



K. J. Somaiya Institute of Management Studies & Research

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Issue 10



Quantinum Newsletter



Quantinum -
The Quants Forum

Its all about NUMBERS...



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Quantinum Newsletter

VOLUME 1:ISSUE 10 DEC-10':JAN-11'

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CROSSWORD 11-
CONTRIBUTED BY
PROF.
NILAKANTAN

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From the Faculty's Desk...

Hi All,

We are closing the year 2010 with considerable satisfaction, while we do recognize that there's still a lot more that can be done.

Continuing with our efforts to improve the newsletter, I am releasing Totem Crossword 2 in this issue. I have not received any feedback on the first one and would expect some of you to write in your comments to make it more interesting and perhaps to simplify the clues.

The answer for Totem Crossword 1 is also being released in this issue. I would expect the readers to link the clues with the answers and understand the general thinking which has gone into the design.

In January, we start the New Year and also will be celebrating the second anniversary of Quantinum. All alumni are hereby requested to send in their articles and suggestions to make the function a success.

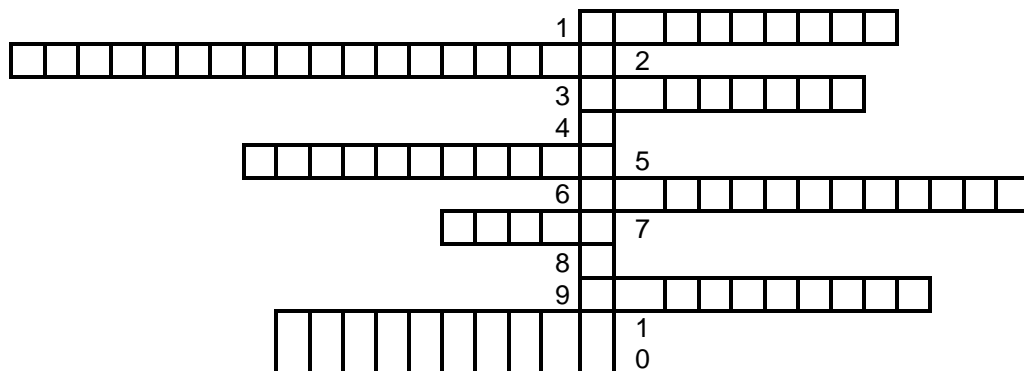
I request the event organizers also to contact the alumni in this regard.

I take this opportunity to wish all the readers a very happy 2011.

Regards,

Prof. N.S.Nilakantan

QUANTS TOTEM CROSSWORD 2



CLUES (Results are words: Concepts or Techniques or Acronyms in Quants Area):

1. I am superfluous to provide a solution (9)
2. I am man-made with a large number (10-8)
3. When I am attached to a line, I become 'slopy' (8)
4. I'm not an animal but an OS- open to assist you statistically (1)
5. I'm your 2nd choice but more flexible than the first in many situations (11)
6. I help you organize shipments, sitting in a Japanese Garden (8-5)
7. I am linearly independent and also spanning (5)
8. I am not real but when you put me on a complex plane, I travel vertically (1)
9. At last you have reached me (10)
10. You can enjoy complexity again and again in Monte Carlo (10)

MAIN WORD: Exploring past life also predicts future (10)

QUANT NEWS DIGEST

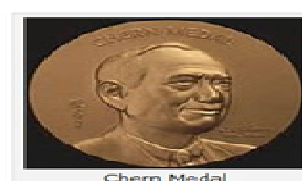
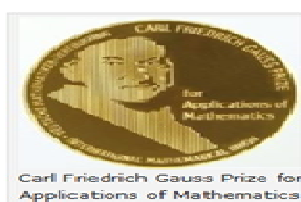
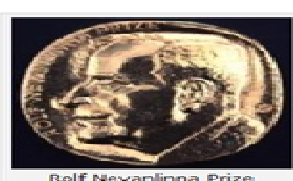


International Congress of Mathematicians

Hyderabad, India 19- 27 August 2010

The International Congress of Mathematicians (ICM) is the largest congress in the mathematics community. It is held once every four years under the auspices of the International Mathematical Union (IMU). The Fields Medals, the Nevanlinna Prize, and the Gauss Prize are awarded during the congress' opening ceremony. In the 2010 ICM, a new prize also will be awarded, the Chern Medal Award.

