

```

1  /* Keypad.h - function prototypes and declarations for the c implemetation file
2  *
3  *      Copyright 2020 Graeme Judge, Sean Berkvens
4  *      Change Log:
5  *          May 3, 2020: Source file created
6  */
7
8  #include "stm32l476xx.h"
9
10 //defined values
11 #define DEBOUNCETIME 3
12
13 #define COL1  0x2C
14 #define COL2  0x2A
15 #define COL3  0x26
16 #define COL4  0xE
17
18 #define START  0b11110111
19
20 #define ROW4  0b1110
21 #define ROW3  0b1101
22 #define ROW2  0b1011
23 #define ROW1  0b0111
24
25
26
27 enum Keys {
28     Key_None = -1,
29     Key_1,
30     Key_2,
31     Key_3,
32     Key_A,
33     Key_4,
34     Key_5,
35     Key_6,
36     Key_B,
37     Key_7,
38     Key_8,
39     Key_9,
40     Key_C,
41     Key_Star,
42     Key_0,
43     Key_Pound,
44     Key_D
45 };
46
47 static enum Keys Matrix[4][4] = {{Key_1, Key_2, Key_3, Key_A},
48                                  {Key_4, Key_5, Key_6, Key_B},
49                                  {Key_7, Key_8, Key_9, Key_C},
50                                  {Key_Star, Key_0, Key_Pound, Key_D}};
51
52
53 /*
54     void GPIOInit;
55
56     initializes the gpio ports as needed for the input and the outout for
57     the program to function properly
58
59     Input: None
60     Output: None
61 */
62 void GPIOInit();
63
64 /*
65     void GPIOInitRow;
66
67     initializes the gpio ports as needed for the row outout for
68     the program to function properly
69
70     Input: None
71     Output: None
72 */

```

```
73 void GPIOInitRow(void);
74
75 /*
76 void GPIOInitCol;
77
78 initializes the gpio ports as needed for the input for
79 the program to function properly
80
81 Input: None
82 Output: None
83 */
84 void GPIOInitCol(void);
85
86 /*
87 void scan;
88
89 scans the keypad and returns the key thats being pressed
90
91 Input: None
92 Output: The pressed key as defined in the Keys struct
93 */
94 enum Keys scan(void);
95
96 /*
97 void getInput;
98
99 Gets the input form the port
100
101 Input: None
102 Output: the lowest 8 bits from the input port
103 */
104 uint8_t getInput(void);
105
106 /*
107 void debouncedKey;
108
109 gets the pressed key value and uses debounce to ensure the correct value
110
111 Input: None
112 Output: the bit pattern of the input port with debounce
113 */
114 uint8_t debouncedKey(void);
115
```