Appendix E
Guided Discovery Project Assignments

Guided Linear Regression Project Assignments

Mastery Goals and Student Learning

A Linear Regression Investigation Discipline: Education

Overview

Research suggests that students learn better when they have a true desire to understand, rather than just a desire to appear capable to teachers and peers. Desires such as these have been classified as *Achievement Goals* (see reference [2] below). Students who want to understand the subject they are studying are said to have strong *mastery goals*, whereas students who want to appear capable are said to have strong *performance goals*. Since these goals are not mutually exclusive, it is possible to have strong mastery goals and strong performance goals. However, many researchers propose that stronger mastery goals are associated with better academic achievement. You can design a statistical study to examine this relationship for yourself.

A Project Idea

Examine the correlation between mastery goals and student achievement in one of your classes. Use linear regression to determine how well student achievement can be predicted by mastery goals. A 5-question instrument designed to measure student mastery goals is shown on the next page, along with instructions for computing a mastery goals score (source: reference [1] below).

Plan Your Study

Choose a Setting

Choose a particular course (e.g., Chemistry 101) with enough students enrolled to obtain participants for the study. This may be a course which is currently in progress or a recently ended course, where students who took the course are still available to participate.

Define the Variables

1) Mastery Goals: This variable can be represented numerically by the mastery goal score computed from the mastery goal survey given on the next page.
2) Achievement: This variable may be represented in a number of ways; it could be the score on a particular test or exam; the student's final grade, represented on the 4-point grade scale (i.e., A=4, B=3,…, F=0); or some other evaluation of the student's learning. Examine your options and decide how best to represent student achievement in the setting you have selected. You will most likely rely on self-reported data (participating students will tell you the score or grade of interest).

References

[1] Elliott, A., McGregor, H., & Gable, S. (1999). Achievement goals, study strategies, and exam performance: A mediational analysis. *Journal of Educational Psychology*, 91, 549-563.

[2] Pintrich, P. R., & Schunk, D. H. (1996). *Motivation in education: Theory, research, and applications*. Englewood Cliffs, NJ: Prentice Hall.

Mastery Goals Instrument

This instrument should be adapted to be consistent with the course subject; in this sample instrument, the subject is chemistry. Participants should answer each question using a Likert type scale (e.g., on a scale of 1 to 6, where 1=strongly disagree and 6=strongly agree). Your scale may have a greater range (e.g., 8 instead of 6); a guideline is at least 4 and at most 10. The mastery goals score is the average (mean) of all the responses.

I like chemistry assignments that I can learn from, even if I make a lot of mistakes.
1 2 3 4 5 6
An important reason to do my chemistry assignments is that I like to learn new things.
1 2 3 4 5 6
I like chemistry assignments that really make me think.
1 2 3 4 5 6
I do my chemistry assignments because I want to become better at chemistry.
1 2 3 4 5 6
I do my chemistry assignments because I am interested in them.
1 2 3 4 5 6

Design Notes

Record the details of your project here, along with relevant notes about your decisions. Note why you made the decisions you did and what effect these decisions have on your project. These considerations should be noted in your project report.

Hypothesis (Do you expect a correlation? What direction? Weak or strong?)	
Setting (What course? In progress or ended?)	
Target sample size	
Sampling strategy	
Data collection strategy How you will modify above instrument Other survey design considerations	
Steps you will take to avoid bias	
Other design considerations	

Self-Esteem and Depression

A Linear Regression Investigation — Discipline: Psychology

Overview

Self-esteem refers to a person's overall evaluation of his or her own worth. A person with low self-esteem may have negative thoughts and emotions that could lead to anxiety and depression. A number of studies (such as reference [2] below) have investigated the relationship between these variables. In this project, you will design a statistical study to examine the relationship between self-esteem and anxiety for yourself.

A Project Idea

Examine the correlation between a person's reported self-esteem and score on the anxiety section of the $DASS_{21}$ survey instrument [3]. Use linear regression to determine how well depression can be predicted by self-esteem. A 10-item instrument from the International Personality Item Pool designed to measure self-esteem [1] and the 7 items from the $DASS_{21}$ survey pertaining to anxiety are shown on the following pages, along with instructions for scoring each construct.

Plan Your Study

Choose a Target Sample

You will need to administer a survey with the self-esteem and anxiety constructs to obtain data for the study. First, decide on a target population. For example, are you interested in a population as general as everyone in your community, or are you interested in a specific population such as students at your school? Once you decide on the population of interest, formulate a plan to obtain a sample of participants to complete your survey.

