to be implemented *or* results from improvements implemented as a result of this assessment.	

PLEASE SUBMIT ANY QUESTIONS/SUGGESTIONS REGARDING THIS ASSESSMENT PROCESS.

**Click here to
Submit Electronically**

JOHN A. LOGAN COLLEGE
STUDENT LEARNING OUTCOME AND SEMESTER

SUMMARY OF DATA					
Total Number of Students Assessed	**0**				
Students scoring 3 or 4 in ALL categories	**0**				
4-Excellent	0	0	0	0	
3-Proficient	0	0	0	0	
2-Developing	0	0	0	0	
1-Beginning	0	0	0	0	
0-Evident	0	0	0	0	

Please Note: All student assessment must include a score of 0-4, or one of the following acronyms:
- **W - student has withdrawn**
- **N/A - student not attending**
- **N/C - assignment not completed**

COURSE NUMBER AND SECTION *INSTRUCTOR NAME*						
Student ID	**Student Name**	**Interpretation**	**Organization & Presentation**	**Calculation**	**Analysis/ Synthesis**	
						0
						0
						0
						0
						0
						0
						0
						0
						0
						0

JOHN A. LOGAN COLLEGE

LEARNING OUTCOMES REPORT

ASSESSMENT FIVE-STEP PROCESS	
Step 1	**COMPLETE** Part 1 of this document – *Educational Assessment Plan.*
Step 2	**RECORD** student scores on Excel spreadsheet(s).
Step 3	**COMPLETE** Part 2 of this document – *Results, Reflections and Conclusions*.
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Step 5	**REVIEW/ANALYZE** assessment results presented the following semester by Assessment Academy Team.

PART 1 - EDUCATIONAL ASSESSMENT PLAN		
INSTRUCTOR NAME	**COURSE** (include Prefix, Number, & Section)	**SEMESTER**
Jennifer Jeter	MAT 120 02	FL 16

Select Intended Outcome	☐ **INFORMATION LITERACY**　　　☐ **COMMUNICATION** ☒ **QUANTITATIVE REASONING**　　☐ **CRITICAL THINKING** ☐ **CULTURAL & GLOBAL AWARENESS**
Identify and Define Assessment Prompt	See attachment. *If your prompt is too large for this space, please feel free to attach a separate document.*
Define Criterion for Success	Students will be considered successful if they receive a score of three (3) or higher in each category of the rubric. *Sample response: Students will be considered successful if they receive a score of three (3) or higher in each category of the rubric.*

PART 2 – RESULTS, REFLECTIONS AND CONCLUSIONS	
1. **State the overall results of your assessment.**	Out of 19 students, 9 scored a 3 or higher in all categories and 6 did not score at least a 3 in any category.
2. **Document student strengths identified in this process.**	Most students are doing well with the calculations, as well as choosing the proper way to organize and present the information.
3. **Document student weaknesses identified in this process.**	It appears as though students are struggling the most with interpretation and analysis/synthesis; however, many students left this part completely out of their reports. There are also some struggling with organization & presentation, but the issue here is mainly with consistency among the different ways to organize the data.
4. **List improvements to be implemented _or_ results from improvements implemented as a result of this assessment.**	Spend more time in class covering the interpretation of confidence intervals and hypothesis testing, as well as the need for consistency among tables and graphs when organizing and presenting data.

PLEASE SUBMIT ANY QUESTIONS/SUGGESTIONS REGARDING THIS ASSESSMENT PROCESS.

REDACTED

Click here to Submit Electronically

Project 4 Part 1: Inferential Statistics

Project 4 Part 1 should be typed in a word processing program.

Part 1 is worth 13 points. _You must use proper sentence structure, punctuation, grammar, spelling, etc_. 1 of the 13 points will be awarded based on proper sentence structure, punctuation, spelling, etc.

If you have any questions, please do not hesitate to e-mail me.

Every day we come across statistics in the news, on the web, in articles, etc. Your task is to find **_two_** resources. One that states a **_population proportion_** and one that states a **_population mean_**. These resources should concern on topics of interest to you. This could be something you go out and find or something you just come across and think it is interesting.

After you find your resources, e-mail me your sources (weblinks, scanned articles, etc.). For each source, state the value of the parameter (value of the population proportion or the population mean) and state the population from which the parameter came. Also, state whether **_you_** think (in other words, give **_your_** opinion) the actual value of the parameter is greater than, less than, or just different from the value stated in the article. Provide a rationale for your opinion (how did you come to that conclusion).

Also, write two well-defined survey questions (one for each resource) regarding each of the parameters. These questions will be included in a survey to collect data for Part 2 of the project, which will have you analyze the data collected for your questions. I will compile questions from all students into one survey on StatCrunch that we will then ask friends, family, etc. to complete.

An example of a completed assignment is provided on the next page.

Population Proportion:

Source: The Chronicle of Higher Education, http://chronicle.com/article/Students-Get-Savvier-About/136827/

According to this article, "when students are asked about digital textbooks, they generally express positive sentiments, says Ms. Allen [an advocate for affordable textbooks with the Student Public Interest Research Groups]. But their own preferences conflict with those views. If forced to choose between print and digital, Ms. Allen says, 75 percent of students prefer print. (Mr. Paxhia, pointing to new data from the Book Industry Study Group, notes that the percentage of students who prefer print textbooks declined from 75 percent last fall to 59 percent this fall, a major drop.)"

