Midterm Examination for SOSC-2500-01, BQMSS, 2021 Winter.

Instructor:	A.G. Phipps.

INSTRUCTIONS — PLEASE READ THESE FIRST.

Time for this exam is two (02) hours.

Please answer all six (06) questions.

Each question counts equally for marks.

The maximum word count for each of six questions is 300 words. The maximum word count for the total exam is therefore 1,800 words. No exceptions to these word counts.

Write in sentences and not in point form.

Word counts do not apply to images or screen captures of diagrams and drawings included in the Word document or pdf. Photographed diagrams and drawings will be legible.

Credit will only be given to answers that have the appropriate legible calculations and written interpretation, where the latter refers to an explanation of what is being done or looked at. Try not to overreact to small differences between numbers.

At or before 6 p.m. on February 23, the completed answers to the exam will be submitted to the student's assistant in a Word document or pdf as an electronic attachment in a message from student's official UWin email account, and not in the body of the message.

Email addresses of assistants ordered by lab session are: #51, Melody <salehi11@uwindsor.ca>; #52, Kat <saathof@uwindsor.ca>; #53, Vanessa <bumanlav@uwindsor.ca>; #54, Madison <jamie114@uwindsor.ca>; #55, Hailey <pawsey@uwindsor.ca>; #56, Brianna <grandib@uwindsor.ca>; #57, Aurora <huang15z@uwindsor.ca>; #58, Nour <yassinen@uwindsor.ca>; and #59, Noelle <lefrancn@uwindsor.ca>.

This email message with attached Word document or pdf will have the subject line of "BQM Midterm Exam Lecture Section 1", and it will include in the body of the message the sentences that, "I [your name] am submitting my completed midterm exam in BQM 2021 Winter Lecture Section 1 at [what time] on [what day]. I verify that my answers to the exam are my own original work." The submission of answers from the official UWin email account will serve as a signature of these two sentences.

A request for a read receipt for the message sent from an official UWin email account is recommended to verify transmission and receipt of emailed exam answers.

Make sure your name is on first page of the attached Word document or pdf.

First Lecture Section's Midterm Exam Background.

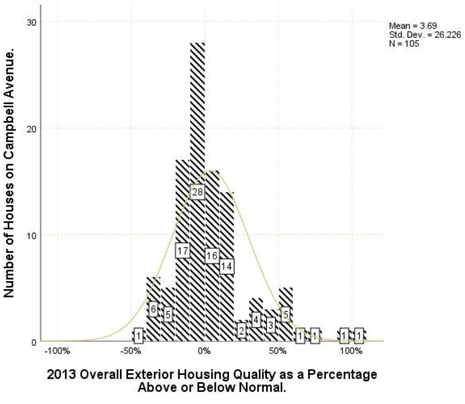
The six questions refer to statistics and histograms describing the Overall Exterior Quality of houses in the University Neighbourhood in 2006 or 2013.

Note in addition the questions refer to houses on a particular street in the University Neighbourhood, named Campbell Avenue, whose exterior housing quality data will be further analyzed later in the course. Houses on Campbell Avenue are farthest from the University of Windsor campus.

An example house on Campbell Avenue is 262 Campbell Avenue. It has an overall exterior housing quality of 42% and 'new' shingles in 2013.

First Lecture Section's Questions.

(1)



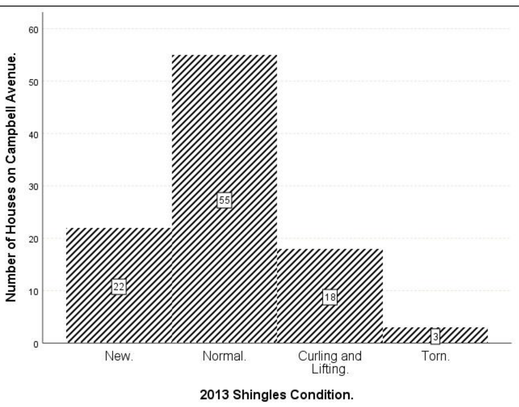
Statistics.		Campbell Avenue Houses' *pHQ2013* Overall Exterior Housing Quality Percentages in 2013.
N.	Valid.	105
Mean.		3.69%
Median.		(-1.7)%
Std. Deviation.		26.2%
Skewness.		1.3
Kurtosis.		2.35
Minimum.		(-49)%
Maximum.		100%

(1.1) Use the above histogram to explain the by-hand calculation of the probability of a Campbell Avenue house having a *pHQ2013* overall exterior housing quality that is less than the mean of all Campbell Avenue houses' *pHQ2013s* in 2013. That is, explain the calculation of the probability of an avenue house having a *pHQ2013* that is greater than or equal to (-100)% and less than 3.69%. (1.2) Interpret this probability to infer the relative overall exterior quality of Campbell Avenue houses in 2013, especially (1.3) in comparison with the expected probability for the range of interest if Campbell Avenue houses' *pHQ2013s* have a normal distribution.