The IMU has been awarding the Fields Medals- generally considered the "Nobel Prize for mathematics" – since 1936, the Nevanlinna Prize in the field of theoretical computer science since 1982, and the Gauss Prize for applied mathematical work since 2006. The Fields Medals and the Nevanlinna Prize are given to young researchers below 40 years of age, in recognition of specific path breaking results. The Gauss Prize recognizes mathematical results that have opened new areas of practical applications.



Prizes	Winners	Area of Work
Field Medal	Elon Lindenstrauss	Results on measure rigidity in ergodic theory, and their applications to number theory.
Field Medal	Nau Bao Chao	Proof of the Fundamental Lemma in the theory of automorphic forms through the introduction of new algebro-geometric methods
Field Medal	Stanislav Smirnov	Proof of conformal invariance of percolation and the planar Ising model in statistical physics.
Field Medal	Cedric Villani	proofs of nonlinear Landau damping and convergence to equilibrium for the Boltzmann equation.
Nevanlinna Prize	Daniel Spielman	Smoothed analysis of Linear Programming, algorithms for graph-based codes and applications of graph theory to Numerical Computing.
Guass Prize	Yves Meyer	Fundamental contributions to number theory, operator theory and harmonic analysis, and his pivotal role in the development of wavelets and multiresolution analysis
Chern Prize	Louis Nirenberg	Formulation of the modern theory of non-linear elliptic partial differential equations and for mentoring numerous students and post-docs in this area.

MEENU MITTAL
PGDM IB
2010-12

MAIN STORY: Vedic Mathematics IV

In this 4th concluding edition of Vedic Mathematics Tutorial, as usual we will learn few more techniques to speed up the process of mental mathematical calculation.

Square numbers that end in 5

Q: $75^2 = ?$

Solution: The answer, here, is in two parts:

The last part is always **25**.

The first part is the first number, 7, multiplied by the number "one more", which is 8:

$$75^2 = 5625$$

so $7 \times 8 = 56$

So $75^2 = 5625$.

Multiply numbers where the first figures are the same and the last figures add up to 10

Q: $32 \times 38 = ?$

Solution: Both numbers here start with 3 and the last figures (2 and 8) add up to 10.

So we just multiply 3 by 4 (the next number up) to get **12** for the first part of the answer.

And we multiply the last figures: $2 \times 8 = 16$ to get the last part of the answer.

So $32 \times 38 = 1216$.

$$32 \times 38 = 1216$$

Adding time

Q: (1 hr and 35 mins) + (3hr and 55 mins) = ?

First add 1 hr and 35 minutes and 3 hr 55 minutes together.

$$\rightarrow 135 + 355 = 490$$

Now, if the last 2 digits of the sum are greater than or equal to 60, then just add 40 time constant to the sub total.

$$\Rightarrow 490 + 40 = 530 \text{ (Read it as 5hr and 30min)}$$

Note: if the last 2 digits of the sum are less than 60 (eg. the sum is 450), then the answer is basically obtained by reading the sum as 4hrs and 50 mins.

$$\text{So } (1 \text{ hr and } 35 \text{ mins}) + (3 \text{ hr and } 55 \text{ mins}) = (5 \text{ hr and } 30 \text{ min})$$

TARUN SETHI
PGDM A
2010-2012



“Women have a passion for mathematics. They divide their age in half, double the price of their clothes, and always add at least five years to the age of their best friend.”- Marcel Achard

Quancept of the month: "NUMEROLOGY"

Numerology is any of many systems, traditions or beliefs in a mystical or esoteric relationship between numbers and physical objects or living things.

Numerology and numerological divination by systems such as isopsephy were popular among early mathematicians, such as Pythagoras, but are no longer considered part of mathematics and are regarded as pseudo-mathematics by modern scientists. This is similar to the historical relationships between astrology and astronomy, and between alchemy and chemistry.

Today, numerology is often associated with the occult, alongside astrology and similar divinatory arts. The term can also be used for those who place excess faith in numerical patterns, even if those people don't practice traditional numerology. For example, in his 1997 book *Numerology: Or What Pythagoras Wrought*, mathematician Underwood Dudley uses the term to discuss practitioners of the Elliott wave principle of stock market analysis.

St. Augustine of Hippo (A.D. 354–430) wrote "Numbers are the Universal language offered by the deity to humans as confirmation of the truth." Similar to Pythagoras, he too believed that everything had numerical relationships and it was up to the mind to seek and investigate the secrets of these relationships or have them revealed by divine grace.