The claim is the population proportion of all college students who prefer print textbooks to digital textbooks is 0.75. However, based on quick in-class surveys I have done, it seems more than 75% of my students prefer print textbooks to digital textbooks. Therefore, I think the population proportion of students who prefer print textbooks to digital textbooks to be greater than 0.75.

Survey question:

If you are a college student, do you prefer print textbooks or digital textbooks?

Population Mean:

Source: Bureau of Labor Statistics, http://www.bls.gov/tus/charts/students.htm

The article states "on an average weekday, full-time university and college students spent…8.6 hours sleeping... (These data are averages for 2009 to 2013)".
The claim is the population mean hours spent sleeping for all full-time university and college students in America is 8.6 hours. However, based on quick in-class surveys I have done, it seems my students do not get this much sleep at night. Therefore, I think on the average weekday, full-time university and college students spend less than 8.6 hours sleeping.

Survey question:

If you are a full-time university or college student in America, how many hours of sleep do you get a night?

Project 4 Part 2: Inferential Statistics

Your report should be typed in a word processing program with all tables and graphs inserted into the document at the appropriate spot. Feel free to organize the report in any manner you see fit.

This report is worth 75 points. _You must use proper sentence structure, punctuation, grammar, spelling, etc_.
5 of the 75 points will be awarded based on proper sentence structure, punctuation, spelling, etc.

If you have any questions, please do not hesitate to e-mail me.

To copy and paste a table into Word, click anywhere in the output screen (in the table). Press **Ctrl + a** to select the entire table and then **Ctrl + c** to copy the table. Paste the table into the Word document by pressing **Ctrl + V**.

To copy and paste a graph into Word, click **Options**, **Copy**, right-click on the image that pops up and choose **Copy Image**. Paste the image into the Word document by pressing **Alt** + **Ctrl** + **v** and paste as a **Device Independent Bitmap**.

Access the MAT 120 FL16 Survey Responses data set in StatCrunch. Using the data collected for the questions you wrote in Project 4 Part 1, write a report which includes all of the following items.

Note: At the end of each question is a set of parenthesis. The number inside indicates the section of the text you may reference to review the content for the indicated question.

Proportion Analysis:

- Construct a frequency and relative frequency distribution for your data. (2.1)
- Construct a frequency bar graph and a relative frequency bar graph for your data. (2.1)
- Construct a pie chart for your data. (2.1)
- Compute the sample proportion for your data. (8.2)
- Construct a 90%, 95%, and 99% confidence interval for the population proportion. Interpret each interval. (9.1)
- Using your source from the first assignment:
    - (a) Write a set of hypotheses representing the source's claimed value of the population proportion and how you thought the actual value would compare. (10.1)
    - (b) Describe the sampling distribution of the sample proportion, assuming the source's claim is true. (8.2) Recall: To describe a distribution, identify the shape, mean, and standard deviation.
    - (c) Conduct the appropriate hypothesis test at the $\alpha=0.05$ level of significance. Make sure to follow the 5-step process outlined in the lecture notes. Would the conclusion of your hypothesis change if $\alpha=0.01$? (10.2)

Mean Analysis:

- Construct a frequency and relative frequency distribution for your data. (2.2)
  Recall: If the data are discrete, but with many different values of the variable or if the data are continuous, then the categories of data, called classes, must be created using intervals of numbers.
- Construct a frequency histogram and relative frequency histogram for your data. (2.2)
  Describe the shape of the distribution.
- Compute the sample mean and the sample standard deviation for your data. (3.1)
- Construct a boxplot for your data. Does your data set have any outliers? If so, what are the outliers?
  Calculate the upper and lower fences to justify your answer. (3.5)
- Construct a 90%, 95%, and 99% confidence intervals for the population mean. Interpret each interval. (9.2)
- Using your source from the first assignment:
  - (a) Write a set of hypotheses representing the source's claimed value of the population mean and how you thought the actual value would compare. (10.1)
  - (b) Describe the sampling distribution of the sample mean, assuming the source's claim is true. (8.1 & 9.2)
    Recall: To describe a distribution, identify the shape, mean, and standard deviation.
  - (c) Conduct the appropriate hypothesis test at the $\alpha=0.05$ level of significance. Make sure to follow the 5 step process outlined in the lecture notes. Would the conclusion of your hypothesis change if $\alpha=0.01$? (10.3)

JOHN A. LOGAN COLLEGE
STUDENT LEARNING OUTCOME AND SEMESTER

SUMMARY OF DATA					
Total Number of Students Assessed	19				
Students scoring 3 or 4 in ALL categories	9				
4-Excellent	3	5	3	3	
3-Proficient	9	8	6	7	
2-Developing	1	4	8	2	
1-Beginning	4	2	2	6	
0-Evident	2	0	0	1	

Please Note: All student assessment must include a score of 0-4, or one of the following acronyms:
   - **W - student has withdrawn**
   - **N/A - student not attending**
   - **N/C - assignment not completed**

COURSE NUMBER AND SECTION INSTRUCTOR NAME					
Student ID	Student Name	Interpretation	Organization & Presentation	Calculation	Analysis/ Synthesis	
		3	3	2	3	3
		0	2	2	0	0
		3	4	3	3	4
		0	1	2	1	0
		3	4	2	2	2
		3	4	3	3	4
		1	1	1	1	0
		W	W	W	W	0
		3	3	3	3	4
		3	3	4	3	4
		1	2	2	1	0
		1	2	2	1	0
		4	4	4	4	4
		2	2	1	1	0
		3	3	3	3	4
		4	3	3	4	4
		3	4	2	2	2
		4	3	4	4	4
		3	3	3	3	4
		1	3	2	1	1