(2) If 262 Campbell Avenue has a *pHQ2013* overall exterior housing quality of 42%, then (2.1) compare its *pHQ2013* with the mean of all Campbell Avenue houses' *pHQ2013s* in 2013. (2.2) Proceed to explain the by-hand calculation of the the probability of a house having a *pHQ2013* overall exterior housing quality between this mean of all Campbell Avenue houses' *pHQ2013s* and 262 Campbell Avenue's *pHQ2013*. That is, explain the calculation of the probability of an avenue house having a *pHQ2013* that is greater than or equal to 3.69% and less than 42%. (2.3) Interpret this probability as an indicator of relative overall exterior quality of 262 Campbell Avenue on Campbell Avenue in 2013, especially after adding it to the calculated probability in sub-question (1.1) to calculate the probability of a Campbell Avenue house having a poorer *pHQ2013* overall exterior housing quality than 262 Campbell Avenue's *pHQ2013* in 2013.

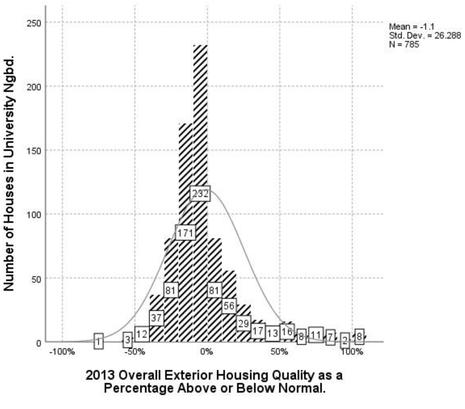
(3) If 262 Campbell Avenue has a *pHQ2013* overall exterior housing quality of 42%, then (3.1) compare the position and height of the histogram's bar including its *pHQ2013* with the histogram's bar containing the modal class of all Campbell Avenue houses'*pHQ2013s* in 2013. (3.2) Use this comparison of the histogram's bars to infer the relative overall exterior quality of 262 Campbell Avenue on Campbell Avenue in 2013.

(4)



If 262 Campbell Avenue has 'new' *at01_13* shingles in 2013, then (4.1) compare its *at01_13* shingles condition with the modal class of all Campbell Avenue houses' *at01_13* shingles condition in 2013. (4.2) Proceed to calculate the probability of a Campbell Avenue house having poorer *at01_13* shingles condition than that of 262 Campbell Avenue in 2013. That is, calculate the probability of a Campbell Avenue house having normal, curling and lifting, or torn shingles. (4.3) Interpret this probability in conjunction with the comparison in sub-question (4.1) to infer the relative shingles condition of 262 Campbell Avenue on Campbell Avenue in 2013.

(5)



Statistics.		All Houses' *pHQ2013* Overall Exterior Housing Quality Percentages in 2013.
N.	Valid.	785
Mean.		(-1.1)%
Median.		(-5.6)%
Std. Deviation.		26.3%
Skewness.		1.6
Kurtosis.		3.3
Minimum.		(-71)%
Maximum.		100%

(5.1) Use the above histogram to explain the by-hand calculation of the probability of a University neighbourhood house having a *pHQ2013* overall exterior housing quality that is less than the mean of all University neighbourhood houses' *pHQ2013s* in 2013. That is, explain the calculation of the probability of a neighbourhood house having a *pHQ2013* that is greater than or equal to (-100)% and less than (-1.1)%. (5.2) Interpret this probability to infer the relative overall exterior quality of University neighbourhood houses in 2013, especially (5.3) in comparison with the expected probability for the range of interest if University neighbourhood houses' *pHQ2013s* have a normal distribution.

(6) If 262 Campbell Avenue has a *pHQ2013* overall exterior housing quality of 42%, then use the histogram above the previous question to (6.1) compare its *pHQ2013* with the mean of all University neighbourhood houses'*pHQ2013s* in 2013. (6.2) Proceed to explain the by-hand calculation of the probability of a University neighbourhood house having a *pHQ2013* overall exterior housing quality between this mean of all neighbourhood houses' *pHQ2013s* and 262 Campbell Avenue's *pHQ2013*. That is, explain the calculation of the probability of a neighbourhood house having a *pHQ2013* that is greater than or equal to (-1.1)% and less than 42%. (6.3) Interpret this probability as an indicator of 262 Campbell Avenue's relative overall exterior quality in the University neighbourhood as a whole, especially after adding this probability to that in sub-question (5.1) to calculate the probability of a University neighbourhood house having a poorer *pHQ2013* overall exterior housing quality than 262 Campbell Avenue's *pHQ2013* in 2013.