Alphabetic systems:

There are many numerology systems which assign numerical value to the letters of an alphabet. Examples include the Abjad numerals in Arabic, the Hebrew numerals, Armenian numerals, and Greek numerals. The practice within Jewish tradition of assigning mystical meaning to words based on their numerical values, and on connections between words of equal value, is known as *gematria*.

1= a, j, s; 2= b, k, t; 3= c, l, u; 4= d, m, v; 5= e, n, w; 6= f, o, x; 7= g, p, y; 8= h, q, z; 9= i, r
...and are then summed.

Examples:

- 3,489 → 3 + 4 + 8 + 9 = 24 → 2 + 4 = 6
- Hello → 8 + 5 + 3 + 3 + 6 = 25 → 2 + 5 = 7

A quicker way to arrive at a single-digit summation (the digital root) is simply to take the value modulo 9, substituting a 0 result with 9 itself.

Some lucky number combinations include:

99 — doubly long in time, hence eternal; used in the name of a popular Chinese-American supermarket chain, 99 Ranch Market.

168 — road of prosperity or to be prosperous together literal translation is "continuing to be wealthy"— many premium-pay telephone numbers in China begin with this number. It is also the name of a motel chain in China (Motel 168).

888 — Three times the prosperity, means "wealthy wealthy wealthy". (E.g., the 2008 Summer Olympics in Beijing were designated by the Chinese officials to begin on the most auspicious date possible to ensure the success of the Games for its hosts: August 8, 2008—on the 8th day, of the 8th month in the 8th year of the new millennium.)

Some astrologers believe that each number from 0 to 9 is ruled by a celestial body in our solar system. Many Alchemical theories were closely related to numerology. Persian alchemist Jabir ibn Hayyan, inventor of many chemical processes still used today framed his experiments in an elaborate numerology based on the names of substances in the Arabic language.

Numerology in science

Scientific theories are sometimes labeled "numerology" if their primary inspiration appears to be a set of patterns rather than scientific observations. This colloquial use of the term is quite common within the scientific community and it is mostly used to dismiss a theory as questionable science.

The best known example of "numerology" in science involves the coincidental resemblance of certain large numbers that intrigued such eminent men as mathematical physicist Paul Dirac, mathematician Hermann Weyl and astronomer Arthur Stanley Eddington. These numerical co-incidences refer to such quantities as the ratio of the age of the universe to the atomic unit of time, the number of electrons in the universe, and the difference in strengths between gravity and the electric force for the electron and proton.

Numerology in gaming

For example, numerology is frequently used in the game of roulette where players bet on a single number. Special tools called the Lucky number generators are used to find out person's lucky numbers based on basic principles of this study.

Popular culture

Numerology is a popular plot device in fiction. It can range from a casual item for comic effect, such as in an episode titled *The Seance* of the 1950s TV sitcom *I Love Lucy*, where Lucy dabbles in numerology, to a central element of the storyline, such as the movie π , in which the protagonist meets a numerologist searching for hidden numerical patterns in the Torah. The movie *The Number 23*, starring Jim Carrey, was based on the mystery of the number 23.

In the world of Harry Potter, Hermione Granger's favorite subject is arithmancy. The novels don't offer much detail, but they make it clear that arithmancy involves the magical properties of numbers. Hermione learns to use complex charts to perform numerical divination, or tell the future using numbers.

With the rising number of people believing in numerology, those in the business are becoming busier by the day. Not just the common man, but even film stars are falling prey to these professionals before deciding any aspect of their lives. While a layman can add just the digits on a number plate, it is the entire number plate which is to be considered before arriving at the final lucky number.

Owning a luxurious car is always a style statement and before buying such highly expensive mean machines, most stars play it safe by consulting numerologists to decide for their lucky numbers. Amitabh Bachchan, Shah Rukh Khan, Aishwarya Rai and Saif Ali Khan to name a few have consulted Numerologists for their car numbers.

A SIMPLE EXAMPLE:

There are four main heads of the Pythagorean numerology:

1. The Life Path number

→ tells you about your characteristics and the lessons to be learned in life

2. The Name number

→ tells you about your destiny and you key to success

3. The Personal Year number

→ Used to predict your yearly Numberscope

4. The Present personal day

→ Used to predict your daily Numberscope

How to Calculate your Life Path Number?

In numerology calculation, this is how you calculate your Life Number or Life Path Number. Life number is obtained by adding up all the numbers in your day, month, and the year, from your date of birth.

