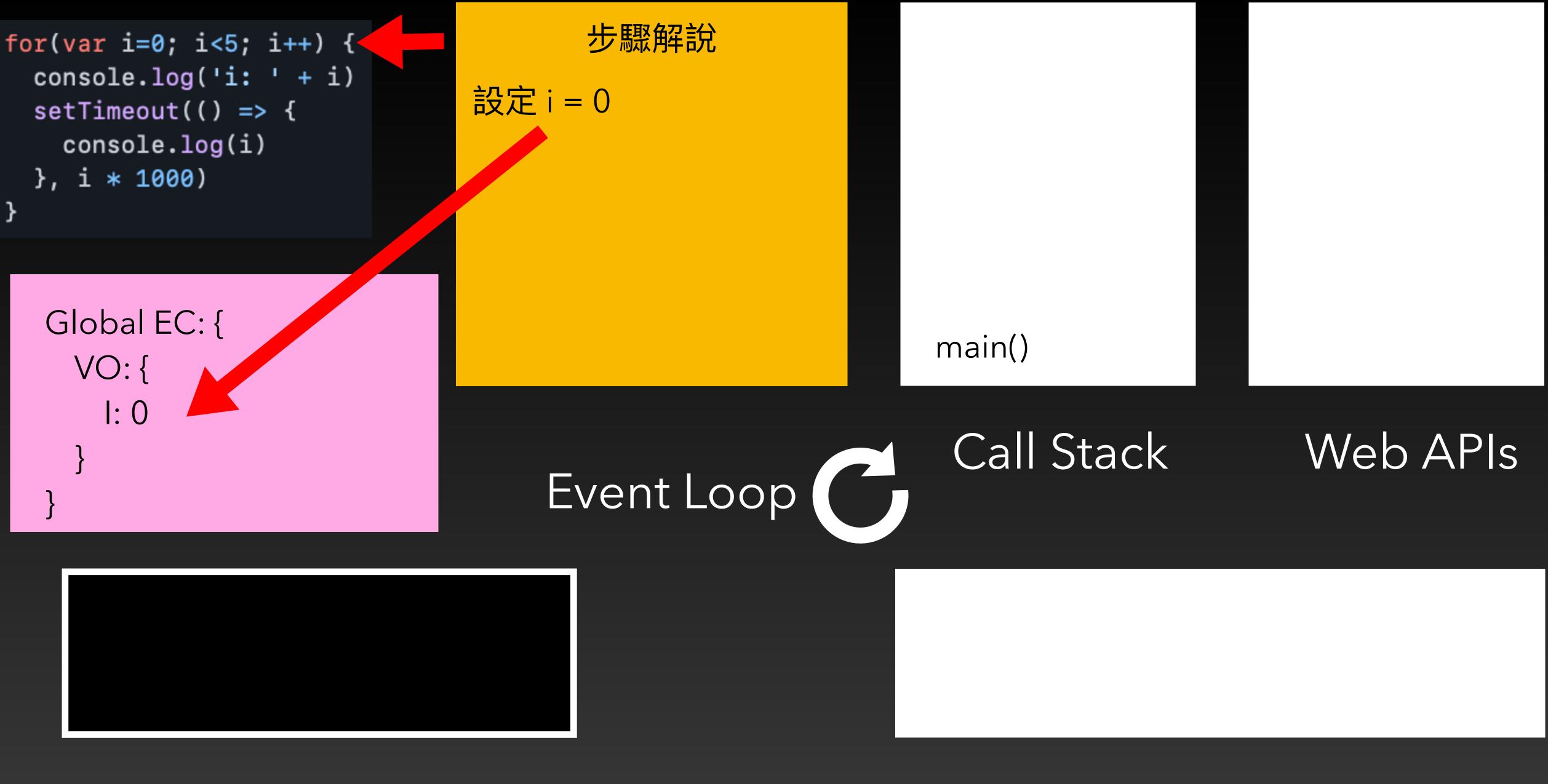
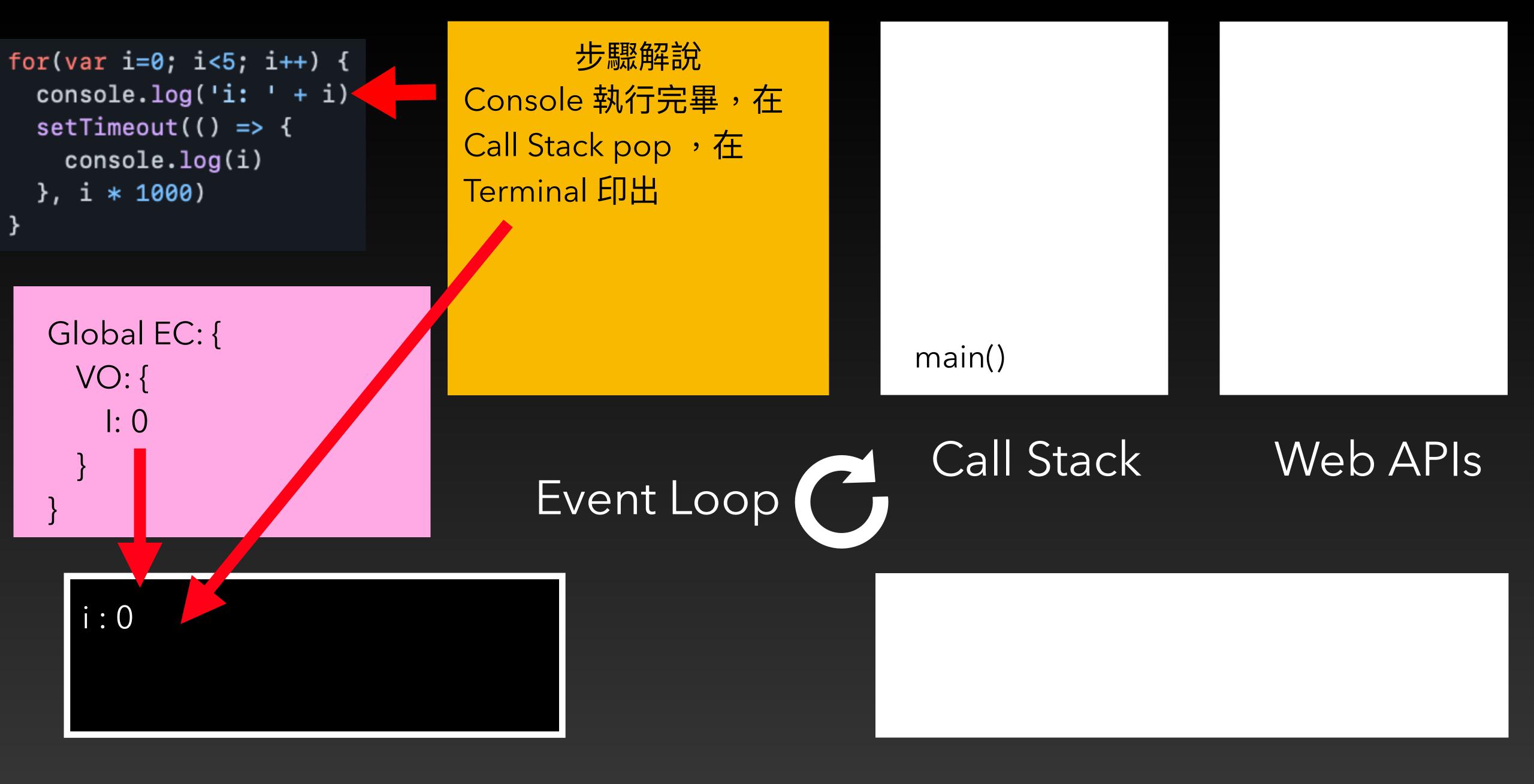
```
步驟解說
for(var i=0; i<5; i++) {
 console.log('i: ' + i)
                         執行檔案,產生 main()
 setTimeout(() => {
   console.log(i)
                         放入 Call Stack
 }, i * 1000)
                                                  main()
                                                   Call Stack
                                                                       Web APIs
                             Event Loop
           Terminal
                                                           Task Queue
```

```
步驟解說
for(var i=0; i<5; i++) {
 console.log('i: ' + i)
                           進入迴圈產生
 setTimeout(() => {
                            Global EC: {
   console.log(i)
 }, i * 1000)
                             VO: {
                               I: undefined
  Global EC: {
                                                       main()
   VO: {
      I: undefined
                                                        Call Stack
                                                                              Web APIs
                                Event Loop
```