Define the Variables

1) Self-Esteem: This variable can be represented numerically by the composite score computed from the self-esteem survey given on the next page.
2) Anxiety: This variable can be represented numerically by the composite score computed from the 7 $DASS_{21}$ survey items given on the next page.

References

[1] Goldberg, L. R., Johnson, J. A., Eber, H. W., Hogan, R., Ashton, M. C., Cloninger, C. R., & Gough, H. C. (2006). The International Personality Item Pool and the future of public-domain personality measures. *Journal of Research in Personality, 40*, 84-96. Items available at http://ipip.ori.org/

[2] Kernis, M. H., Grannemann, B. D., & Mathis, L. C. (1991). Stability of self-esteem as a moderator of the relation between level of self-esteem and depression. *Journal of Personality and Social Psychology*, *61*(1), 80-84.

[3] Lovibond, S.H. & Lovibond, P.F. (1995). *Manual for the Depression Anxiety Stress Scales*. (2nd. Ed.) Sydney: Psychology Foundation. Survey available at http://www2.psy.unsw.edu.au/groups/dass/

Self-Esteem Instrument

Below is the 10 item self-efficacy scale from the International Personality Item Pool. Participants should answer each question using the following scale:

1 = very inaccurate, 2 = moderately inaccurate, 3 = neither inaccurate nor accurate, 4 = moderately accurate, 5 = accurate

The first 5 items should be positively coded with the number reported. The last 5 items represent negative comments about self-esteem and should be reversed coded as follows:

1 →5, 2→4, 3→3, 4→2, 5→1

The composite self-esteem score is the sum of the first 5 responses and the 5 reverse coded responses. Higher scores indicate higher levels of self esteem.

I feel comfortable with myself.
1 2 3 4 5

I just know that I will be a success.
1 2 3 4 5

I seldom feel blue.
1 2 3 4 5

I like to take responsibility for making decisions.
1 2 3 4 5

I know my strengths.
1 2 3 4 5

I dislike myself.
1 2 3 4 5

I am less capable than most people.
1 2 3 4 5

I feel that my life lacks direction.
1 2 3 4 5

I question my ability to do my work properly.
1 2 3 4 5

I feel that I'm unable to deal with things.
1 2 3 4 5

Anxiety Instrument

Below is the 7 item anxiety scale from the $DASS_{21}$ survey. Participants should answer each question to ***describe their experience over the last week***, using the following scale:

0 = Did not apply to me at all
1 = Applied to me to some degree, or some of the time
2 = Applied to me to a considerable degree, or a good part of the time
3 = Applied to me very much, or most of the time

I was aware of dryness of my mouth.
0 1 2 3
I experienced breathing difficulty (eg, excessive rapid breathing, breathlessness in the absence of physical exertion).
0 1 2 3
I experienced trembling (eg, in the hands).
0 1 2 3
I was worried about situations in which I might panic and make a fool of myself.
0 1 2 3
I felt I was close to panic.
0 1 2 3
I was aware of the action of my heart in absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat).
0 1 2 3
I felt scared without any good reason.
0 1 2 3

Design Notes

Record the details of your project here, along with relevant notes about your decisions. Note why you made the decisions you did and what effect these decisions have on your project. These considerations should be noted in your project report.

Hypothesis (Do you expect a correlation? What direction? Weak or strong?)	
Target sample size	
Sampling strategy	
Data collection strategy How you will modify above instrument Other survey design considerations	
Steps you will take to avoid bias	
Other design considerations	

Educational Attainment and Per Capita Income

A Linear Regression Investigation — Discipline: Economics

Overview and Project Idea

It is widely reported that higher levels of education lead to more job opportunities and higher earning power for an individual. For example, a report from the U. S. Census Bureau (see reference [1] below) reports on the average annual earnings of workers in the U. S. between the ages of 25 and 64. For full-time, year-round workers, those who had not graduated from high school earned on average $23,400 per year, while a high school graduate with no college experience earned $30,400 per year. Those whose highest level of educational attainment was a bachelor's degree earned $52,200 per year, and the average incomes in the report increase with more education. Does this relationship hold if we examine entire towns or cities instead of individuals? In this project, you will investigate this question by collecting data from the internet and examining the correlation between a city's percentage of individuals attaining at least a Bachelor's degree and the location's estimated per capita income.

