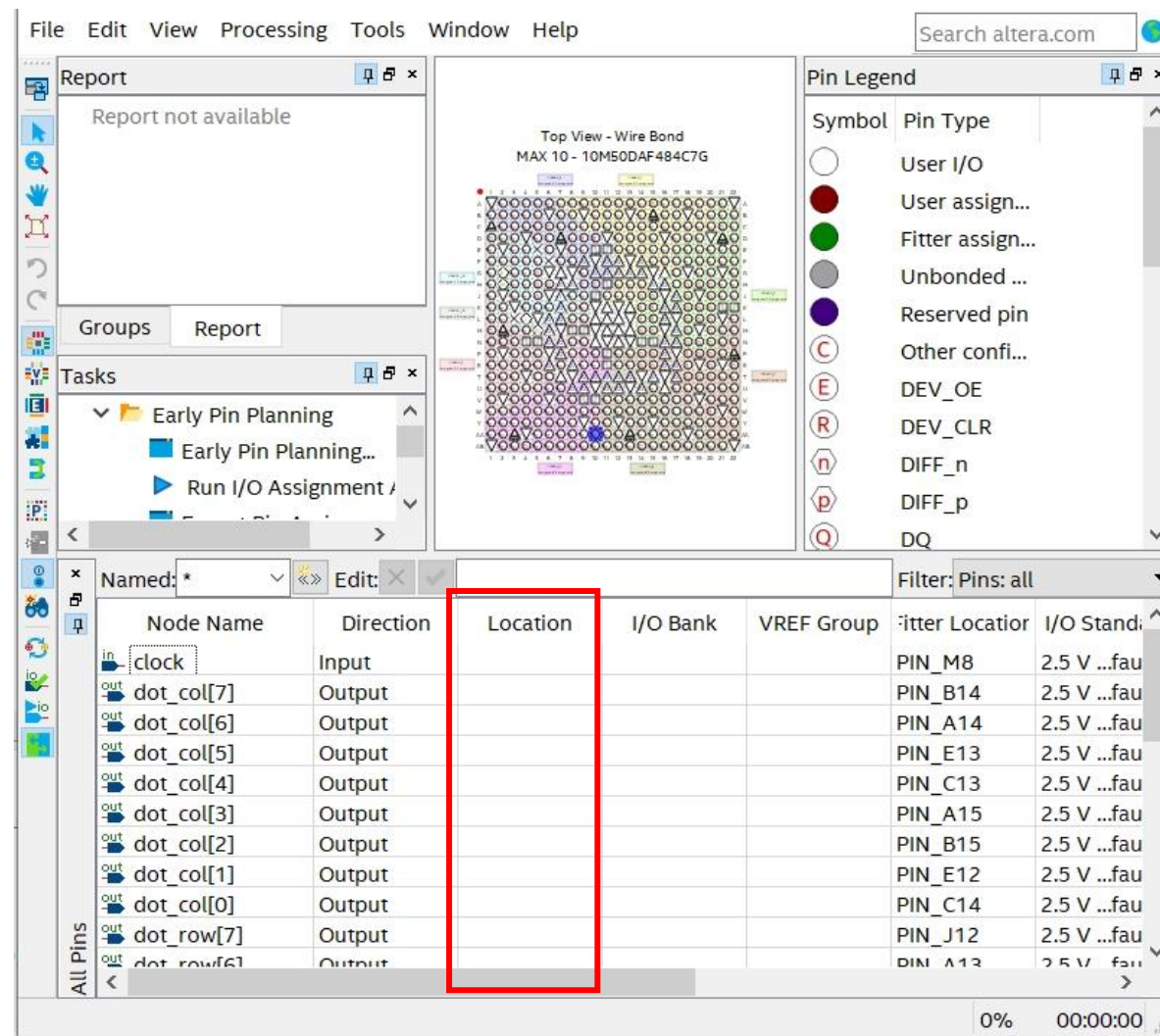