Terminal Task Queue

```
步驟解說
for(var i=0; i<5; i++) {
                            執行 line 2 ,放入 Call
 console.log('i: ' + i)
 setTimeout(() => {
                            Stack
   console.log(i)
 }, i * 1000)
                                                       console.log('l:' + i)
  Global EC: {
                                                         main()
   VO: {
     1: 0
                                                          Call Stack
                                                                                Web APIs
                                 Event Loop
```



Terminal Task Queue

```
步驟解說
for(var i=0; i<5; i++) {
 console.log('i: ' + i)
                            執行 line 3 ,放入 Call
 setTimeout(() => {
                            Stack
   console.log(i)
 }, i * 1000)
                                                        setTimeout(cb, 0)
  Global EC: {
                                                         main()
   VO: {
     1: 0
                                                          Call Stack
                                                                                Web APIs
                                 Event Loop
    i : 0
```

Terminal

Task Queue

```
for(var i=0; i<5; i++) {
    console.log('i: ' + i)
    setTimeout(() => {
        console.log(i)
    }, i * 1000)
}

Global EC: {
    VO: {
```

1: 0

# 步驟解說

發出要求,要瀏覽器設置 0 ms 的倒數計時器,時間到了,就呼叫第一個參數的 arrow function

setTimout(cb, 0)

Event Loop

Call Stack

main()

Web APIs



Terminal

```
for(var i=0; i<5; i++) {
    console.log('i: ' + i)
    setTimeout(() => {
        console.log(i)
    }, i * 1000)
}

Global EC: {
```

VO: {

1: 0

```
步驟解說
```

倒數完成,將第一個參 數的 arrow function 放 入 Task Queue

main()

Event Loop

Web APIs

```
i:O
```

 $() = > \{console.log(i)\}$ 

Call Stack

Terminal

```
for(var i=0; i<5; i++) {
  console.log('i: ' + i)
  setTimeout(() => {
    console.log(i)
  }, i * 1000)
}
```

# 步驟解說 Event Loop 的機制是等 到 Call Stack 空了之後, 才會讓 Task Queue 的東 西放入 Call Stack。 因為 Call Stack 還有東 西,所以 Task Queue 裡 面的東西要繼續等待

main()

Event Loop

Call Stack

Web APIs

```
i:O
```

 $() = > \{console.log(i)\}$ 

Terminal

```
步驟解說
for(var i=0; i<5; i++) {
 console.log('i: ' + i)
                               | ++ 變成 1
 setTimeout(() => {
   console.log(i)
 }, i * 1000)
  Global EC: {
                                                           main()
    VO: {
      1: 1
                                                            Call Stack
                                                                                   Web APIs
                                  Event Loop
    i : 0
                                                         () = > \{console.log(i)\}
```

