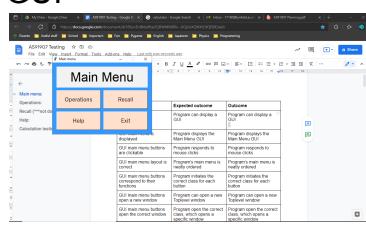
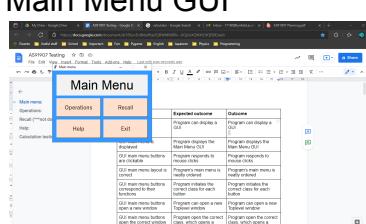
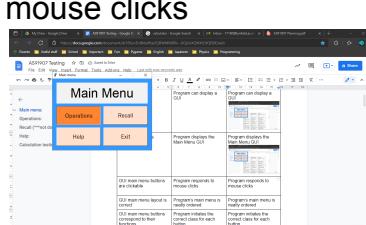
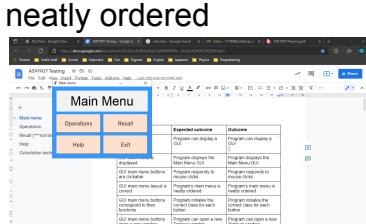
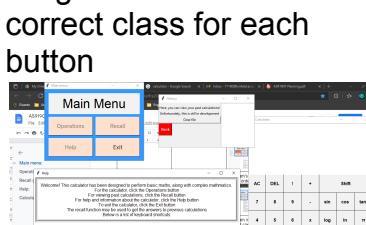


Main menu:

Test	Expected outcome	Outcome
GUI runs	Program can display a GUI	Program can display a GUI 
GUI main menu is displayed	Program displays the Main Menu GUI	Program displays the Main Menu GUI 
GUI main menu buttons are clickable	Program responds to mouse clicks	Program responds to mouse clicks 
GUI main menu layout is correct	Program's main menu is neatly ordered	Program's main menu is neatly ordered 
GUI main menu buttons correspond to their functions	Program initiates the correct class for each button	Program initiates the correct class for each button 
GUI main menu buttons	Program can open a new	Program can open a new

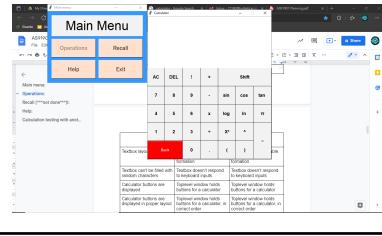
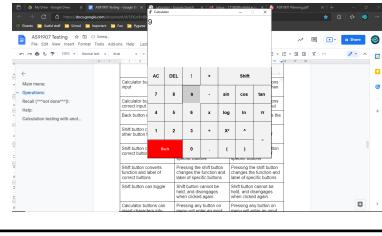
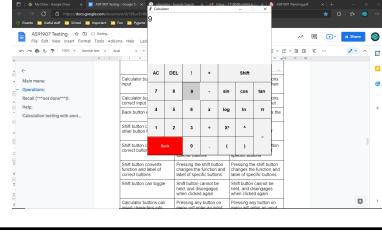
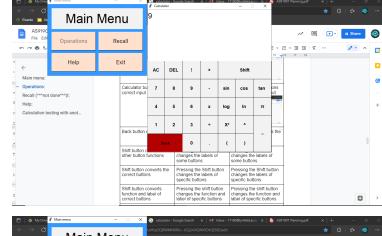
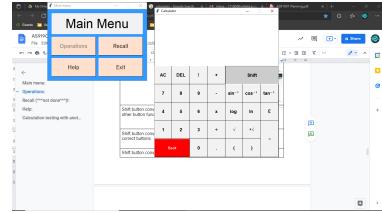
open a new window	Toplevel window	Toplevel window
GUI main menu buttons open the correct window	Program open the correct class, which opens a specific window	Program opens the correct class, which opens a specific window
GUI buttons disable themselves after being clicked	Menu button can't be clicked again when clicked once	Menu button can't be clicked again when clicked once
GUI buttons enable themselves when toplevel is closed	Menu button re-enables itself when Toplevel window is closed	Menu button re-enables itself when Toplevel window is closed

GUI buttons can be opened again and again	Program Main Menu buttons can be used as many times	Program Main Menu buttons can be used as many times
GUI window can't be resized	Program window can't be resized	Program window can't be resized
GUI window can be closed via exit	Program can exit itself	Program can exit itself

Operations:

