

Keywords (32)

auto	double	int	struct
break	else	long	switch
case	enum	register	typedef
char	extern	return	union
const	float	short	unsigned
continue	for	signed	void
default	goto	sizeof	volatile
do	if	static	while

Single Operand Operators (8)

+	&	--	++
*	!	~	-

Double Operand Operators (32)

+	&	=	+=
-=	*=	/=	%=
&=	^=	=	<<=
>>=	^		,
/	==	>=	>
*	!=	<<	<=
<	&&		%
>>	.	->	-

Triple Operand Operators (1)

? :

Main Function, Statements, Blocks, Arrays, Arguments, Comments (7)

```
main
;
{}
[]
()
/* Comment can be many lines */
// Comment until the end of the line
```

Constants & Variables (9)

```
100
0653
0xA45D
-45.793
3.14E-2
'c'
\n
"This is a string"
CamelCaseVariableName
```

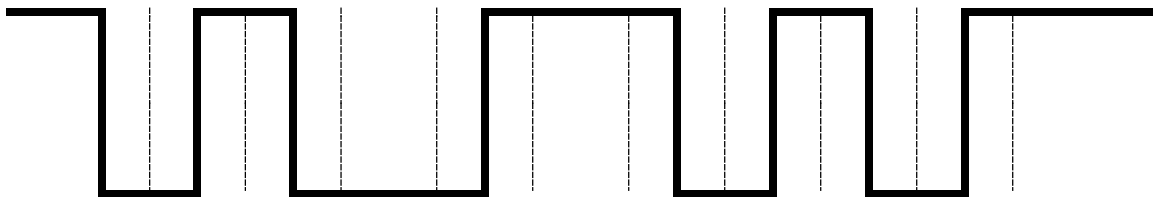
Preprocessor (12)

#define	#elif	#else	#endif
#error	#if	#ifdef	#ifndef
#include	#line	#pragma	#undef

ASCII Code Chart

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	SOH	STX	ETX	EOT	ENQ	ACK	BEL	BS	HT	LF	VT	FF	CR	SO	SI
1	DLE	DC1	DC2	DC3	DC4	NAK	SYN	ETB	CAN	EM	SUB	ESC	FS	GS	RS	US
2		!	"	#	\$	%	&	'	()	*	+	,	-	.	/
3	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5	P	Q	R	S	T	U	V	W	X	Y	Z	[\]	^	_
6	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
7	p	q	r	s	t	u	v	w	x	y	z	{		}	~	DEL

The waveform shown below is for an asynchronous serial data link configured for 19.2Kbps, 8 data bits, no parity, 1 stop bit. The dashed lines indicate the data sample points at the receiver.



- Identify the start bit.
- Identify the stop bit.
- Identify the least significant bit (lsb) of the data.
- Identify the most significant bit (msb) of the data.
- What is value of the data being transmitted, in hexadecimal?
- Show the calculations to determine the maximum data rate in bits per second and characters per second.
- If the serial link were configured for odd parity, would the parity bit be set to 0 or 1 for the 8-bit data shown above?

- What do UART and USART stand for?

UART:

USART:

- What signal accompanies the data line in a synchronous serial link?
- What is the hexadecimal value of the ASCII representation of the following characters:

'U':

'S':

'D':

'!':

List the nine potential sections of a well-structured embedded C module in the order in which they should appear:

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.

What are the six potential elements of a state machine?

1.

2.

3.

4.

5.

6.

- If a peripheral requires more attention than is possible via polling its status, what technique can be used to service it?
- What is the name of the signal a peripheral uses to asynchronously get the attention of the CPU?
- What is the name of the special function that gets called when a peripheral asynchronously signals the CPU?

- Where is the address of the special function in the previous question stored?
- What are the names used to describe the code that runs synchronously and the code that runs asynchronously?
- A GPIO signals that controls an LED is "active low." Explain what that term means.
- Explain the trade-offs that must be considered when deciding the tick timer period. In other words, what are the pros and cons of making it shorter and what are the pros and cons of making it longer?

- Write the complete code for a module named *blink.c* that contains the single function `BlinkClock()` that, when "clocked" (called) every 10 msec, will repeatedly blink an LED on for 100 msec and off for 900 msec. Assume that two macros, `LED_ON()` and `LED_OFF()` have already been defined in the module *led.c* with its associated header file, *led.h*. Since the function `BlinkClock()` stands on its own (there are no helper functions associated with its states), all of its variables should be declared within the function.