Task Queue

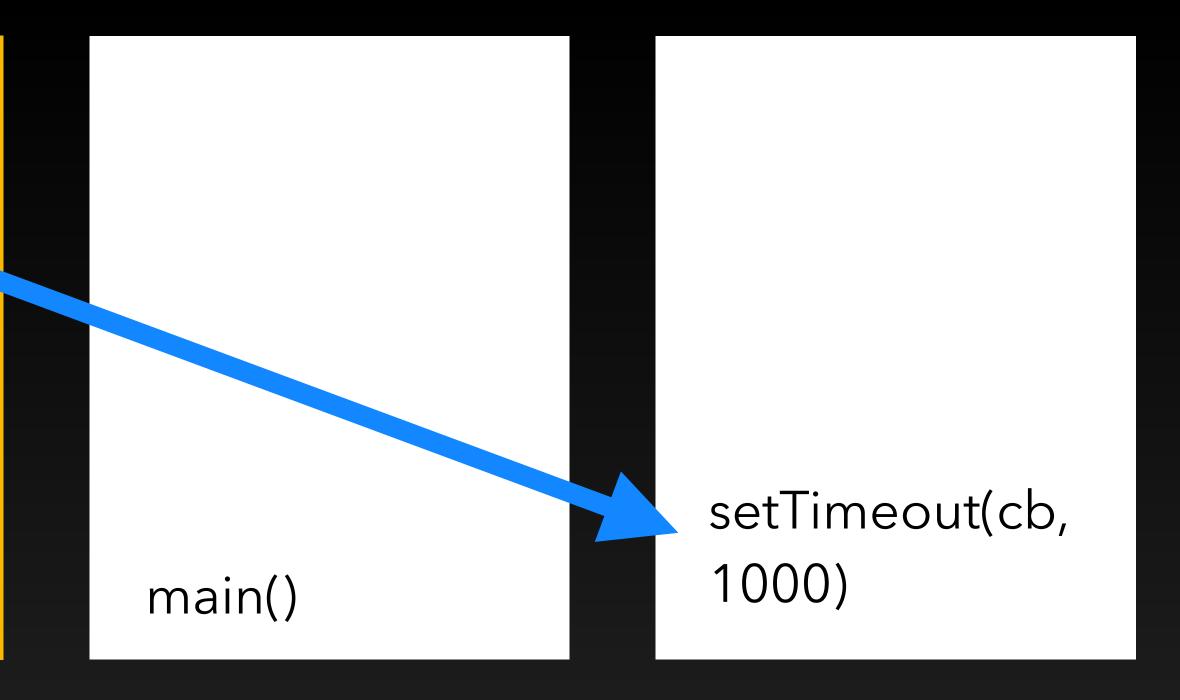
```
步驟解說
for(var i=0; i<5; i++) {
                              console.log('l:' + i)
 console.log('i: ' + i)
 setTimeout(() => {
                              放入 Call Stack
   console.log(i)
 }, i * 1000)
                                                           console.log('l:' + i)
  Global EC: {
                                                            main()
    VO: {
      1: 1
                                                             Call Stack
                                                                                    Web APIs
                                   Event Loop
    i:0
                                                           () = > \{console.log(i)\}
```

```
步驟解說
for(var i=0; i<5; i++) {
                            Console 執行完畢,在
 console.log('i: ' + i)
 setTimeout(() => {
                            Call Stack pop, 在
   console.log(i)
                            Terminal 印出
 }, i * 1000)
  Global EC: {
                                                        main()
   VO: {
     1: 1
                                                         Call Stack
                                                                               Web APIs
                                Event Loop
    i:0
                                                       () = > \{console.log(i)\}
```

```
步驟解說
for(var i=0; i<5; i++) {
 console.log('i: ' + i)
                             執行 line 3 ,放入 Call
 setTimeout(() => {
                             Stack
   console.log(i)
 }, i * 1000)
                                                          setTimeout(cb,
                                                          1000)
  Global EC: {
                                                          main()
    VO: {
      1: 1
                                                           Call Stack
                                                                                  Web APIs
                                  Event Loop
    i:0
                                                         () = > \{console.log(i)\}
```

```
for(var i=0; i<5; i++) {
  console.log('i: ' + i)
  setTimeout(() => {
    console.log(i)
  }, i * 1000)
}
```

# 步驟解說發出要求,要瀏覽器設置 1000 ms 的倒數計時器,時間到了,就呼叫第一個參數的 arrowfunction



Event Loop

Call Stack Web APIs

```
i: 0
i: 1
```

```
() = > \{console.log(i)\}
```

Terminal

```
步驟解說
for(var i=0; i<5; i++) {
 console.log('i: ' + i)
                              | ++ 變成 2
 setTimeout(() => {
   console.log(i)
 }, i * 1000)
                                                                                 setTimeout(cb,
  Global EC: {
                                                                                 1000)
                                                           main()
    VO: {
      1: 2
                                                            Call Stack
                                                                                  Web APIs
                                  Event Loop
    i:0
                                                         () = > \{console.log(i)\}
```

```
for(var i=0; i<5; i++) {
  console.log('i: ' + i)
  setTimeout(() => {
    console.log(i)
  }, i * 1000)
}
Global EC:{
```

```
步驟解說
console.log('I:' + i)
放入 Call Stack
```

```
console.log('l:' + i)
main()
```

```
setTimeout(cb, 1000)
```

```
VO: {
    I: 2
}
```