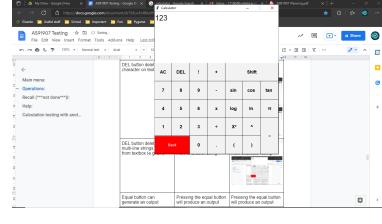
Textbox appears	Program displays a	Program displays a
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	textbox	textbox
Textbox layout is proper	Textbox is of reasonable size and correct grid formation	Textbox is of reasonable size and correct grid formation
Textbox can't be filled with random characters	Textbox doesn't respond to keyboard inputs	Textbox doesn't respond to keyboard inputs
Calculator buttons are displayed	Toplevel window holds buttons for a calculator	Toplevel window holds buttons for a calculator
Calculator buttons are displayed in proper layout	Toplevel window holds buttons for a calculator, in correct order	Toplevel window holds buttons for a calculator, in correct order
Calculator buttons have correct labels	Toplevel window holds buttons, which have labels on them	Toplevel window holds buttons, which have labels on them

		
Calculator buttons give input	Toplevel window buttons that give response when clicked	Toplevel window buttons that give response when clicked 
Calculator buttons give correct input	Toplevel window buttons give their label as input	Toplevel window buttons give their label as input 
Back button exits window	The exit button closes the Toplevel window	The exit button closes the Toplevel window 
Shift button converts other button functions	Pressing Shift button changes the labels of some buttons	Pressing Shift button changes the labels of some buttons 

Shift button converts the correct buttons	Pressing the Shift button changes the labels of specific buttons	Pressing the Shift button changes the labels of specific buttons
Shift button converts function and label of correct buttons	Pressing the shift button changes the function and label of specific buttons	Pressing the shift button changes the function and label of specific buttons
Shift button can toggle	Shift button cannot be held, and disengages when clicked again	Shift button cannot be held, and disengages when clicked again
Calculator buttons can insert characters into textbox	Pressing any button on menu will enter an input on textbox	Pressing any button on menu will enter an input on textbox
Calculator buttons insert correct characters into textbox	Pressing any button on menu will enter the corresponding input on textbox	Pressing any button on menu will enter the corresponding input on textbox

Calculator buttons can send multi-character strings into textbox (e.g.sin)	Pressing specific buttons on menu will input a multi-character string on textbox	Pressing specific buttons on menu will input a multi-character string on textbox
AC button clears textbox	Pressing the AC button clears the textbox	Pressing the AC button clears the textbox
DEL button deletes one character on textbox	Pressing the DEL button deletes one character from textbox	Pressing the DEL button deletes one character from textbox
DEL button deletes multi-line strings properly from textbox (e.g. sin)	Pressing DEL button deletes a whole multi-character string	Pressing DEL button deletes a whole multi-character string

		
Equal button can generate an output	Pressing the equal button will produce an output	Pressing the equal button will produce an output
Equal button can calculate an output	Pressing the equal button will calculate an output and present it	Pressing the equal button will calculate an output and present it
Equal button produces correct mathematical output	Pressing the equal button will calculate an output that follows mathematical conventions	Pressing the equal button will calculate an output that follows mathematical conventions
Math calculations follow BEDMAS	When multiple operations are present, program will follow the BEDMAS structure	When multiple operations are present, program will follow the BEDMAS structure
Math calculations produce correct output	Program can calculate a result from an equation	Program can calculate a result from an equation

Output is printed on a new line	Pressing the equal button presents the output on the line underneath the input	Pressing the equal button presents the output on the line underneath the input
Constants are proper values	Characters that represent numerical constants (pi, euler) are converted to its proper values when inputted	Characters that represent numerical constants (pi, euler) are converted to its proper values when inputted
Can detect stack errors	Program returns an error message that doesn't break the program	Program returns an error message that doesn't break the program
Can detect math errors	Program returns an error message that doesn't break the program	Program returns an error message that doesn't break the program
Back button works	Back button closes the window	Back button closes the window

Can show error message	Program can display an error message without breaking the program	Program can display an error message without breaking the program
		

Recall (not done**):**

Opens a new window	Program opens a new Toplevel window	Yes, program can open a new Toplevel window
		
Can read from text file	Program reads text from text file	File is never used
Can create a list	Program creates list of values	List never generated
List contains correct values from text file	Program creates list of values from text file	List has no values
List is scrollable	Listbox is scrollable	List has no values
GUI layout is proper	GUI layout is neat	GUI layout is messy
		
Recall button can store to a variable	Pressing recall button stores a value	Button not implemented
Recall buttons stores the correct value	Pressing recall button stores the selected value	Button not implemented
Back button works	Back button closes window	Back button closes window

