

Students Project (Fall 2019-2020)- *Mathematical Modelling of a class of Composite Islamic Geometric Patters*

Student

Amal Rabah (U15106248)

Abstract

Islamic designs encompass the visual arts produced in Islamic world. In this research we will present symmetrical composite designs using Islamic geometric patterns by constructing graphs on Unit Circle.

Students Project (Fall 2019-2020)-*Edge Metric Dimension*

Student

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Abstract

The edge metric dimension of a graph is introduced based on the distance of edges of the graph , we will compute the edge metric dimension of chain of cycle for even , odd , and alternating cycle wih odd and even and we will prove that they have $edim = 2$.

Students Prjoect (Spring 2018-2019)-*Chi-Square Tests with Applications*

Students

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Abstract

Testing relationships between categorical or qualitative variables for real-life is one of the important approaches of statistics for analyzing data which is widely used today.

Chi square distribution is a type of cumulative probability distribution, which provide the probability of every possible value that may occur. Chi square test is a statistical procedure derived from the chi-square distribution to compare the goodness of fit of theoretical and observed frequency distributions or to compare nominal data derived from unmatched groups of subjects.

In this project, we thoroughly demonstrated the concept of statistics and the main areas and types of statistics. The element of hypotheses testing with the methods concerning in p-value approach to specify the rejection and non-rejection regions then determine the types of errors will occur when reject or not reject. Explain Proportion for population in more details and present the procedure to perform tests of hypotheses for one sample and two samples both provided by a complete example. Moreover, we will discuss the case where there are more than two samples which is the Chi-square test, and this is the main topic of this research. We will discuss the chi square distribution, contingency table and goodness of fit test. A case study is included and used to apply all the illustrated theory using SPSS software. The results are shown in complete details.

Project (Fall 2018-2019): *Distribution Theory of Simple Linear Regression with Applications*

Student: Mariam A. Orabi U14123143

Supervisor: Dr. Luai M. Al-Labadi

Abstract: Regression analysis is a statistical methodology that utilizes the relation between two or more variables so that one variable can be predicted from the other, or the others (Neter, Kutner, Nachtsheim and Wasserman, 1996). Building valid models for real-life data is one of the most important approaches of statistics for analyzing data which is widely used today. Successful applications require understanding of both the underlying theory and the practical problems that are encountered when building models for real-life data. The simplest form of regression is the simple linear regression, which considers only one explanatory variable linearly related to the response variable. Understanding simple linear regression enables the reader to look at many aspects of regression in the simplest possible setting. In this project, we thoroughly demonstrated the concept of simple linear regression. The model parameters are estimated using two methods, namely, least squares method and maximum likelihood method. It is shown that the estimators are equal in both methods, and proven to be good estimates, for which, the proof of Gauss-Markov theorem is provided. In order to check the validity of the model, statistical inferences about the parameters along with diagnostic methods to assure the validity of the model's assumptions are explained. When encountering specific problems, suggestions and some transformations are provided to overcome such problems. An example is

included, and used to apply all the illustrated theory using RStudio software. The R-code and the results are shown in complete details.

Project (Spring 2017-2018): *Bayesian Inference: One-parameter Models*

Students: Israa F.M. Alhamarna
Ragad W.A. Albarghash

Abstract:

There are two main opposing schools of statistical reasoning, frequentist and Bayesian approaches. Until recent days, the frequentist or classical approach has dominated the scientific research, but Bayesianism has reappeared with a strong impulse that is starting to change the situation. The basic notions about these two approaches to inference are presented and the corresponding terminology is introduced.

Project II(Spring 2017-2018): *Bayesian Inference: Multi-parameter Models*

Student: Maitha khalid AlAli

Abstract:

Two main methods of statistical inference can be found in the literature of statistics. The first one is known as the frequentist (or classical) approach. This approach has been studied in 1440-361 (Mathematical Statistics). The second method to inference, which will be the choice of this project, is called the Bayesian approach. This approach can be viewed as the modern statistics to inference and it differs from the classical one in that it specifies a probability distribution for the parameter(s) of interest. The goal of this project is to extend the one-parameter Bayesian approach to the Multi-parameter case. Examples and real life applications are also considered. Section 1 - Section 6 are done jointly with Israa Alhamarna and Ragad Albarghash.