Event Loop

Call Stack

Web APIs

```
i: 0i: 1
```

```
() = > \{console.log(i)\}
```

Terminal

```
步驟解說
for(var i=0; i<5; i++) {
 console.log('i: ' + i)
                            Console 執行完畢,在
 setTimeout(() => {
                            Call Stack pop, 在
   console.log(i)
                            Terminal 印出
 }, i * 1000)
                                                                              setTimeout(cb,
  Global EC: {
                                                                              1000)
                                                         main()
   VO: {
     1: 2
                                                          Call Stack
                                                                               Web APIs
                                 Event Loop
    i:0
                                                       () = > \{console.log(i)\}
```

```
for(var i=0; i<5; i++) {
  console.log('i: ' + i)
  setTimeout(() => {
    console.log(i)
  }, i * 1000)
}
Global EC: {
```

```
步驟解說
執行 line 3,放入 Call
Stack
```

setTimeout(cb, 2000)
main()

setTimeout(cb, 1000)

VO: {
 I: 2
}

Event Loop

Call Stack

Web APIs

```
i: 0i: 1i: 2
```

 $() = > \{console.log(i)\}$ 

Terminal

```
for(var i=0; i<5; i++) {
  console.log('i: ' + i)
  setTimeout(() => {
    console.log(i)
  }, i * 1000)
}
```

# 步驟解說發出要求,要瀏覽器設置 2000 ms 的倒數計時器,時間到了,就呼叫第一個參數的 arrowfunction

main()

setTimeout(cb, 2000) setTimeout(cb, 1000)

