Implementation:

After the designing the GUI of the calculator I started to code the working of each button. As the GUI loads two global variables is initiated

- Shift
- M

Both Variables Is initiated with value equals to 0. The working of these global variables is explained later.

1. **M+:** takes the value/expression from the screen evaluate it and adds to the global variable **M.**
2. **M-:** takes the value/expression from the screen evaluate it and subtracts it from the global variable **M.**
3. **MR:** Clears the screen and Display the value of the global variable
4. **MC:** Clear the value of the Global variable **M.**
5. **Back:** Takes the value from the screen and remove the last value the display the remaining values on the screen
6. **+/-:** Takes the value from the screen and Add the negative sign at the start
7. **%:** Divide the value of the screen by 100
8. **CE:** Remove value/expression from the screen and Change the global variable **Shift** value to 0.
9. **OFF:** Exit from the app with help of closereq() function
10. **2ndF:** Change the value of the global variable **Shift** from 0 to 1 and from 1 to 0. So it can be later used to toggle between Mathematical functions
11. **Round:** Rounds the value with the help of Round function
12. **Hex:** Change the value from decimal to Hex with the help of dec2hex() function
13. **Sin/ArcSin:** A switch case is implemented if the value of global variable **Shift** is 0 Sin function is implemented if the value of global variable **Shift** is 1 Asin function will be used
14. **Cos/ArcCos:** A switch case is implemented if the value of global variable **Shift** is 0 Cos function is implemented if the value of global variable **Shift** is 1 Acos function will be used
15. **Tan/ArcTan:** A switch case is implemented if the value of global variable **Shift** is 0 Tan function is implemented if the value of global variable **Shift** is 1 Atan function will be used
16. **X^2/Squareroot:** A switch case is implemented if the value of global variable **Shift** is 0 square function is implemented if the value of global variable **Shift** is 0 Squareroot function will be used

17. **Ln/Log:** A switch case is implemented if the value of global variable **Shift** is 0 Natural log function is implemented if the value of global variable **Shift** is 1 Log function will be used
18. **Exp/10^x:** A switch case is implemented if the value of global variable **Shift** is 0 Exp function is implemented if the value of global variable **Shift** is 1 10^x function will be used

Testing

The Calculator was tested with each function. There were too much errors at the start but with trail and error method I overcome almost all the errors and were removed. The application is almost error free but there is small error I couldn't solve i.e when evaluated the value of Arcsin beyond its domain

i.e [-1,1] it gives the result as an imaginary num.