Plan Your Study

Choose a Sample

The web site City-Data.com (http://www.city-data.com) contains a wealth of data for U. S. cities and towns. Use this web site to select 30 cities or towns for your investigation. For an entire city or town, there are a number of factors that can affect the per capita income such as the types of companies and businesses present in the nearby area. Therefore, you should try to select 30 cities that are relatively similar. For instance, you could select only large U. S. cities (Atlanta, New York, Los Angeles, etc.), or you could select only small towns (less than 6,000 people) in a specific state. How you select your cities is an important part of the project that should be addressed in your report.

Define the Variables

1) Percent Bachelor's Degree or Higher: For each city or town, City-Data.com provides a figure labeled "Educational Attainment %." This figure shows a bar graph with the percentage of individuals with each highest level of educational attainment. For example, the bachelor's degree category gives the percentage of individuals in the town or city with a bachelor's degree but no higher level of education. For this project, you want the percentage of individuals with at least a bachelor's degree. For this number, you will have to ***add*** the percentages for the highest levels of education being a bachelor's degree, master's degree, professional school degree, and doctorate degree. Note that the figure is interactive, and the numerical percentage appears when a user places the cursor over a bar on the graph.
2) Per Capita Income: For each city or town, City-Data.com provides the estimated per capita income (average income per person).

References

[1] Cheeseman Day, J., & Newburger, E. C. (2002). The big payoff: Educational attainment and synthetic estimates of work-life earnings. Report P23-210. Washington, DC: U.S. Department of Commerce Economics and Statistics Administration, U.S. Census Bureau.

Design Notes

Record the details of your project here, along with relevant notes about your decisions. Note why you made the decisions you did and what effect these decisions have on your project. These considerations should be noted in your project report.

Hypothesis (Do you expect a correlation? What direction? Weak or strong?)	
Target sample size	30
Sampling strategy	
Steps you will take to avoid bias	
Other design considerations	

Major Earthquakes per Year

A Linear Regression Investigation Discipline: Science/Geology

Overview and Project Idea

It seems that each year more and more natural disasters are being reported on the news. Perhaps the perception that there are more earthquakes occurring per year than in the past is just a result of the media coverage. In this project, you will explore the geological data and test for yourself the hypothesis that the number of major earthquakes is increasing per year. Using the United States Geological Survey (USGS) web site, you will collect data on the number of major earthquakes occurring around the world over the past two decades and investigate the pattern over time.

Plan Your Study

Collecting Data

The web site http://earthquake.usgs.gov/ contains pages listing the number of earthquakes per year worldwide and in the United States. Reference [1] below contains tables with data for 1990 through 1999, and reference [2] contains data for 2000 to the present. If these links become broken or do not work for you, an internet search for "number of earthquakes per year" should likely lead to similar data. Using these data, you will define the variables described below and explore the correlation to see if the number of major earthquakes reported worldwide is increasing significantly over time.

Define the Variables

1) Major Earthquakes per Year: For this investigation, you will only focus on earthquakes with a magnitude of 5.0 or higher on the Richter scale. The USGS site provides the numbers of earthquakes per year in 1 point increments (e.g., 5.0-5.9). So you will have to sum the data for each year to get the total number of earthquakes measuring 5.0 or higher.
2) Time (years): Using the year as second variable, the correlation statistic will provide information about the number of major earthquakes over time.

References

[1] U. S. Geological Survey (2011). *Earthquake Information for the 1990s.* Available at http://earthquake.usgs.gov/earthquakes/eqarchives/year/info_1990s.php

[2] U. S. Geological Survey (2011). *Earthquake Facts and Statistics.* Available at http://earthquake.usgs.gov/earthquakes/eqarchives/year/eqstats.php

Design Notes

Record the details of your project here, along with relevant notes about your decisions. Note why you made the decisions you did and what effect these decisions have on your project. These considerations should be noted in your project report.

Hypothesis (Do you expect a correlation? What direction? Weak or strong?)	
Target sample size	
Sampling strategy	
Steps you will take to avoid bias	
Other design considerations	

Guided Comparison Project Assignments

Conducting a Taste Test

A t-Test Investigation Discipline: Business (Marketing)

Overview

A popular marketing technique in the food industry is to report the results of a taste test. Taste tests have been conducted for colas, coffee, peanut butter, and a number of other products. One way to conduct a taste test is to have tasters rate the taste of the product they sample (e.g., on a scale of 1 to 10). If a taste test compares two specific brands (e.g., Pepsi and Coke) the marketing representative hopes to report not only that the average rating of her product is higher, but that the difference in ratings is statistically significant. You can design a statistical study to conduct a taste test and analyze its results.