Event Loop

Call Stack

Web APIs

```
i: 0i: 1i: 2
```

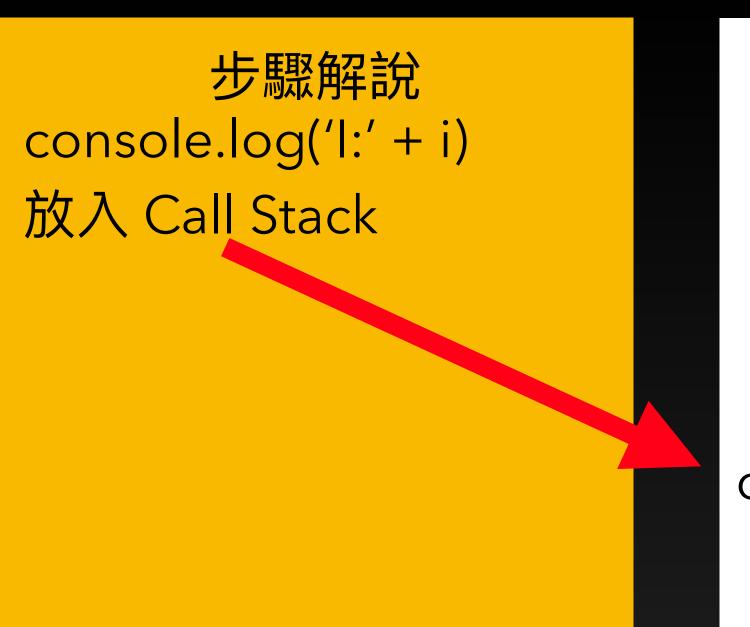
 $() = > \{console.log(i)\}$ 

Terminal

```
步驟解說
for(var i=0; i<5; i++) {
 console.log('i: ' + i)
                              | ++ 變成 3
 setTimeout(() => {
   console.log(i)
 }, i * 1000)
                                                                                setTimeout(cb,
                                                                                2000)
                                                                                setTimeout(cb,
  Global EC: {
                                                                                1000)
                                                           main()
    VO: {
      1: 3
                                                            Call Stack
                                                                                  Web APIs
                                  Event Loop
    i:0
                                                         () = > \{console.log(i)\}
```

```
for(var i=0; i<5; i++) {
  console.log('i: ' + i)
  setTimeout(() => {
    console.log(i)
  }, i * 1000)
}
```

```
Global EC: {
    VO: {
        I: 3
        }
    }
```



```
console.log('l:' + i)
main()
```

```
setTimeout(cb, 2000)
setTimeout(cb, 1000)
```

Event Loop

Call Stack

Web APIs

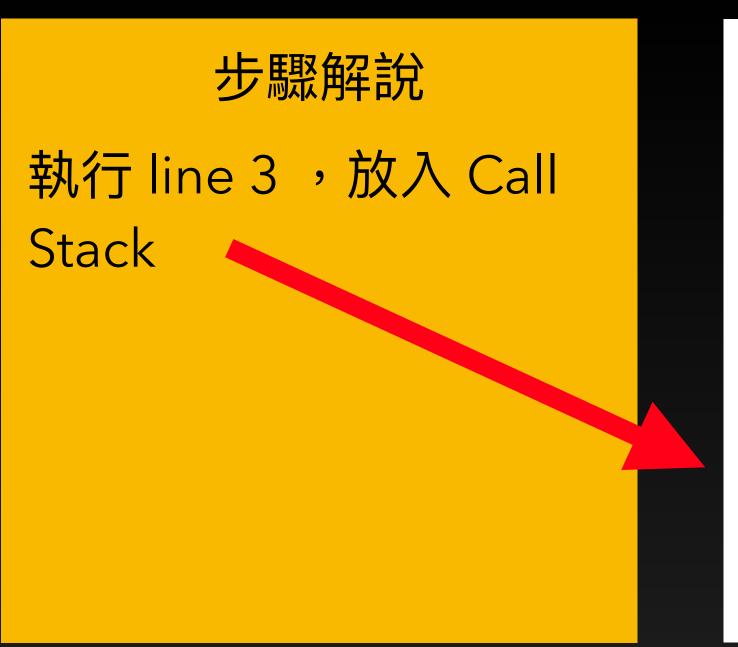
```
i: 0i: 1i: 2
```

```
() = > \{console.log(i)\}
```

Terminal

```
步驟解說
for(var i=0; i<5; i++) {
 console.log('i: ' + i)
                            Console 執行完畢,在
 setTimeout(() => {
                            Call Stack pop, 在
   console.log(i)
                            Terminal 印出
 }, i * 1000)
                                                                             setTimeout(cb,
                                                                             2000)
                                                                             setTimeout(cb,
  Global EC: {
                                                                             1000)
                                                         main()
   VO: {
     1: 3
                                                          Call Stack
                                                                                Web APIs
                                 Event Loop
                                                       () = > \{console.log(i)\}
         i:3
```

```
for(var i=0; i<5; i++) {
  console.log('i: ' + i)
  setTimeout(() => {
    console.log(i)
  }, i * 1000)
}
```



setTimeout(cb, 3000)
main()

setTimeout(cb, 2000) setTimeout(cb, 1000)

