Gelfonds Constant

Project Overview

- The main theme of the project revolves around Irrational Numbers and Constructing a calculator. Each individual is assigned with a Irrational Number, they have to obtain information about the number from various sources like Interviews,Surveys.
- From the Interviewee, We have to collect the requirements to build the Calculator. All the features mentioned must be implemented.

Gelfond's Constant

- Gelfond's Constant is a Transcendental Number.This constant is named after Aleksandr Gelfond and it is represented as e^{π} that is e raised to the power Pie. The value of Gelfond's constant is: e^{π} = 23:140692632779269005729086367948547 3
- Where e^{π} =$e^{\pi i}$ = $(-1)^{1}$. Here i is imaginary, Since -i is not algebraic, we can say e^{π} is Transcendental.

Design

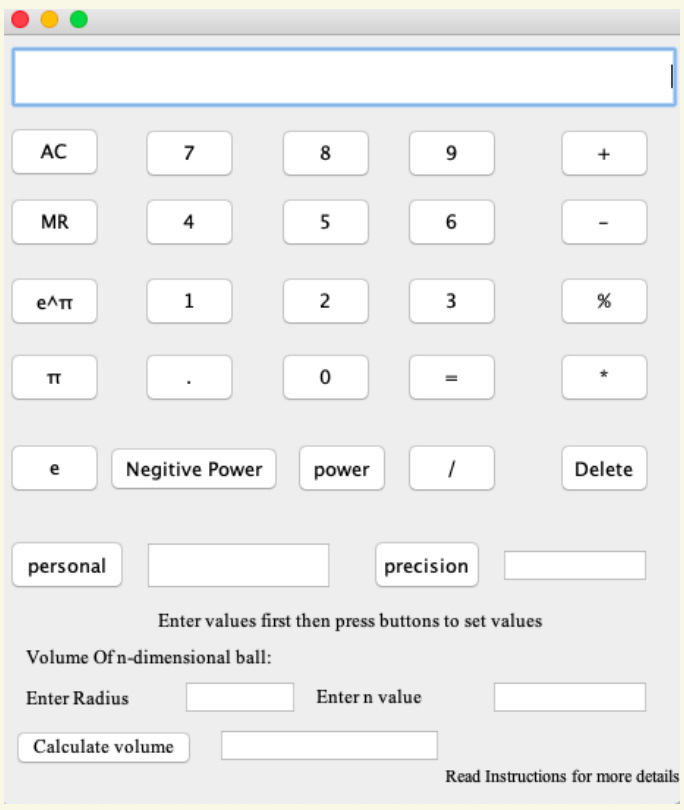

Figure: Calculator

Challenges Faced

- One of the big challenges was calculation and extraction of the Gelfond's constant. A regular power function does not support Double power Double style . Because the storage variable isn't big enough to store the result.
- Gathering enough information about the constant was a big deal too. Since the constant is not widely used and known.
- Applications of the constant are limited, since the constant is intermediate value for calculation gelfond schneider theorem. -It became extremely difficult to find the real world usage of the constant.

Application

- The n-dimensional volume of a Euclidean ball of radius R in n-dimensional Euclidean space is: $V_n = \frac{\pi^{(n/2)}R^n}{\pi(n/2+1)}$

Interesting things

- Even though this constant is used in Gelfond schneider theorem, it is still considered as application to the theorem. Isn't it Interesting?
- This constant is used to calculate Volume of n-ball, here n is dimension. Can you imagine a ball which has n-dimensions, Like 3D,5D,8D.
- Ramanujan's constant: $e^{\pi}\sqrt{163}$ is based on Gelfonds constant. Ramanjuna's constant can be wriiten as $(Gelfondsconstant)^{\sqrt{163}}$

Lessons Learned

- By this project I came to know that irrespective of Personal or Private project, the design and format has to be standard.
- Looking at a problem in all the perspectives in order to get a accurate result. Especially in case of deriving mathematical values

Conclusion

- The requirements stated has been met by appropriately implementing them.
- Sufficient Knowledge on the constant and it's background details had been collected and understood.
- The challenges faced during implementation are successfully handled.