A Project Idea

Conduct a taste test for two different brands of the same food or drink item. Use the appropriate t-test to analyze the results and determine if there is a significant difference in taster preference.

Plan Your Study

Choose a Product

Choose two brands of a particular food or drink item. Practically speaking, keep in mind that you will provide samples of this food item to participants in your study. Therefore, the study will be more manageable if this item is easy to transport, easy to serve, and not too expensive. Also keep in mind that your participants should not know what brand they are tasting, so you will need to serve it from an unmarked container. We will refer to your two brands as brand A and brand B.

Define the Variable

Taste Rating: This variable can be represented numerically by the score that the taster gives to the product (s)he tastes. The product can be rated on a scale of 1 to 10.

Choose a Design

Option 1: Conduct a two-sample t-test with two independent groups by randomly assigning each participant to one of two groups. One group will taste brand A and the other group will taste brand B. Run the two-sample t-test using the rankings for each brand.

Option 2: Conduct a one-sample t-test with matched pairs. Each participant will taste both brands. The order in which each participant tastes the two brands must be randomized (i.e., not all participants should taste brand A first, as this could introduce bias). One way to randomize order of tasting is to flip a coin. Compute the difference in rankings by subtracting the two rankings, taking care that all differences are computed the same way (e.g., always use brand A rank – brand B rank).

Design Notes

Record the details of your project here, along with relevant notes about your decisions. Note why you made the decisions you did and what effect these decisions have on your project. These considerations should be noted in your project report.

Design (Two sample or matched pairs? One or two sided?)	
Hypothesis (State null and alternative hypotheses mathematically and explain in words; explain reasoning behind hypothesis)	
Target sample size (Note also how this affects requirements for normality)	
Plan to verify assumption of normality (Note how strict this assumption is, based on sample size above)	
Sampling strategy	
Demographic data you will collect	
Data collection strategy (Where and how will you conduct taste test?)	
Steps you will take to avoid bias	
Other design considerations	

Gender and Attitudes about Mathematics Instruction

A t-Test Investigation — Discipline: Education

Overview

In 1977, Fennema and Sherman [1] published a study of gender differences in mathematics. While they found few cognitive differences, they did find that females tended to have less favorable attitudes toward mathematics than males. Since that time, there have been major efforts made to increase the number of females taking advanced mathematics and science courses and pursuing careers in those fields. In this project, you will conduct your own investigation to compare the attitudes of males and females about Mathematics Instruction.

A Project Idea

Conduct a survey to assess the attitudes about mathematics instruction of males and females. Use an independent samples t-test to analyze the results and determine if there is a significant difference in attitudes.

Plan Your Study

Define the Variable

Attitudes about Mathematics: Many mathematics attitudes scales have been published including Fennema and Sherman's. You may decide to search the internet for another scale, but one has been provided on the following page. This survey was used in a study of the Science Work Experience Programs for Teachers (SWEPT) evaluations (see [2]). Reverse code items c, d, k, l, m, n, and o (1→5, 2→4, 3→3, 4→2, 5→1). Then sum these reverse coded numerical responses along with the original numerical responses to the other items to obtain a composite score for attitudes about mathematics. Higher scores indicate a more positive attitude.

Design

Administer the survey to a sample of males and females using gender to establish two independent groups. Run the two-sample t-test using the composite attitude scores for each gender.

References

[1] Fennema, E., & Sherman, J. (1977). Sex-related differences in mathematics achievement, spatial visualization, and affective factors. *American Educational Research Journal, 14,* 51–71.