Event Loop

Call Stack

Web APIs

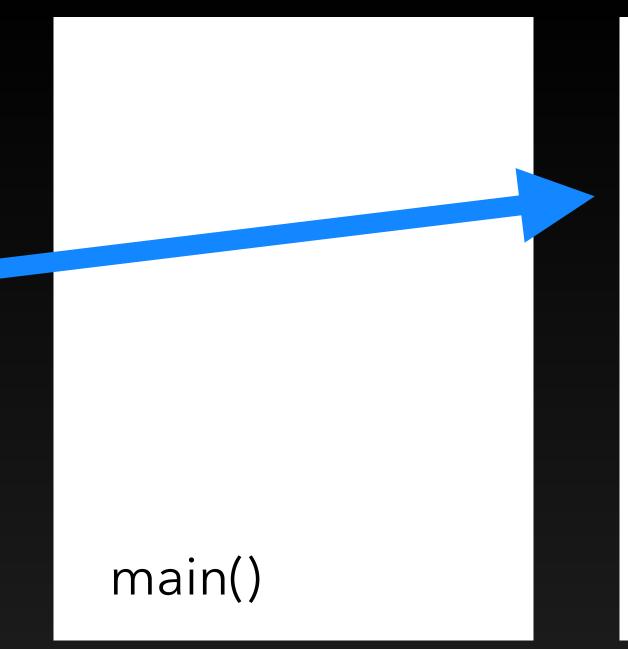
```
i: 0i: 3i: 1i: 2
```

 $() = > \{console.log(i)\}$ 

Terminal

```
for(var i=0; i<5; i++) {
  console.log('i: ' + i)
  setTimeout(() => {
    console.log(i)
  }, i * 1000)
}
```

## 步驟解說 發出要求,要瀏覽器設 置 3000 ms 的倒數計時 器,時間到了,就呼叫 第一個參數的 arrow function



setTimeout(cb, 3000)
setTimeout(cb, 2000)
setTimeout(cb, 1000)

Event Loop

Call Stack

Web APIs

```
i: 0i: 3i: 1i: 2
```

```
() = > \{console.log(i)\}
```

Terminal

```
步驟解說
for(var i=0; i<5; i++) {
 console.log('i: ' + i)
                               | ++ 變成 4
 setTimeout(() => {
   console.log(i)
 }, i * 1000)
  Global EC: {
    VO: {
      1: 4
                                  Event Loop
```

```
main()
```

```
setTimeout(cb,
3000)
setTimeout(cb,
2000)
setTimeout(cb,
1000)
```

Call Stack

Web APIs

```
i:3
```

 $() = > \{console.log(i)\}$ 

Terminal

```
for(var i=0; i<5; i++) {
  console.log('i: ' + i)
  setTimeout(() => {
    console.log(i)
  }, i * 1000)
}
```

```
步驟解說
console.log('l:' + i)
放入 Call Stack
```

set 30 set 20 console.log('l:' + i) main()

setTimeout(cb, 3000)
setTimeout(cb, 2000)
setTimeout(cb, 1000)