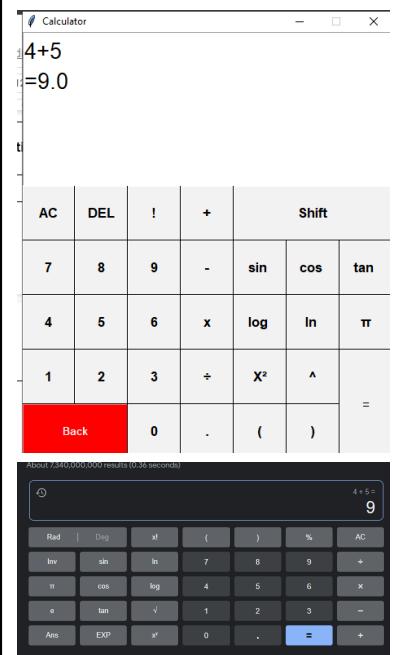


Help:

GUI display	Program displays a GUI	
Information displayed	Information from external text file is read	
Information displayed clearly	Information is displayed in a neat manner	
Back button works	Back button closes window	

Calculation testing with another calculator:

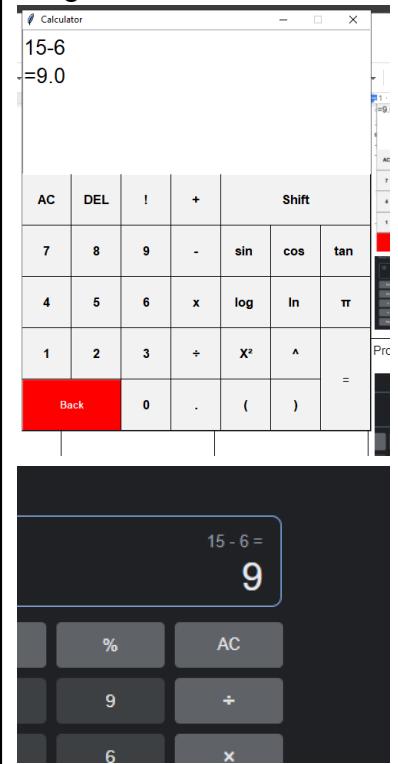
Adding	Program adds values	Program adds values
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Subtracting

Program subtracts values

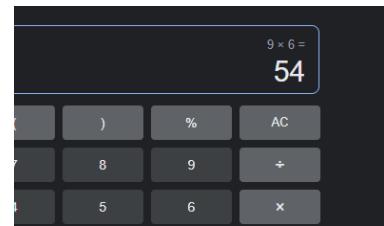
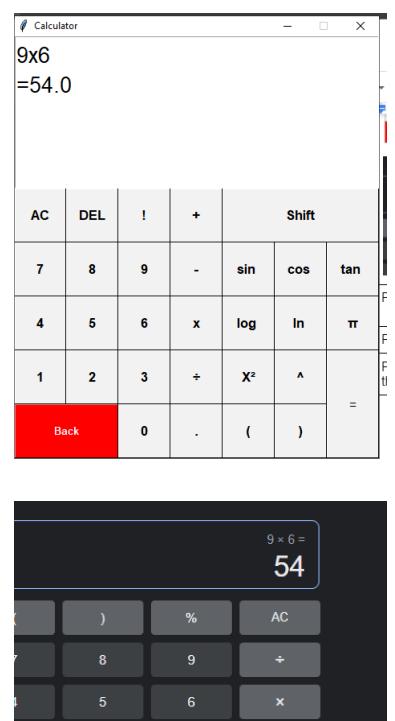
Program subtracts values



Multiplication

Program multiplies values

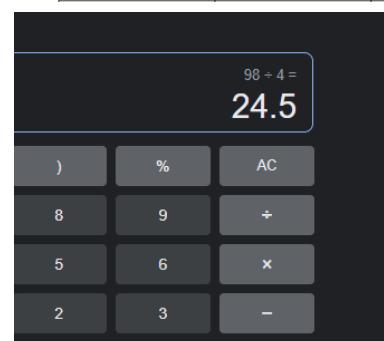
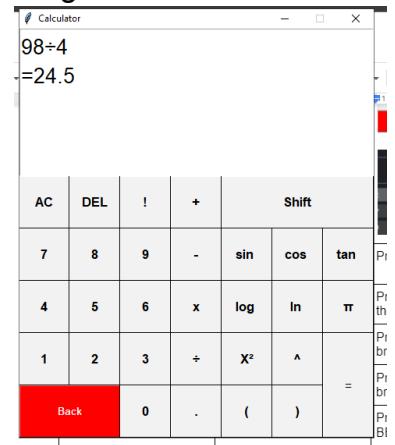
Program multiplies values