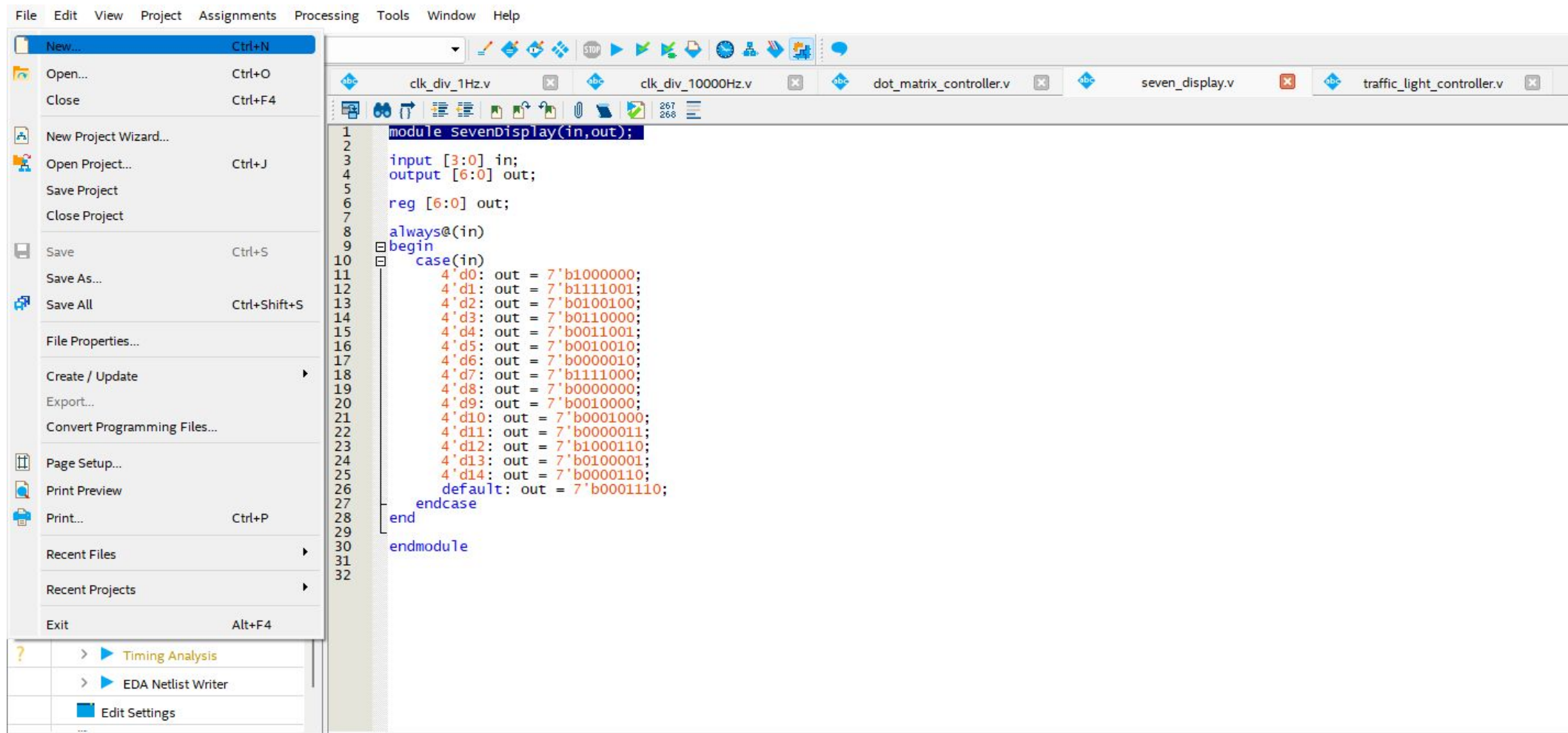


