

- Resume . Run the program
- Terminate . Stop the program
- Suspend . Pause execution
- Step into Step into a function
- Step over Step over to next line
- Step out Step out of a function
- Restart Restart execution of program

MSP430

- Runs in little Endian
 - ↳ most significant byte is stored at the highest address of the storage register.
- 8kB of RAM
- 128kB Flash
- 25 MHz MCU

Signed

Min: $-1 \times 2^{N-1}$
Max: $2^{N-1} - 1$

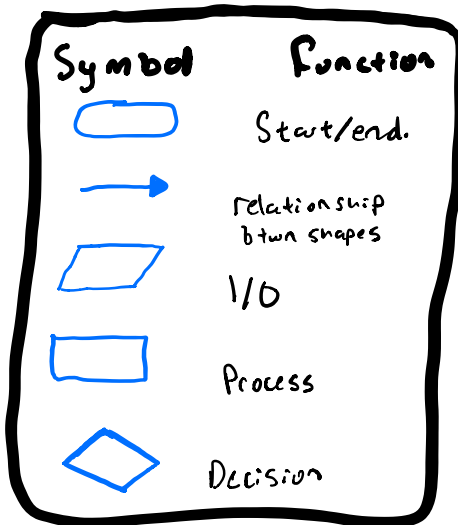
Unsigned

Min: 0
Max: $2^N - 1$

- Where N is # of bits
- 8 bits in a byte

- Change heap size to 300 for printf to work.
- Optimization level turn off.
- Silicon version \rightarrow MSP
- Data Memory Model \rightarrow Small, have instructions set to non-extended instructions.
- Break point \rightarrow essentially a pause in the program such that the user is able to see what is happening in the code.

	Size (bytes)		Size (in bytes)		Size (bytes)
char	1	unsigned char	1	double	8
short int	2	unsigned short int	2	float	4
int	4	unsigned int	4		
long int	8	unsigned long int	8		
long long int	16	unsigned long long int	16		



Char	1	unsigned int	4
Short int	2	unsigned short	2
int	4	unsigned	4
long int	8	unsigned long	8
long long int	16	unsigned long long	16
Float	4	double	8

Convert -3460 to binary, hex, and octal

$$3460/2 = 0$$

$$1730/2 = 0$$

$$865/2 = 1$$

$$432/2 = 0$$

$$216/2 = 0$$

$$108/2 = 0$$

$$54/2 = 0$$

$$27/2 = 1$$

$$13/2 = 1$$

$$6/2 = 0$$

$$3/2 = 1$$

$$1/2 = 0$$

0000 0101 1000 0100
1111 1010 0111 1011

+ 1

1111 1010 0111 1100

F A 7 C

F 2 7 C

6604

0000 0

0001 1

0010 2

0011 3

0100 4

0101 5

0110 6

0111 7

1000 8

1001 9

1010 A

1011 B

1100 C

1101 D

1110 E

1111 F

$$3460/8 = R4$$

$$432/8 = R0$$

$$54/8 = R6$$

$$6/8 = R0$$

$$0/8 = R0$$

• Convert 12,212 to binary, hex, and Octal

$$12,212/2 = 0$$

$$6106/2 = 0$$

$$3053/2 = 1$$

$$1526/2 = 0$$

$$763/2 = 1$$

$$381/2 = 1$$

$$190/2 = 0$$

$$95/2 = 1$$

$$47/2 = 1$$

$$23/2 = 1$$

$$11/2 = 1$$

$$5/2 = 1$$

$$2/2 = 0$$

$$1/2 = 1$$

0010 1111 1011 0100 Binary

2 F B 7 hex

2 7664 Octal

0000 0

0001 1

0010 2

0011 3

0100 4

0101 5

0110 6

0111 7

1000 8

1001 9

1010 A

1011 B

1100 C

1101 D

1110 E

1111 F

$$12212/8 = R4$$

$$1526/8 = R6$$

$$190/8 = R6$$

$$23/8 = R7$$

$$2/8 = 2$$

$$0/8 = R0$$