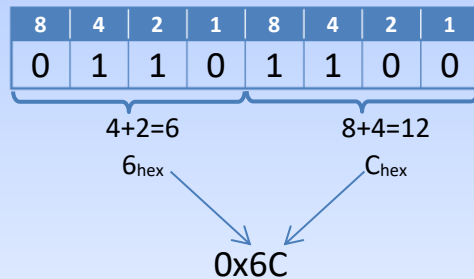


# Bit Manipulation Cheat Sheet

## Hexadecimal

Digits: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F



## Positions and Masks

Bit	7	6	5	4	3	2	1	0
Name	CMODE	PMODE	SBMODE	CHSIZE				

**SBMODE** Stop Bits 1 Stop Bit / 2 Stop Bits  
**PMODE** Parity Mode Disabled 00, Even 01, Odd: 11

SPMODE: `_bp` (Bit Position) = 3, `_bm` (Bit Mask) = 0000 1000 = 0x08

PMODE: `_gp` (Group Position) = 4, `_gm` (Group Mask) = 0011 0000 = 0x30  
`_gc` (Group Configuration): 0000 0000, 0001 0000, 0011 0000

## Individual Bit

### Query

```
if (REG & BIT_bm) { ... }  
if (!(REG & BIT_bm)) { ... }
```

### Modify

#### Set

```
REG |= BIT_bm;  
REG |= (BIT_bm | BIT_bm | ...);
```

#### Delete

```
REG &= ~BIT_bm;
```

#### Change

```
REG ^= BIT_bm;
```

## Bit Groups

### Query

```
if ((REG & GROUP_gm) == GROUP_gc) { ... };
```

### Change

```
REG = (REG & ~GROUP_gm) | GROUP_gc;
```

### Assign

```
REG = (REG & ~GROUP_gm) | (value << GROUP_gp)
```