# Auto Pin Plan on quartus

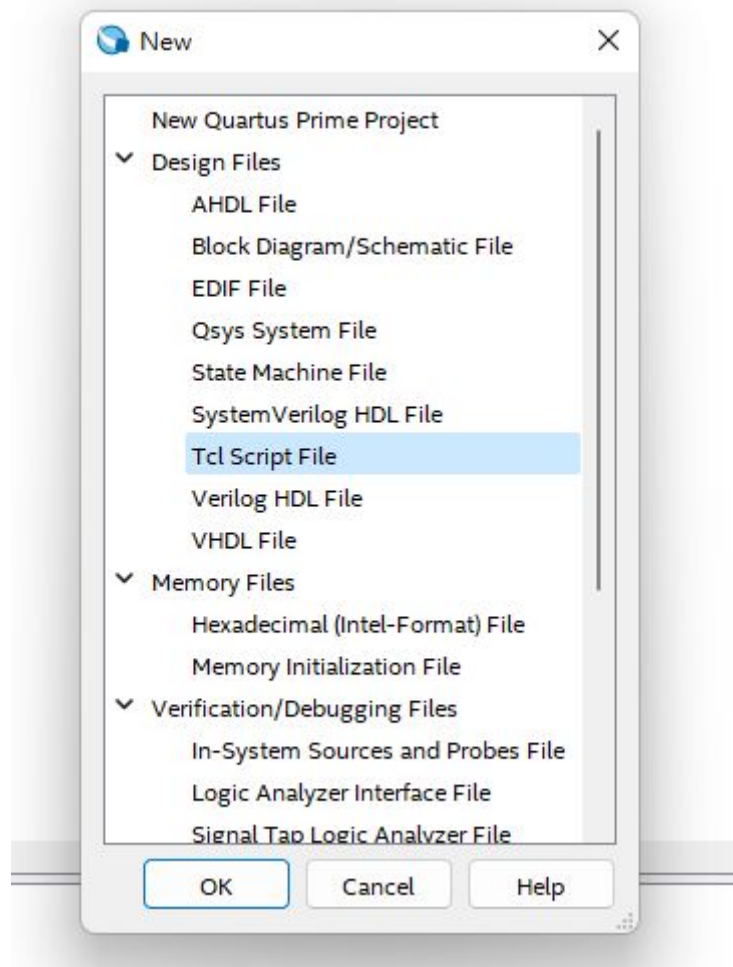
DICLAB



過去的lab中，會需要同學手動輸入Pin腳位



實務上，Quartus有提供 tcl file 執行 tcl command



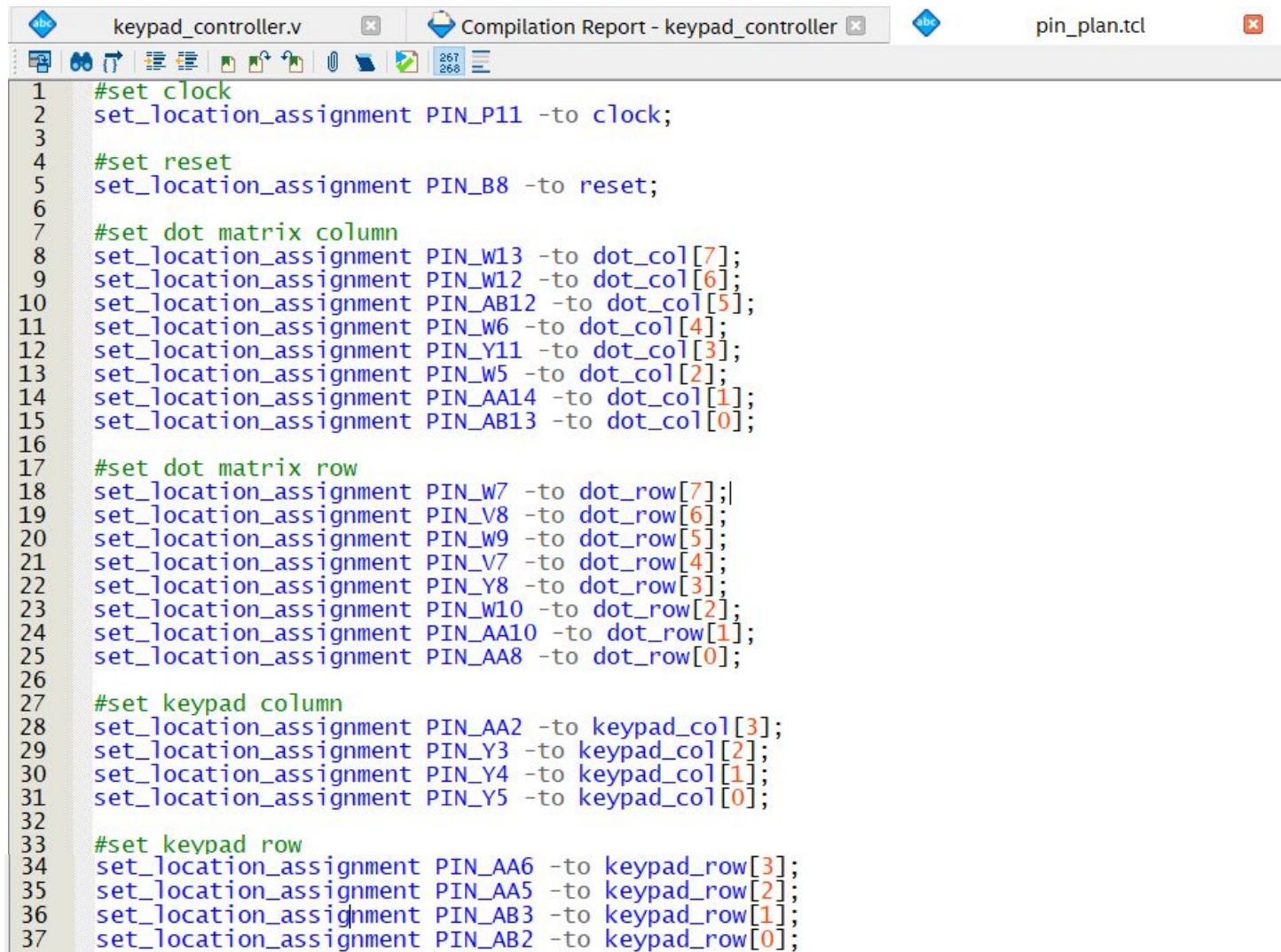
新增 Tcl script 到 Project 中

```
1  #set clock
2  set_location_assignment PIN_P11 -to clock;
3
4  #set reset
5  set_location_assignment PIN_B8 -to reset;
6
7  #set dot matrix column
8  set_location_assignment PIN_W13 -to dot_col[7];
9  set_location_assignment PIN_W12 -to dot_col[6];
10 set_location_assignment PIN_AB12 -to dot_col[5];
11 set_location_assignment PIN_W6 -to dot_col[4];
12 set_location_assignment PIN_Y11 -to dot_col[3];
13 set_location_assignment PIN_W5 -to dot_col[2];
14 set_location_assignment PIN_AA14 -to dot_col[1];
15 set_location_assignment PIN_AB13 -to dot_col[0];
16
17 #set dot matrix row
18 set_location_assignment PIN_W7 -to dot_row[7];
19 set_location_assignment PIN_V8 -to dot_row[6];
20 set_location_assignment PIN_W9 -to dot_row[5];
21 set_location_assignment PIN_V7 -to dot_row[4];
22 set_location_assignment PIN_Y8 -to dot_row[3];
23 set_location_assignment PIN_W10 -to dot_row[2];
24 set_location_assignment PIN_AA10 -to dot_row[1];
25 set_location_assignment PIN_AA8 -to dot_row[0];
```

