

Stat 296 Fall 2007
Partial Solutions to Assignment #1

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/*=====
Stat 296 - Assignment 1 Solutions for Exercises 1 and 2 of Chapter 1 of Higgins
=====*/

options ls=80 ps=256 formdlim='*';

/* Question 1 Binomial Test of median exam score > 70 */

title1 'Stat 296';
title2 'Question 1';

data scores;
  infile '/u2/stat296/ex1_01.txt' firstobs=2;
  input exam;
  if exam > 70 then count=1;
  else if exam <= 70 then count=0;
run;

proc freq data=scores;
  tables count/binomial;
run;

/* Question 2a) and b) 90% C.I. of median and 75th Percentile */

title2 'Questions 2a) and 2b)';

proc univariate data=scores mu0=70 cipctldf alpa=0.1;
  var exam;
run;

/* Question 2c) 90% C.I. of the cdf (Not Covered in the Lab Manual)*/

title2 'Questions 2c)';

data scores;

  infile '/u2/stat296/ex1_01.txt' firstobs=2;
  input exam;
  if exam <= 80 then X=1;
  else if exam > 80 then X=0;
run;

* The following step counts the number of 1's in X and the total number;
* of observations;

proc freq data=scores;
  tables X;
run;
```

(continued)

* The probit function used below for calculations is described in the;
* Stat 257 lab manual;

```
data compute;  
  x = 28; *Number of observations with exam <= 80;  
  n = 40; * total number of observations;  
  p = x/n;  
  alpha=0.1;  
  sd = sqrt(p*(1-p)/n);  
  lower_CI = p - probit(1-(alpha/2))*sd;  
  upper_CI = p + probit(1-(alpha/2))*sd;  
run;
```

```
proc print data=compute;  
run;
```

Exercises 1, 2, 5, 7 of Chapter 1 of Higgins: These were discussed in class on Thursday, September 20, 2007.

Exercise 4 of Chapter 1 of Higgins: Recall that Type I and Type II errors are defined as in the following table.

	Accept H_0	Reject H_0
H_0 true	correct decision	Type I error
H_A true	Type II error	correct decision

If, regardless of the data, we ALWAYS reject H_0 , then even if H_0 is true we will still reject it. Thus, whenever H_0 is actually true, we will always make an error, and so $P\{\text{Type I error}\}=1$. Since we will always reject H_0 , then whenever H_A is actually true, we will make the correct decision. Hence, $P\{\text{Type II error}\}=0$, and so power= 1.