lab4_uart

1.0

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```
#include <stdint.h>
#include <stdbool.h>
#include <time.h>
#include <stdlib.h>
#include "user.h"
```

Macros

- #define NELEMS(x) (sizeof(x) / sizeof((x)[0]))

  Array length calculator.

Functions

- int32_t main (void)

  Bulls and Cows game.

2.2.1 Macro Definition Documentation

2.2.1.1 NELEMS

```
#define NELEMS(
              x ) (sizeof(x) / sizeof((x)[0]))
```

Array length calculator.

Software realization of delay function, using empty for cycle

Parameters

in	*x*	type of vars into array

Returns

array length

2.2.2 Function Documentation

2.2.2.1 main()

```
int32_t main (
            void  )
```

Bulls and Cows game.

the main program generate 4 random numbers, after that start to speak with player trough UART. Player enter 4 numbers too, if player trying to input NaN, programm tell him or her about error and number need to enter again. After that programm checks if random array and player array has the same numbers, count of cows will be increment, if this numbers has the same indexes, count of cows will be increment

2.3 D:/KPI/pic32/lab4.X/UART.c File Reference

```
#include "UART.h"
```

Functions

- void UART4_init (void)
  UART init function.
- char UART4_getc (void)
  getting char from PC
- void UART4_putc (char c)
- void UART4_puts (char ∗s)
  This funcktion send data to UART BUFFER.
- void UART4_test (void)

2.3.1 Function Documentation

2.3.1.1 UART4_getc()

```
char UART4_getc (
            void  )
```

getting char from PC

This function is reading char witch user sends from serial port and assign it to selected char symbol

Parameters

out	*value*	of U4RREG

Returns

Char symbol

2.3.1.2 UART4_init()

```
void UART4_init (
            void  )
```

UART init function.

initialization of UART

Parameters

NONE	

Returns

NONE

2.3.1.3 UART4_putc()

```
void UART4_putc (
            char c )
```

2.3.1.4 UART4_puts()

```
void UART4_puts (
            char * s )
```

This funcktion send data to UART BUFFER.

This function is read data from input string and send it to UART BUFFER

Parameters

in	*s	Input string value

Returns

NONE

2.3.1.5 UART4_test()

```
void UART4_test (
            void  )
```

2.4 D:/KPI/pic32/lab4.X/UART.h File Reference

```
#include <xc.h>
```

Functions

- void UART4_init (void)
  UART init function.
- char UART4_getc (void)
  getting char from PC
- void UART4_putc (char c)
- void UART4_puts (char *s)
  This funcktion send data to UART BUFFER.
- void UART4_test (void)

2.4.1 Function Documentation

2.4.1.1 UART4_getc()

```
char UART4_getc (
            void  )
```

getting char from PC

This function is reading char witch user sends from serial port and assign it to selected char symbol

Parameters

out	*value*	of U4RREG

Returns

Char symbol

2.4.1.2 UART4_init()

```
void UART4_init (
             void  )
```

UART init function.

Function prototype:

Summary:

Description:

Precondition:

Parameters:

Returns:

Example:

Remarks:

initialization of UART

Parameters

NONE	

Returns

NONE

2.4.1.3 UART4_putc()

```
void UART4_putc (
             char c )
```

2.4.1.4 UART4_puts()

```
void UART4_puts (
             char * s )
```

This funcktion send data to UART BUFFER.

This function is read data from input string and send it to UART BUFFER

Parameters

in	*s	Input string value

Returns

NONE

2.4.1.5 UART4_test()

```
void UART4_test (
            void  )
```

2.5 D:/KPI/pic32/lab4.X/user.c File Reference

```
#include <stdint.h>
#include <stdbool.h>
#include "user.h"
#include <sys/attribs.h>
```

Functions

- void InitGPIO (void)

  This function is using for setting GPIO.
- void InitApp (void)

  This function is using for setting all used devices.
- void Delay (uint32_t n)

  Delay function.

2.5.1 Function Documentation

2.5.1.1 Delay()

```
void Delay (
            uint32_t n )
```

Delay function.

Software realization of delay function, using empty for cycle

Parameters

in	*n*	The MAX count number

Returns

NONE

2.5.1.2 InitApp()

```
void InitApp (
             void  )
```

This function is using for setting all used devices.

This function is using for setting all used devices

Parameters

NONE	

Returns

NONE

2.5.1.3 InitGPIO()

```
void InitGPIO (
             void  )
```

This function is using for setting GPIO.

This function is setting LED's 1-4 to digital work mode and output And set BTN's 1-2 to Digital input mode

Parameters

NONE	

Returns

NONE

2.6 D:/KPI/pic32/lab4.X/user.h File Reference

Macros

- #define LD1_PORT_BIT LATGbits.LATG6
- #define LD2_PORT_BIT LATDbits.LATD4
- #define LD3_PORT_BIT LATBbits.LATB11
- #define LD4_PORT_BIT LATGbits.LATG15
- #define BTN1_PORT_BIT PORTAbits.RA5
- #define BTN2_PORT_BIT PORTAbits.RA4

Functions

- void InitApp (void)

  This function is using for setting all used devices.
- void Delay (uint32_t)

  Delay function.

2.6.1 Macro Definition Documentation

2.6.1.1 BTN1_PORT_BIT

```
#define BTN1_PORT_BIT PORTAbits.RA5
```

Definig constants for port bits operations

2.6.1.2 BTN2_PORT_BIT

```
#define BTN2_PORT_BIT PORTAbits.RA4
```

Definig constants for port bits operations

2.6.1.3 LD1_PORT_BIT

```
#define LD1_PORT_BIT LATGbits.LATG6
```

Definig constants for port bits operations

2.6.1.4 LD2_PORT_BIT

```
#define LD2_PORT_BIT LATDbits.LATD4
```

Definig constants for port bits operations

2.6.1.5 LD3_PORT_BIT

```
#define LD3_PORT_BIT LATBbits.LATB11
```

Definig constants for port bits operations

2.6.1.6 LD4_PORT_BIT

```
#define LD4_PORT_BIT LATGbits.LATG15
```

Definig constants for port bits operations

2.6.2 Function Documentation

2.6.2.1 Delay()

```
void Delay (
            uint32_t n )
```

Delay function.

Software realization of delay function, using empty for cycle

Parameters

in	*n*	The MAX count number

Returns

NONE

2.6.2.2 InitApp()

```
void InitApp (
            void  )
```

This function is using for setting all used devices.

This function is using for setting all used devices

Parameters

NONE	

Returns

NONE

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