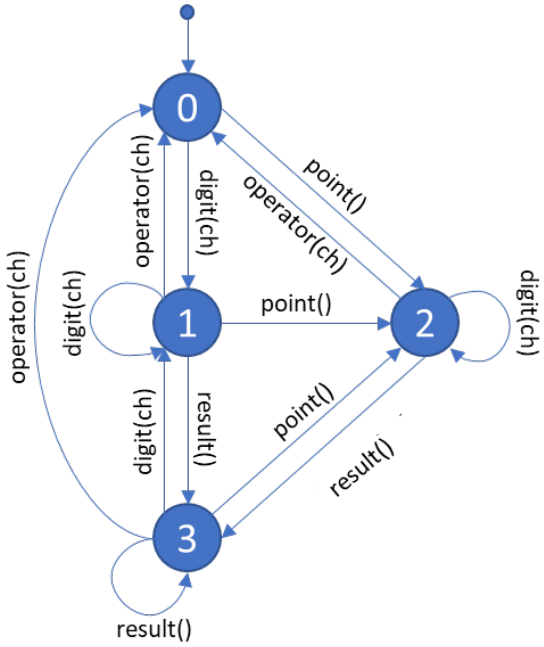
Solution

States graph and states table



Event	State			
	0	1	2	3
$digit(ch)$	1	1	2	1
$point()$	2	2	ANA	2
$operator(ch)$	ANA	0	0	0
$result()$	ANA	3	3	3
$reset()$	0	0	0	0
$display()$	0	1	2	3

State	Description
0	Initial state or, the calculator has received an operator
1	Calculator is receiving the integer part of a number
2	Calculator is receiving the decimal part of a number
3	An expression has been evaluated

Data status and initial values

1. Calculator value (real): $value$, initially 0
2. A string of characters $display$, initially "0".
3. Last arithmetic operator received, initially '+'
4. Last real value x received digit by digit, initially 0

Table of actions

Event	0	1	2	3
$digit(ch)$	$display = "ch"$	**if** $display = "0"$ **then** $display = "ch"$ **else** $display += "ch"$	**if** $display = "0"$ **then** $display = "ch"$ **else** $display += "ch"$	$value = 0$ $display = "ch"$
$point()$	$display = "0."$	$display += "."$	ANA	$value = 0$ $display = "0,"$
$display()$	$\rightarrow display$	$\rightarrow display$	$\rightarrow display$	$\rightarrow display$
$operator(ch)$	ANA	$x = \text{Real}(display)$ $value = value\ op\ x$ $display = String(value)$ $op = ch$	$x = \text{Real}(display)$ $value = value\ op\ x$ $display = String(value)$ $op = ch$	$op = ch$
$result()$	ANA	$x = Real(display)$ $value = value\ op\ x$ $display = String(value)$	$x = \text{Real}(display)$ $value = value\ op\ x$ $display = String(value)$	$value = value\ op\ x$ $display = String(value)$
$reset()$	$value = 0$ $display = "0"$ $op = '+'$ $x = 0$	$value = 0$ $display = "0"$ $op = '+'$ $x = 0$	$value = 0$ $display = "0"$ $op = '+'$ $x = 0$	$value = 0$ $display = "0"$ $op = '+'$ $x = 0$

$$(2.1 + 3)/2 - 5.75 + 0.2 + 0.2 + 0.2 - 1$$

Trace

Events	*state*	*value*	*op*	*display*	*x*
Initially	0	0	'+'	"0"	0
digit('2')	1	0	'+'	"2"	0
point()	2	0	'+'	"2,"	0
digit('1')	2	0	'+'	"2.1"	0
operator('+')	0	2.1	'+'	"2.1"	2.1
digit('3')	1	2.1	'+'	"3"	2.1
operator('/')	0	5.1	'/'	"5.1"	3
digit('2')	1	5.1	'/'	"2"	3
operator('-')	0	2.55	'-'	"2.55"	2
digit('5')	1	2.55	'-'	"5"	2
point()	2	2.55	'-'	"5."	2
digit('7')	2	2.55	'-'	"5.7"	2
digit('5')	2	2.55	'-'	"5.75"	2
operator('+')	0	-3.2	'+'	"-3.2"	5.75
point()	2	-3.2	'+'	"0."	5.75
digit('2')	2	-3.2	'+'	"0.2"	5.75
result()	3	-3	'+'	"-3.0"	0.2
result()	3	-2.8	'+'	"-2.8"	0.2
result()	3	-2.6	'+'	"-2.6"	0.2
operator('-')	0	-2.6	'-'	"-2.6"	0.2
digit('1')	1	-2.6	'-'	"1"	0.2
result()	3	-3.6	'-'	"-3.6"	1
display()	3	-3.6	'-'	→ "-3.6"	1