就可以開始撰寫想要的Tcl command

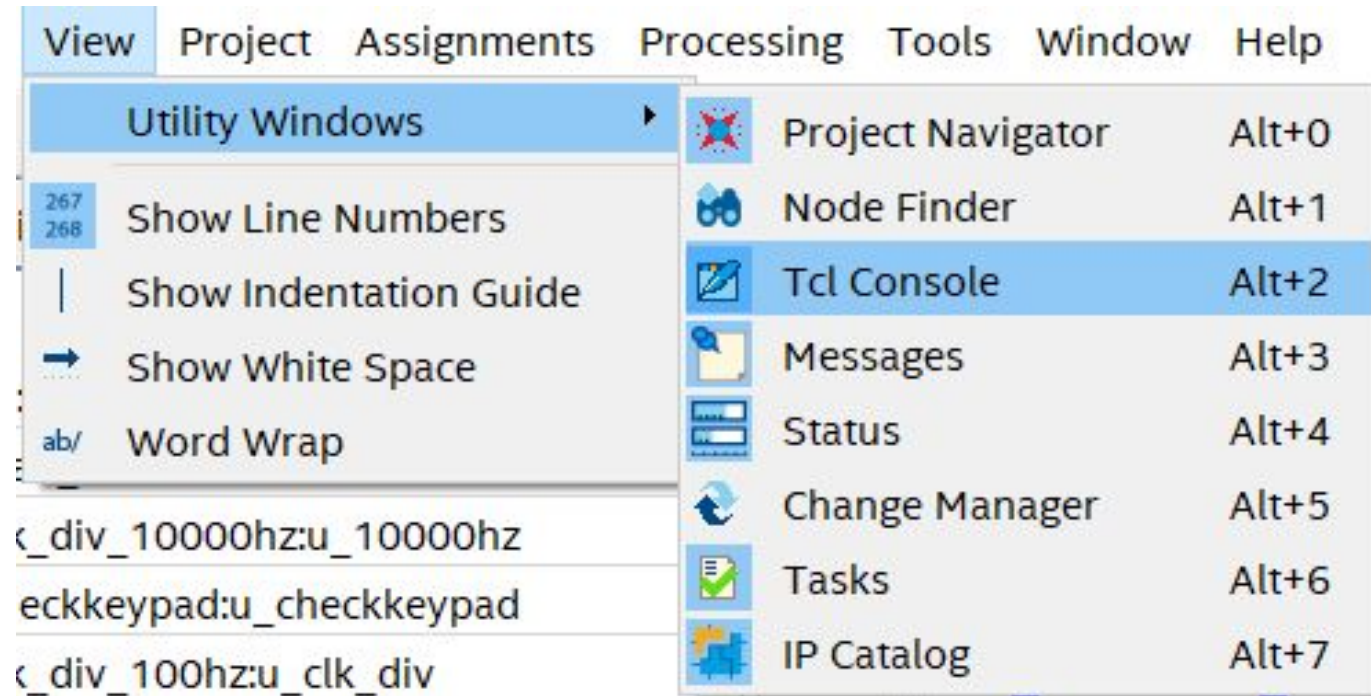
因此可以針對已知的Pin腳位寫上location

例如: dot matrix很多project都會用到, 寫一次、寫到一個檔案就好



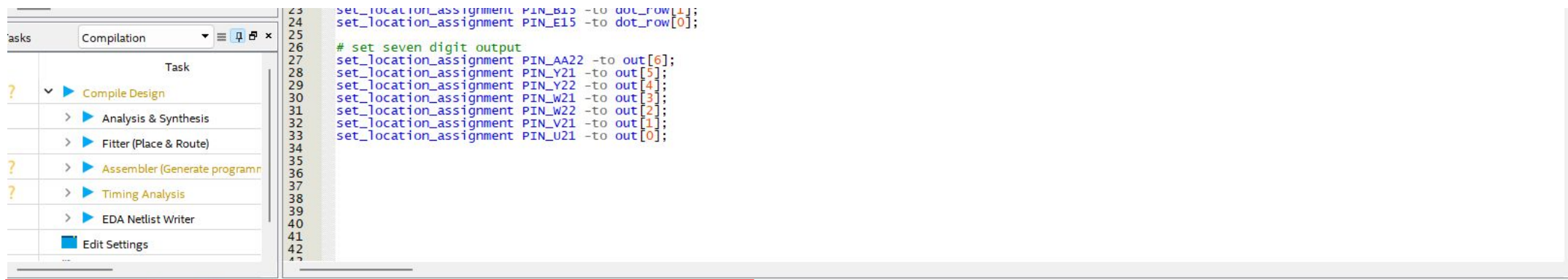
```
1 #set clock
2 set_location_assignment PIN_P11 -to clock;
3
4 #set reset
5 set_location_assignment PIN_B8 -to reset;
6
7 #set dot matrix column
8 set_location_assignment PIN_W13 -to dot_col[7];
9 set_location_assignment PIN_W12 -to dot_col[6];
10 set_location_assignment PIN_AB12 -to dot_col[5];
11 set_location_assignment PIN_W6 -to dot_col[4];
12 set_location_assignment PIN_Y11 -to dot_col[3];
13 set_location_assignment PIN_W5 -to dot_col[2];
14 set_location_assignment PIN_AA14 -to dot_col[1];
15 set_location_assignment PIN_AB13 -to dot_col[0];
16
17 #set dot matrix row
18 set_location_assignment PIN_W7 -to dot_row[7];
19 set_location_assignment PIN_V8 -to dot_row[6];
20 set_location_assignment PIN_W9 -to dot_row[5];
21 set_location_assignment PIN_V7 -to dot_row[4];
22 set_location_assignment PIN_Y8 -to dot_row[3];
23 set_location_assignment PIN_W10 -to dot_row[2];
24 set_location_assignment PIN_AA10 -to dot_row[1];
25 set_location_assignment PIN_AA8 -to dot_row[0];
26
27 #set keypad column
28 set_location_assignment PIN_AA2 -to keypad_col[3];
29 set_location_assignment PIN_Y3 -to keypad_col[2];
30 set_location_assignment PIN_Y4 -to keypad_col[1];
31 set_location_assignment PIN_Y5 -to keypad_col[0];
32
33 #set keypad row
34 set_location_assignment PIN_AA6 -to keypad_row[3];
35 set_location_assignment PIN_AA5 -to keypad_row[2];
36 set_location_assignment PIN_AB3 -to keypad_row[1];
37 set_location_assignment PIN_AB2 -to keypad_row[0];
```

