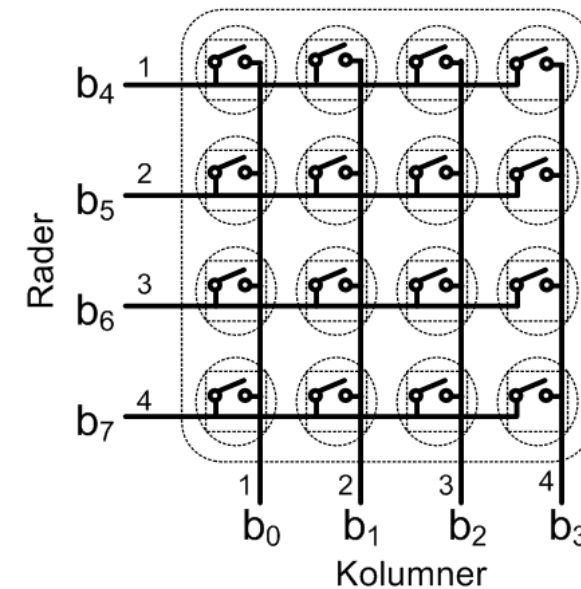


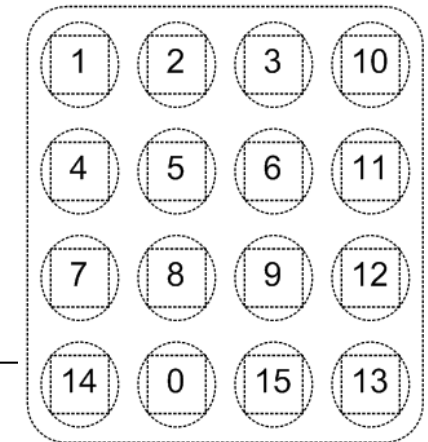
Hjälpfunktioner: kbdActivate och kbdGetCol

```
void kbdActivate( unsigned int row )
{ /* Aktivera angiven rad hos tangentbordet, eller
   * deaktivera samtliga */
  switch( row )
  {
    case 1: *GPIO_ODR_HIGH = 0x10; break;
    case 2: *GPIO_ODR_HIGH = 0x20; break;
    case 3: *GPIO_ODR_HIGH = 0x40; break;
    case 4: *GPIO_ODR_HIGH = 0x80; break;
    case 0: *GPIO_ODR_HIGH = 0x00; break;
  }
}
```

```
int kbdGetCol ( void )
{ /* Om någon tangent (i aktiverad rad)
   * är nedtryckt, returnera dess kolumnnummer,
   * annars, returnera 0 */
  unsigned char c;
  c = *GPIO_IDR_HIGH;
  if ( c & 0x8 ) return 4;
  if ( c & 0x4 ) return 3;
  if ( c & 0x2 ) return 2;
  if ( c & 0x1 ) return 1;
  return 0;
}
```



Funktionen keyb



```
unsigned char keyb(void)
{
    unsigned char key[]={1,2,3,0xA,4,5,6,0xB,7,8,9,0xC,0xE,0,0xF,0xD};
    int row, col;
    for (row=1; row <=4 ; row++ ) {
        kbdActivate( row );
        if( (col = kbdGetCol () ) )
        {
            kbdActivate( 0 );
            return key [4*(row-1)+(col-1) ];
        }
    }
    kbdActivate( 0 );
    return 0xFF;
}
```

GPIO – Algoritm för initiering

Initiering av GPIO-port

SetPortMODER:

if(mode_have_input_pins)

SetPUPDregister

if(mode_has_output_pins)

SetOTYPER

SetOSPEEDR

if(all_port_pins)

*GPIO_xxx = ...

else (only_specific_port_pins)

*GPIO &= ~ specific_port_pins

//Clear all specific port pins

*GPIO |= specific_port_pins

// set according