[2] Science Work Experience Programs for Teachers (n.d.). Retrieved from http://www.sweptstudy.org/

Attitudes about Mathematics Instruction Survey

To what extent do you agree or disagree with each of the following statements about mathematics? *(Circle one number on each line.)*

	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
a. I enjoy mathematics	1	2	3	4	5
b. Mathematics is useful in everyday life	1	2	3	4	5
c. Mathematicians often don't have very good social skills	1	2	3	4	5
d. Doing mathematics often makes me feel nervous or upset	1	2	3	4	5
e. Mathematics challenges me to use my mind	1	2	3	4	5
f. The mathematics instruction that I have received will be helpful for me in the future	1	2	3	4	5
g. Mathematicians usually work with colleagues as part of a team	1	2	3	4	5
h. I am good at mathematics	1	2	3	4	5
i. Advancements in mathematics and science are largely responsible for the standard of living in the United States	1	2	3	4	5
j. I usually understand what we are doing in mathematics class	1	2	3	4	5
k. Knowing mathematics really doesn't help get a job	1	2	3	4	5
l. Mathematics is difficult for me	1	2	3	4	5
m. Working as a mathematician sounds pretty lonely to me	1	2	3	4	5
n. Studying hard in mathematics is not cool to do	1	2	3	4	5
o. Even without a strong background in mathematics, I will probably end up with the kind of job that I want	1	2	3	4	5
p. Overall, mathematics and science have cause more good than harm in our lives	1	2	3	4	5
q. I will probably take more advanced math courses available to me at this school	1	2	3	4	5

Design Notes

Record the details of your project here, along with relevant notes about your decisions. Note why you made the decisions you did and what effect these decisions have on your project. These considerations should be noted in your project report.

Hypothesis (State null and alternative hypotheses mathematically and explain in words; explain reasoning behind hypothesis)	
Target sample size (Note also how this affects requirements for normality)	
Plan to verify assumption of normality (Note how strict this assumption is, based on sample size above)	
Sampling strategy	
Demographic data you will collect	
Data collection strategy (Where and how will you conduct survey?)	
Steps you will take to avoid bias	
Other design considerations	

Major and Introversion Level

A t-Test Investigation Discipline: Education/Psychology

Overview

Some people are more outgoing than others. Psychologists use the term extrovert to refer to a person who is energized by being around people, and they use the term introvert to refer an individual who is energized by being alone. Are introverts or extroverts drawn to particular majors and career choices? For example, many people tend to think of mathematicians as introverts working quietly in their offices. Is this true in general? In this project, you will either compare participants from two different majors to see if one group exhibits higher levels of introversion, or you can compare one major to a general sample.

A Project Idea

Conduct a survey to assess the level of introversion among two different majors or one major and a general sample of students. Use an independent samples t-test to analyze the results and determine if there is a significant difference in attitudes.

Plan Your Study

Define the Variable

Introversion: The International Personality Item Pool [1] provides a brief survey to measure an individual's level of introversion. This instrument is shown on the next page. Reverse code items 5 through 10 (1→5, 2→4, 3→3, 4→2, 5→1). Then sum these reverse coded numerical responses along with the original numerical responses to the other items to obtain a composite introversion score. Higher scores indicate a higher level of introversion.

Choose a Design

Option 1: Select two majors and administer the survey to a sample of students from each group. Run a two-sample t-test using the introversion scores for each major.

Option 2: Select a particular major (Math , History, etc.). Administer the survey to a sample of students with this major and a sample of students with other majors. This will form two groups, the majors and non-majors (such as math majors and students not majoring in math). Run a two-sample t-test using the introversion scores for the majors and non majors.

Option 3: A one-sample t-test investigation can be used with a single group of majors, if you decide on a score that would indicate a high level of introversion. The scale has a maximum score of 50 points, so you might decide that a 30 (or some other score) or above indicates a high level of introversion. Then you could test the hypothesis that the students majoring in the area you selected will have a mean score above 30 using a one-sample t-test.

References

[1] International Personality Item Pool: A Scientific Collaboratory for the Development of Advanced Measures of Personality Traits and Other Individual Differences (http://ipip.ori.org/). Internet Web Site.

IPIP Introversion Scale

To what extent do you agree or disagree with each of the following statements?

	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1. I don't like to draw attention to myself.	1	2	3	4	5
2. I keep in the background.	1	2	3	4	5
3. I dislike being the center of attention.	1	2	3	4	5
4. I don't talk a lot.	1	2	3	4	5
5. I don't mind being the center of attention.	1	2	3	4	5
6. I take charge.	1	2	3	4	5
7. I want to be in charge.	1	2	3	4	5
8. I am the life of the party.	1	2	3	4	5
9. I can talk others into doing things.	1	2	3	4	5
10. I seek to influence others.	1	2	3	4	5

Notes: For convenience, the items have been listed so that the first 4 are positive (agreeing indicates an introversion tendency) and the last 6 are negative (disagreeing indicates an introversion tendency). You may want to scramble the order of the questions before administering the survey. Also, note that this scale simultaneously measures introversion and extroversion tendencies. If you prefer to frame your hypothesis and questions in terms of extroversion, you can swap the coding or look for lower scores.

