

Arduino實作三:模擬電子計 質機

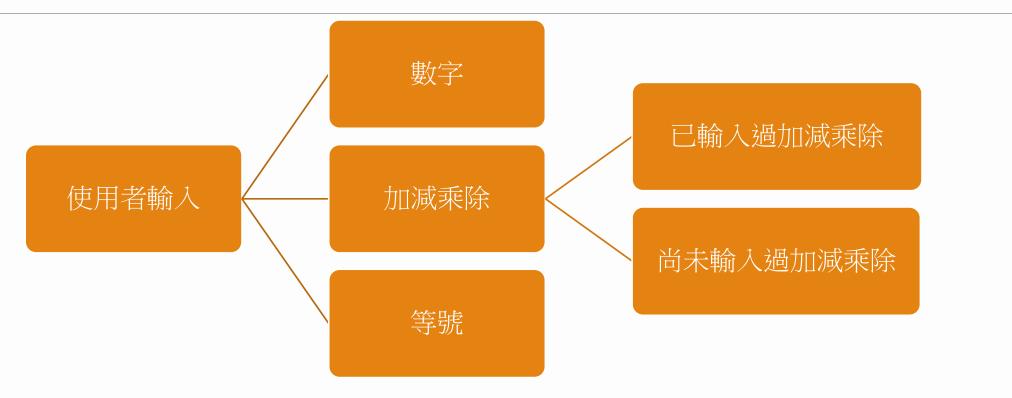


練習一:用Arduino製作簡易計算機





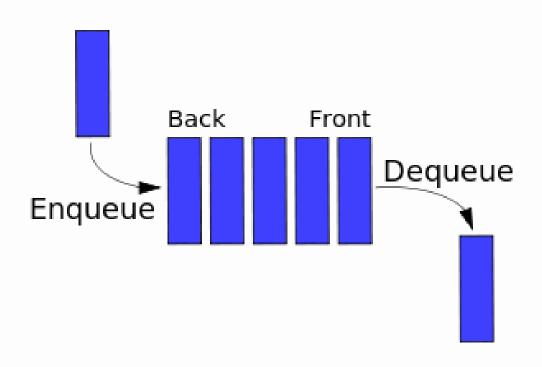
討論輸入的可能性



考慮需要使用的暫存變數,例如:畫面顯示的值、運算子、暫存數字等。 並思考各種情況時該如何操作。

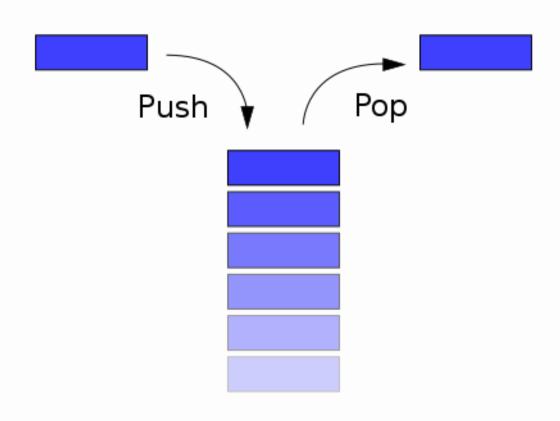


佇列(queue)





堆疊(stack)



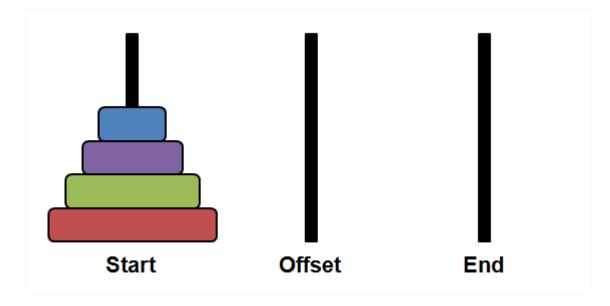


Stack應用—管理記憶體

| writable; not executable | Stack | Managed "automatically" (by compiler) |
|---------------------------|------------------------|---------------------------------------|
| | + | |
| writable; not executable | Dynamic Data (Heap) | Managed by programmer |
| writable; not executable | Static Data | Initialized when process starts |
| Read-only; not executable | Literals | Initialized when process starts |
| Read-only; executable | Instructions | Initialized when process starts |



Stack應用—河內塔



中序式(infix) v.s. 後序式(postfix)TUEE

- 中序式:平常書寫的加減乘除形式,適合人眼閱讀但不適合程式解讀。EX: 2-1*3+5
- 後序式:先寫數字再寫運算子,由於是完全的由左而右的進行計算,對程式來說容易計算。EX:用中序式表示為8-2*3的計算,後序式則寫做823*-。
- ●中序式→後序式轉換練習:
- 1.7*8-2*4 2.9-2-2+5 3.8*(4-2)+5*4



使用stack解決Infix → postfix轉換EE

Algorithm for Conversion Of An Expression From Infix to Postfix

```
Consider -
    Stack S
    Char ch
    Char element
while(Tokens are Available)
     ch = Read(Token);
     if(ch is Operand)
       Print ch ;
     else
       while(Priority(ch) <= Priority(Top Most Stack))</pre>
            element = Pop(S);
            Print(ele);
       Push(S,ch);
while(!Empty(S))
element = Pop(S);
Print(ele);
```



練習二: 進階版計算機

- 使用按鍵板輸入完整的式子,不包含括號。EX: 1+2*3
- 輸入等號後將式子轉換成後序式(postfix)並計算出結果。