以KeyPad controller lab 為例的 TCL file



把pin\_plan存檔後

View -> Utility Windows -> Tcl Console



The screenshot shows the Quartus Prime IDE. On the left, the 'Tasks' window is open, displaying a list of tasks under the 'Compilation' category. The tasks include 'Compile Design', 'Analysis & Synthesis', 'Fitter (Place & Route)', 'Assembler (Generate program)', 'Timing Analysis', 'EDA Netlist Writer', and 'Edit Settings'. On the right, a Tcl script is visible, showing commands for setting location assignments and output locations. The script includes comments and commands like `set_location_assignment PIN_B15 -to out_row[1];` and `set_location_assignment PIN_E15 -to out_row[0];`.

```
23 set_location_assignment PIN_B15 -to out_row[1];
24 set_location_assignment PIN_E15 -to out_row[0];
25
26 # set seven digit output
27 set_location_assignment PIN_AA22 -to out[6];
28 set_location_assignment PIN_Y21 -to out[5];
29 set_location_assignment PIN_Y22 -to out[4];
30 set_location_assignment PIN_W21 -to out[3];
31 set_location_assignment PIN_W22 -to out[2];
32 set_location_assignment PIN_V21 -to out[1];
33 set_location_assignment PIN_U21 -to out[0];
34
35
36
37
38
39
40
41
42
43
```



存檔成“pin\_plan.tcl”後，使用source執行它，  
就可以節省很多時間

File Edit View Processing Tools Window Help

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Report

Report not available

Groups Report

Tasks

- Early Pin Planning
  - Early Pin Planning...
  - Run I/O Assignment /
  - Export Pin Assignment

Top View - Wire Bond  
MAX 10 - 10M50DAF484C7G

Pin Legend

Symbol	Pin Type
○	User I/O
●	User assign...
●	Fitter assign...
●	Unbonded ...
●	Reserved pin
○	Other confi...
○	DEV_OE
○	DEV_CLR
○	DIFF_n
○	DIFF_p
○	DQ
○	DQS
○	DQSB

Named: \* Edit: X

Filter: Pins: all

Node Name	Direction	Location	I/O Bank	VREF Group	Fitter Location	I/O Stand
in clock	Input	PIN_P11	3	B3_NO	PIN_P11	2.5 V
out dot_col[7]	Output	PIN_W13	4	B4_NO	PIN_W13	2.5 V
out dot_col[6]	Output	PIN_W12	4	B4_NO	PIN_W12	2.5 V
out dot_col[5]	Output	PIN_AB12	4	B4_NO	PIN_AB12	2.5 V
out dot_col[4]	Output	PIN_W6	3	B3_NO	PIN_W6	2.5 V
out dot_col[3]	Output	PIN_Y11	4	B4_NO	PIN_Y11	2.5 V
out dot_col[2]	Output	PIN_W5	3	B3_NO	PIN_W5	2.5 V
out dot_col[1]	Output	PIN_AA14	4	B4_NO	PIN_AA14	2.5 V

100% 00:00:23

再開啟pin planner檢查腳位，即可完成工作