Design Notes

Record the details of your project here, along with relevant notes about your decisions. Note why you made the decisions you did and what effect these decisions have on your project. These considerations should be noted in your project report.

Design (One sample or two? One or two sided?)	
Hypothesis (State null and alternative hypotheses mathematically and explain in words; explain reasoning behind hypothesis)	
Target sample size (Note also how this affects requirements for normality)	
Plan to verify assumption of normality (Note how strict this assumption is, based on sample size above)	
Sampling strategy	
Demographic data you will collect	
Data collection strategy (Where and how will you conduct survey?)	
Steps you will take to avoid bias	
Other design considerations	

Political Party and Openness to Experience

A t-Test Investigation Discipline: Political Science/Psychology

Overview

Many people hold stereotypical views of the two major U. S. political parties. Perhaps a conservative Republican is set in his or her ways and may be less open to new experiences than a more liberal Democrat. Of course, that may just be a stereotype that does not hold up in real life. In this project, you can investigate for yourself to determine which political party members display a higher level of openness to experience.

A Project Idea

Conduct a survey to assess the level of openness to experience among Democrats and Republicans. Use an independent samples t-test to analyze the results and determine if there is a significant difference between the two parties. (Note: Instead of political parties, you could separate groups by some other dichotomous variable such as underclassmen and upperclassman.)

Plan Your Study

Define the Variable

Openness to Experience: The International Personality Item Pool [1] provides a scale to measure an individual's level of openness to experience. A 10 item version of the construct is contained on the next page, and the IPIP website also contains a 20 item version. For the 10 item version, reverse code items 6 through 10 (1→5, 2→4, 3→3, 4→2, 5→1). Then sum these reverse coded numerical responses along with the original numerical responses to the other items to obtain a composite introversion score. Higher scores indicate a higher level of openness to experience.

Choose a Design

Option 1: Administer the survey to a sample of people who claim to be Democrats and a sample who claim to be Republicans. Run a two-sample t-test using the openness to experience scores for each party.

Option 2: A one-sample t-test investigation can be used with a single group (Democrats or Republicans), if you decide on a score that would indicate a high level of openness to experience. The 10 item scale has a maximum score of 50 points, so you might decide that a 30 (or some other score) or above indicates a high level of openness to experience. Then you could test the hypothesis that members of a particular political party will have a mean score above 30 using a one-sample t-test.

References

[1] International Personality Item Pool: A Scientific Collaboratory for the Development of Advanced Measures of Personality Traits and Other Individual Differences (http://ipip.ori.org/). Internet Web Site.

IPIP Openness to Experience Scale

To what extent do you agree or disagree with each of the following statements?

	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1. I believe in the importance of art.	1	2	3	4	5
2. I have a vivid imagination.	1	2	3	4	5
3. I tend to vote for liberal political candidates.	1	2	3	4	5
4. I carry the conversation to a higher level.	1	2	3	4	5
5. I enjoy hearing new ideas.	1	2	3	4	5
6. I am not interested in abstract ideas.	1	2	3	4	5
7. I do not like art.	1	2	3	4	5
8. I avoid philosophical discussions.	1	2	3	4	5
9. I do not enjoy going to art museums.	1	2	3	4	5
10. I tend to vote for conservative political candidates.	1	2	3	4	5

Notes: For convenience, the items have been listed so that the first 5 are positive (agreeing indicates openness to experience) and the last 5 are negative (disagreeing indicates openness to experience). You may want to scramble the order of the questions before administering the survey.

Design Notes

Record the details of your project here, along with relevant notes about your decisions. Note why you made the decisions you did and what effect these decisions have on your project. These considerations should be noted in your project report.

Design (One sample or two? One or two sided?)	
Hypothesis (State null and alternative hypotheses mathematically and explain in words; explain reasoning behind hypothesis)	
Target sample size (Note also how this affects requirements for normality)	
Plan to verify assumption of normality (Note how strict this assumption is, based on sample size above)	
Sampling strategy	
Demographic data you will collect	
Data collection strategy (Where and how will you conduct survey?)	
Steps you will take to avoid bias	
Other design considerations	