Chairman’s Note

In this ever changing world the importance of time management can not be kept aside. Right decisions taken at right time can lead us to achieve our goals and to make our dreams come true. The above views are sweetly summarized in the following quotes:

Dreams come in sleep but dream is __that does not let you sleep.

Time has a strange habit, it keeps going ,making all humans dispensable __but provides the unique opportunity to all.

The success of an individual is how one utilizes.

Hard work always pays off.

A TRIBUTE TO DR. ABDUL JABBAR

Dr. Abdul Jabbar, a source of inspiration in education and administration work, passed away on the evening of March 21, 2009 (May Allah bless his soul). He was born in 1949 at Faisalabad. After completing M.Sc. Mathematics, he joined education department as a Lecturer at Govt. College Faisalabad in 1974. He completed his M.Phil from Quaid-e-Azam University, Islamabad in 1986. Dr. Abdul Jabbar completed his PhD from University of the Birmingham, England in 1992 and returned to Pakistan in 1992. After his return to Pakistan, he performed teaching as well as administrative duties at various colleges in Faisalabad. The year 1998 brought the reward of his hardworking life when he was selected as Associate Professor and within an year he was selected as Professor of Mathematics by Punjab Public Service Commission. In April 2000 he took over the charge of Principal, Government College, Gujranwala and in September 2000 he became Principal of Government College of Science, Faisalabad.

Under his tenure, Science College was declared as the best college by Board of Intermediate and Secondary Education, Faisalabad. In September 2005 he joined COMSATS Institute of Information Technology, Lahore Campus. Along with teaching assignments he was also Member board of studies, member board of trustees, convener of various committees that include Convocation 2006 and 2007, Transport, Mosque, cafeteria & shopping center and Warden boys hostel. Dr. Abdul Jabbar will always be remembered for his tremendous service to education.
Isomorphism in Graphs

By

Asim Razzaq

The word isomorphism came from Greek roots, its meaning is roughly “equal shapes.” We say that two graphs are isomorphic if there is a function f that maps the vertex set of one graph to the vertex set of the other; additionally, this function must be a bijection (one-to-one and onto) and it must respect the edge endpoint relation. That is, if u and v are connected by some number of edges in the first graph then f (u) and f (v) are connected by the same number of edges in the second.

There are a great number of properties called graph invariants that can be used to decide whether graphs are not isomorphic. Two isomorphic graphs must have the same number of vertices and edges. Clearly these conditions are not sufficient.

One feature that can be used to distinguish the graphs is the degree of their vertices. The degree of a vertex v in a graph G is the number of edges that are incident with it. (Note that since a loop is incident twice with the same vertex, it will add two to the degree of that vertex.)

Other graph invariants that are used to detect the difference between non isomorphic graphs are: the number of cycles of a given length, connectedness, degree sequence of vertices and edges, Hamiltonicity and Euler Properties of graphs.

Axial Couette flow between two circular cylinders

by

Fiza Batool

The velocity field and the adequate shear stress, corresponding to the unsteady flow of Newtonian fluid between two rotating circular cylinders are determined. The solutions that have been obtained satisfy all imposed initial and boundary conditions. Furthermore, the solutions for Newtonian fluid are also obtained as special cases of our solutions when Inner cylinder is stationary, both cylinders rotates with same velocity in the same direction, both cylinders rotates with same velocity but in opposite direction.
ABOUT THE FAMOUS MATHEMATICIAN
AUGUSTIN CAUCHY

