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Aug 30, 2020 11:50 PM IST

Discussion



We are happy to welcome you to the fourth season of HackBenchers. It is the time of the quarter to learn and build something exciting. HackBenchers #4 brings you another interesting topic to explore: The Golden Ratio.

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The Golden ratio is a special irrational number like pi (π) represented as phi, Φ .

Its value is around 1.61803398874989484820...

If the ratio of 2 numbers turns out to be tending to this 1.618 special value, the two numbers are said to be in Golden Ratio.

These 2 numbers can be anything, from sides of a rectangle to curvature of spirals.

Rule of thumb is, just remember that if the ratio of 2 things converges to 1.61803398874989484820 or anything even near that value, these things are said to be in Golden Ratio.

By definition, Two numbers are in the golden ratio if the ratio of the sum of the numbers ($a+b$) divided by the larger number (a) is equal to the ratio of the larger number divided by the smaller number (a/b).

Here is a video by [Khan Academy](#) on the Golden Ratio:



The golden ratio is best approximated by the famous "Fibonacci numbers." Fibonacci numbers are a never-ending sequence starting with 0 and 1 and continuing by adding the previous two numbers. The next numbers in the Fibonacci sequence, for instance, are 1,2,3, and 5.

0

1

1 (0 1)

2 (1 1)

3 (2 1)

5 (3 2)

The ratios of sequential Fibonacci numbers ($2/1$, $3/2$, $5/3$, etc.) approach the golden ratio. In fact, the higher the Fibonacci numbers, the closer their relationship is to 1.618.

$$2/1 = 2$$

$$3/2 = 1.5$$

$$5/3 = 1.66666666 \dots$$

The golden ratio is sometimes called the "divine proportion," because of its frequency in the natural world. The number of petals on a flower, for instance, will often be a Fibonacci number. The seeds of sunflowers and pine cones twist in opposing spirals of Fibonacci numbers. Even the sides of an unpeeled banana will usually be a Fibonacci number—and the number of ridges on a peeled banana will usually be a larger Fibonacci number.

Golden ratio has its applications in all aspects of nature, art, finance, and much more. Below are some examples of the Golden ratio in action:





DID YOU KNOW ? WITH “MAX”

The Golden Ratio (also called the golden rectangle and golden mean) is used by designers in creating product logos.

Nike, Apple, and Volkswagenare a few logos that have been created using the golden ratio illustration.

DESIGNER	CONTRACTOR	DATE	DESIGNER	CONTRACTOR	DATE	DESIGNER	CONTRACTOR	DATE
Carolyn Davidson	Nike	1971	Rob Janoff	Apple Inc	1977	Fritz Koenig	Volkswagen	1938
<p>REFERENCE</p> <p>Bill Bowerman and Phil Knight founded Nike on January 25, 1964, as Blue Ribbon Sports (BRS). Upon changing the name to Nike, Inc. on May 30, 1971, the company adopted the Swoosh as its official logo the same year. Carolyn Davidson, a student at Portland State University during the time Knight taught there, created the logo, attempting to convey motion in its design.</p>			<p>REFERENCE</p> <p>The Apple logo was designed by Rob Janoff in 1977. He designed it with a bite out of the right hand side to clearly depict an apple and not some other fruit. The original multi-colored logo was built to specific colour palette and to indicate apple computers had coloured screens. According to Steve Jobs, the company's name was inspired by his visit to an apple farm while on a Volkswagen Jet.</p>			<p>REFERENCE</p> <p>It's pretty obvious what the Volkswagen logo is (a V over a W in a blue background, surrounded by a circle). The logo was the result of an office competition he was given up with a logo. The winner of the competition (who was 30 Marks for his trouble) was an engineer named Fritz Koenig (the name that who perfected the engine for the Beetle in the 1930s).</p>		

Eligibility

Age: 19 and under (high school, undergraduates)
Avid learner

THEMES



Identify The Golden Ratio In Everyday Objects

Problem Statement

Develop a Frontend/Website/Mobile Application depicting the concept of Golden Ratio, which would let the users understand different applications of Golden ratio in Nature, Art, Architecture and Finance. etc.

Tasks

- Your Application must have a Home Page with pictorial & theoretical explanation of Golden Ratio
- Your Application must have an Examples/Applications Tab, which shows as many unique pictorial/visual representations of Golden Ratio in various fields as possible. Thereby Identifying The Golden Ratio In Everyday Objects. Each field can have multiple representations. Example - Architecture can have 4, Design can have 6, etc. As many examples as possible.

Plus Point if we can filter examples by fields. Example - Filter by Design etc.

- It would be great if you can come up with an **Interactive Tab**, which can be open to your own imagination. It can be anything from uploading images & finding Golden Ratio patterns in them to interactive demos depicting/representing Golden Ratio to your Profile picture in Golden Ratio. Anything you wish!!

[Click here](#) to see a couple of samples.

- Your application must be interactive and visually appealing.

Deliverables

Zip and upload all the source code, executables, deployment instructions, and README files. Please provide the Deployed URL link if deployed anywhere. Or just provide source code to run it locally.

Tech Stack

- Frontend: Open to all frameworks, and languages
- Mobile: Android, iOS - Swift, Open to all frameworks, and languages

PRIZES

Main Prizes



Beginner Explorer

INR 10,000

This category awards the best project from a school team.

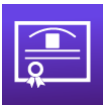


Pro Explorer

INR 10,000

This category awards the best project from a college team. (Must qualify eligibility as mentioned on the page)

Special Prizes



Certificate of Participation

A digital certificate will be given to participants from teams with the top submissions.





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