Dividing

Program divides values

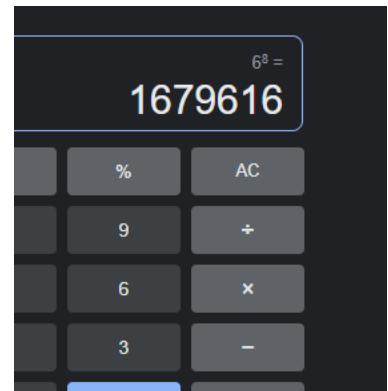
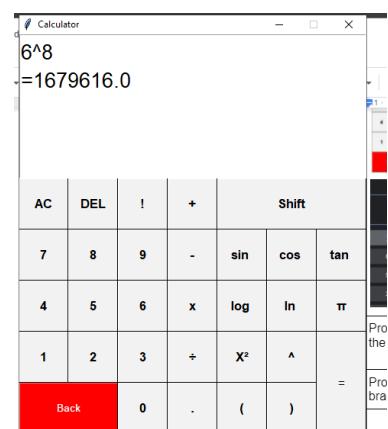
Program divides values



Exponents

Program raises a value to the power of other value

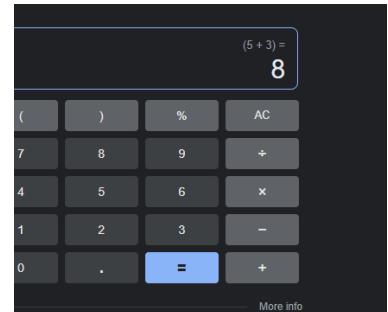
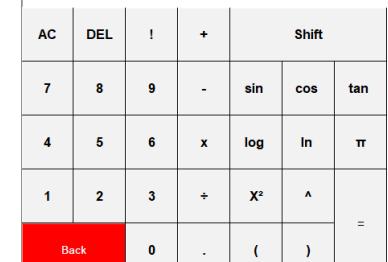
Program raises a value to the power of other value



Brackets

Program calculates bracketed values first

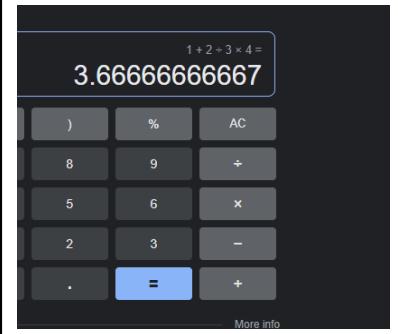
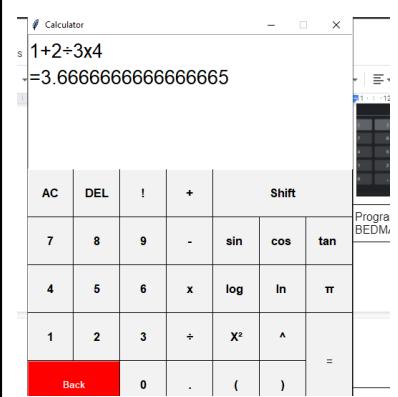
Program calculates bracketed values first



Multiple operations

Program follows BEDMAS

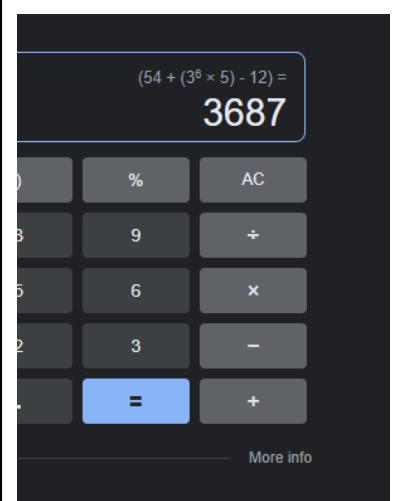
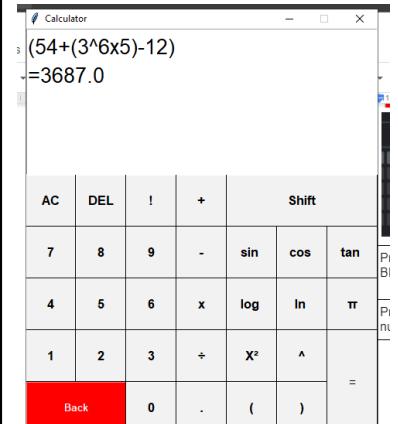
Program follows BEDMAS



Multiple brackets

Program follows
BEDMAS

Program follows
BEDMAS



Constants

Program can use numerical constants

Program can use numerical constants