Augustin Louis Cauchy was born on August 21, 1789, in Paris, the eldest of six children. By the time he was 11, both Laplace and Lagrange had recognized Cauchy’s extraordinary talent for mathematics. In school he won prizes for Greek, Latin and the humanities. At the age of 21, he was given a commission in Napoleon’s army as a civil engineer. For the next few years, Cauchy attended to his engineering duties while carrying out brilliant mathematical research on the side. In 1815, at the age of 26, Cauchy was made Professor of Mathematics at the École Polytechnique and was recognized as the leading mathematician in France. Cauchy and his contemporary Gauss were the contributors to nearly every branch, both pure and applied, as well as to physics and astronomy. Cauchy introduced a new level of rigor into mathematical analysis. We owe our contemporary notions of limit and continuity to him. He gave the first proof of the Fundamental Theorem of Calculus. Cauchy was the founder of complex function theory and a pioneer in the theory of permutation groups and determinants. His total written output of mathematics fills 24 large volumes and is second only to Euler. He wrote over 500 research papers after the age of 50. Cauchy died at the age of 67 on May 23, 1857.

RESEARCH IN PROGRESS


Sarfraz Ahmad, Imran Anwar, “An Upper Bound for the regularity of ideals of Borel type”, Accepted for publication in Communication in Algebra.


Muhammad Mohsin, “Characterization of Erlang-truncated exponential distribution by the Conditional Expectation of Record Values”, Submitted for the publication to Mathematical Research letter.
Statistical Models are powerful tools for prediction and forecasting. Several situations arise where these models come as a rescuer for the researcher. Some examples where the applicability of statistical models is evident are:

The economist may want to forecast the inflation rate of a country in the future based upon information of available variables.

The demographist may be interested in forecasting the population of a country so that proper planning can be done.

The production manager may be interested to predict the production at a plant for various combinations of input variables.

An zoologist might be interested to compare the growth of an animal for various available combinations of food; etc.

In all above situations the statistical models comes for the rescue. The statistical models that are capable to forecast are known as the **Time Series Models**. These models are applied to data collected from a respondent on several equally spaced time points; known as the Time Series Data.

The classical models for the analysis of time series data are known as the Autoregressive Integrated Moving Average models and are abbreviated as **ARIMA(p,d,q)** models. The ARIMA(p,d,q) model is specifically given as:

\[ \Delta^d Y_t = \mu + \phi_p (B) Y_t + Z_t + \theta_q (B) Z_t + x_t \beta \]

where \( \Delta^d \) is backshift operator; \( \mu \) is the vector of predictors at time \( t \); \( \phi \)'s, \( \theta \)'s and \( \beta \)'s are parameters of the model. The model (1) indicates that the response at time \( t \) is a function of response at previous time points and the random error component. In practice the model (1) is fitted to an available set of data with optimum combination of \( p \), \( d \) and \( q \). The fitting of the model (1) can be carried out by using any of the popular softwares like SAS, STATA, EViews, SPSS etc. One very important issue in fitting of model (1) is to see the significance of various parameters of the model. This is done by using the \( t \)-statistic for model parameters.

The model (1) has various special cases that are:

For \( d = q = 0 \) the model is called Autoregressive Model of order \( p \); **AR(p)**

For \( d = p = 0 \) the model is called Moving Average Model of order \( q \); **MA(q)**

For \( d = p = q = 0 \) the model is Classical Regression Model of order \( q \); **MA(q)**

Each of the above specified models has the specific use depending upon the nature of the data. The most popular form of the model (1) that is used in practical life for a time series data is the Autoregressive Model. The Autoregressive model assumes that the response is only dependent upon its previous values. The idea can be illustrated by fitting the model (1) on the yearly sales; in thousand units; given as 23.32, 25.14, 25.56, 24.12, 26.65, 28.91, 27.32, 29.45, 32.61, 28.68, 31.67, 34.76, 37.56, 34.98, 39.54. The fitted model; by using STATA; is

\[ Y_t = 30.797 + 0.905Y_{t-1} \]. Now this model can be used to forecast the sales for coming years.

**Dr. Muhammad Qaiser Shahbaz**

**Asst.Professor**

We hope to see you all again through this invisible and indefinable connection that MATHEMATICS BULLETIN has established between the readers and writers.

**GOODBYE!!**