

An interview of a potential user of irrational numbers

Samir Anghan: 40040308

Friday, July 12, 2019

1 Interviewer

Samir Anghan

Concordia University Gina Cody School of Engineering and Computer Science

2 Interviewee

Mehul Patel

Electronics circuit design engineer, Rambus Chip Technologies (India) Private Limited.

M.tech in Electrical Engineering with specialization Electronic Systems from 'Indian Institute of Technology Bombay - India'

3 The rationale for choosing Mehul Patel as an interviewee

Mehul Patel is an Electronics Circuit Design Engineer with a background of mathematics. An electronics circuit design engineer is a person who uses mathematics in their everyday tasks at his/her work. My interviewee, Mehul Patel, also confirmed that almost all electronics circuit design engineers do use of mathematics and an electric circuit simulator using MATHEMATICA Software. They often need to provide numerical values to circuit parameters. This brings to a conclusion that a person who is an electronics circuit design engineer is usually close to the use of mathematics and all numbers including irrational numbers. Hence, I believe that my interviewee is a potential user of given ETERNITY: NUMBERS.

4 Interview questions and responses

Question	<p>As an engineer, which of the following irrational numbers you use or ever used in your everyday tasks at your work?</p> <p>Number 1: Champernowne Constant Number 2: Euler's Number Number 3: Gaussian Integral Number 4: Gelfond's Constant Number 5: Golden Ratio Number 6: Liouville Constant Number 7: Natural Logarithm of 2 Number 8: Pi Number 9: Silver Ratio Number 10: Universal Parabolic Constant Number 11: Plastic Number Number 12: Hilbert Number</p> <p>Please mention here the number (e.g. Number 1, 10, 11) here:</p>
Response	Number - 2,3,5,7,8,9,10,11, I have used.

Question	<p>Do you know any real-life application that uses irrational numbers? Answer in "Yes" or "No" . If yes, please mention.</p>
Response	There are lots of real-life application that uses irrational numbers. Like PI is used in almost all geometric calculation in real life. e is used in compound interest.

Question	<p>If you ever want to use a calculator that computes the value of certain irrational numbers, what other additional functionalities from below list you would like to have in that calculator.</p> <p>Function 1: Calculate the value of irrational number up to given certain decimal places.</p> <p>Function 2: Addition, Subtraction, Multiplication, Division of the Irrational Numbers.</p> <p>Function 3: Classify the given number whether it is rational or irrational.</p> <p>Function 4: Other (Please describe)</p>
Response	<p>Function 1 to 3, I would like to prefer. Apart from these, below functions also I want to prefer</p> <ul style="list-style-type: none"> • can enter the symbol of some generally used irrational number (like PI, e, silver ratio, golden ratio) • common root calculation (squared, cubed) and trigonometric calculation • equation having irrational numbers build up the facility • storage of some calculated irrational parameter

Question	<p>Are you using any existing mathematical software for any required mathematical operations on irrational numbers?</p> <p>Answer in “Yes” or “No” . If “Yes”, please provide information.</p>
Response	<p>Yes, I have used MATLAB and MATHEMATICA software for any required mathematical operation on irrational numbers during my education span.</p>

Question	<p>Silver Ratio (δ_s) is an irrational number, whose value is one plus the square root of 2 and is approximately 2.4142135623. Have you ever used Silver Ratio during your education or at your work?</p> <p>Answer in “Yes” or “No” . If “Yes”, please provide information on why or how you used the Silver Ratio number.</p>
Response	<p>Not practically, but just because of my curiosity in this magic number (silver ratio), I have studied a little about this silver ratio during my education span.</p>

Question	<p>The area of a regular octagon with side length of a can be calculated by following formula which uses Silver Ratio.</p> $A = 2(\sqrt{2} + 1)a^2$ <p>Here the value of the square root of 2 is 1.4142135623730951... (no finite number of digits).</p> <p>According to you, up to what number of certain decimal places, the value of the $\sqrt{2}$ should be used in the above formula to calculate the area of a regular octagon?</p>
Response	<p>It depends on how accurate the area number you want. Generally, a standard scientific calculator uses around 9-10 digit after the decimal point.</p>

5 Analysis of an interview

After having an interview with Mehul Patel, an electronics circuit design engineer, I came to discover a few things regarding the irrational numbers. An interviewee is currently an employee at Rambus Chip Technologies (India) Private Limited and had M.tech in Electrical Engineering with specialization Electronic Systems. He has a passion for mathematics. From the responses of the question, I conclude the following things:

- An interviewee has used or studied many irrational numbers but mostly during his education period.
- An interviewee is aware of some real-life application that uses irrational numbers.
- An interviewee suggested some functions to include in the Calculator (e.g. storage of some calculated irrational parameter).
- An interviewee has some knowledge of Silver Ratio (δ s) number, but he has not used the number practically yet.
- An interviewee suggested to consider up to 9-10 digits after the decimal point of an irrational number for any applications that use the value of an irrational number.