For Example: Suppose you are born on 12-11-1958

- Add up your day, month and year numbers in 12-11-1958
- That is $\{(1+2) + (1+1) + (1+9+5+8)\}$
- That is $\{(3 + 2 + 23) = 10\}$
- Add 1 and 0 in 10
- $\{(1+0) = 1\}$

That gives you 1, therefore, Your Life Path Number is 1.

Characteristics of life path 1:

You insist on your right to make up your own mind; you demand freedom of thought and action. You assume the responsibility to be the protector and provider for those you love. You demand respect and attention.

Compatibility with 1,3,5,9

Well suited to *careers* in teaching, counseling, research, etc.

DHAVAL TRIVEDI
PGDM B
2010-12

QUANT *GURU* of the MONTH



20 November 1924
14 October 2010

QUANT TRIVIA

**" Not everything that can be counted counts, and not everything that counts can be counted"
Albert Einstein**

Benoit B. Mandelbrot was a Franco-American mathematician. Born in Poland, he moved to France with his family when he was a child. Mandelbrot spent much of his life living and working in the United States, acquiring dual French and American citizenship. Mandelbrot worked on a wide range of mathematical problems, including mathematical physics and quantitative finance, but is best known as the **"father of fractal geometry"**. He coined the term **fractal** and described the **Mandelbrot set**. Mandelbrot extensively popularized his work, writing books and giving lectures aimed at the general public. Mandelbrot spent most of his career at IBM's Thomas J. Watson Research Center, and was appointed as an IBM Fellow. He later became Sterling Professor of Mathematical Sciences at Yale University. Mandelbrot also held positions at the Pacific Northwest National Laboratory, Université Lille Nord de France, Institute for Advanced Study and Centre National de la Recherche Scientifique.

From 1951 onward, Mandelbrot worked on problems and published papers not only in mathematics but in applied fields such as information theory, economics, and fluid dynamics. He became convinced that two key themes, fat tails and self-similar structure ran through a multitude of problems encountered in those fields. Mandelbrot found that price changes in financial markets did not follow a Gaussian distribution, but rather Levy stable distributions having theoretically infinite variance. He found, for example, that cotton prices followed a Levy stable distribution with parameter α equal to 1.7 rather than 2 as in a Gaussian distribution. "Stable" distributions have the property that the sum of many instances of a random variable follows the same distribution but with a larger scale parameter.

Mandelbrot also put his ideas to work in cosmology. He offered in 1974 a new explanation of Olbers paradox, demonstrating the consequences of fractal theory as a sufficient, but not necessary, resolution of the paradox. He postulated that if the stars in the universe were fractally distributed, it would not be necessary to rely on the Big Bang theory to explain the paradox. His model would not rule out a Big Bang, but would allow for a dark sky even if the Big Bang had not occurred.

Mandelbrot left IBM in 1987, after 35 years and 12 days, when IBM decided to end pure research in his division. He joined the Department of Mathematics at Yale, and obtained his first tenured post in 1999, at the age of 75. At the time of his retirement in 2005, he was Sterling Professor of Mathematical Sciences. His awards include the Wolf Prize for Physics in 1993, the Lewis Fry Richardson Prize of the European Geophysical Society in 2000, the Japan Prize in 2003, and the Einstein Lectureship of the American Mathematical Society in 2006.

The small asteroid 27500 Mandelbrot was named in his honor. In November 1990, he was made a Knight in the French Legion of Honour. In December 2005, Mandelbrot was appointed to the position of Battelle Fellow at the Pacific Northwest National Laboratory. Mandelbrot was promoted to Officer of the Legion of Honour in January 2006. An honorary degree from Johns Hopkins University was bestowed on Mandelbrot in the May 2010 commencement exercises.

Mandelbrot died in a hospice in Cambridge, Massachusetts, on 14 October 2010 from pancreatic cancer, at the age of 85. Reacting to news of his death, mathematician Mandelbrot's obituary in *The Economist* points out his fame as "celebrity beyond the academy" and lauds him as the "father of fractal geometry"

GAURAV BHARGAVA
PGDM FINANCE
2009-11



Quantinum, the Quants forum of KJ Somaiya Institute of Management Studies and Research is formed with two objectives. Firstly to remove the common myth from the students mind that mathematics is difficult. Secondly to give students an exposure on how to make decisions in real life business problems using quantitative techniques. This helps to bridge the gap between theory and the practical application.

For any further queries and feedback, please contact the following address

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Watch out for the ANNUAL QUANTINUUM MEET
2011 to be held on January 2011. Be there to experience
the tryst with the world of numbers!