Event Loop C

Call Stack

Web APIs

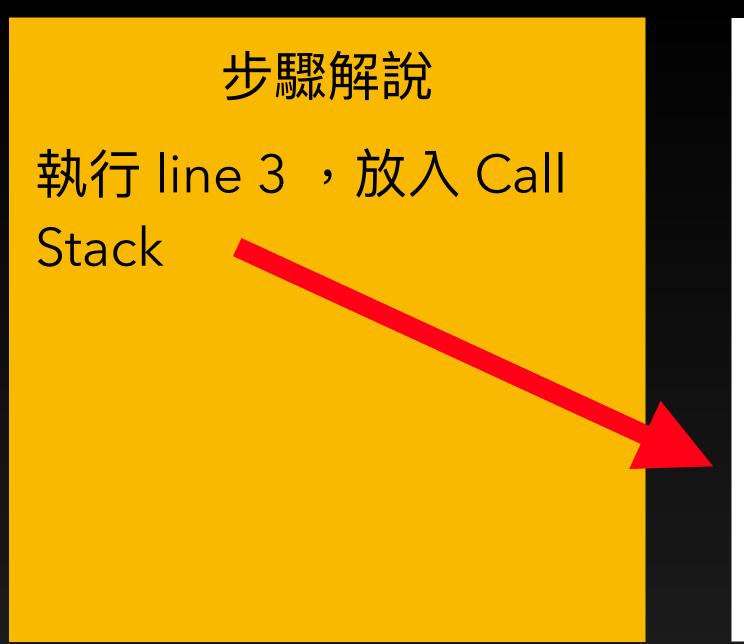
```
i: 0i: 3i: 1i: 2
```

 $() = > \{console.log(i)\}$ 

Terminal

```
步驟解說
for(var i=0; i<5; i++) {
 console.log('i: ' + i)
                            Console 執行完畢,在
                                                                              setTimeout(cb,
 setTimeout(() => {
                            Call Stack pop, 在
   console.log(i)
                                                                              3000)
                            Terminal 印出
 }, i * 1000)
                                                                              setTimeout(cb,
                                                                              2000)
                                                                              setTimeout(cb,
  Global EC: {
                                                                              1000)
                                                         main()
    VO: {
     1: 4
                                                          Call Stack
                                                                                Web APIs
                                 Event Loop
                                                        () = > \{console.log(i)\}
```

```
for(var i=0; i<5; i++) {
  console.log('i: ' + i)
  setTimeout(() => {
    console.log(i)
  }, i * 1000)
}
```



setTimeout(cb, 4000)
main()

setTimeout(cb, 3000)
setTimeout(cb, 2000)
setTimeout(cb, 1000)

Event Loop

Call Stack

Web APIs

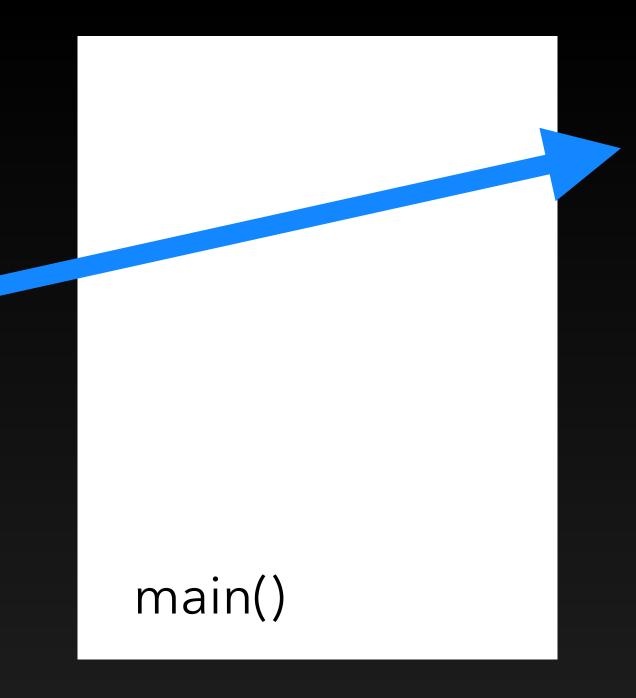
```
i: 0i: 3i: 1i: 4i: 2
```

 $() = > \{console.log(i)\}$ 

Terminal

```
for(var i=0; i<5; i++) {
  console.log('i: ' + i)
  setTimeout(() => {
    console.log(i)
  }, i * 1000)
}
```

## 步驟解說 發出要求,要瀏覽器設 置 4000 ms 的倒數計時 器,時間到了,就呼叫 第一個參數的 arrow function



setTimeout(cb, 4000) setTimeout(cb, 3000) setTimeout(cb, 2000) setTimeout(cb, 1000)

Event Loop

Call Stack

Web APIs

```
i: 0i: 3i: 1i: 4
```

```
() = > \{console.log(i)\}
```

Terminal

```
for(var i=0; i<5; i++) {
  console.log('i: ' + i)
  setTimeout(() => {
   console.log(i)
 }, i * 1000)
  Global EC: {
    VO: {
       1:5
```

```
步驟解說
| ++ 變成 5
| 跳脫迴圈
```

```
main()
```

```
setTimeout(cb,
4000)
setTimeout(cb,
3000)
setTimeout(cb,
2000)
setTimeout(cb,
1000)
```

```
Event Loop
```

Call Stack

Web APIs

```
i: 0i: 3i: 1i: 4
```

```
() = > \{console.log(i)\}
```

Terminal

```
for(var i=0; i<5; i++) {
  console.log('i: ' + i)
  setTimeout(() => {
    console.log(i)
  }, i * 1000)
}
```

```
main()執行完畢,pop
```

```
setTimeout(cb,
4000)
setTimeout(cb,
3000)
setTimeout(cb,
2000)
setTimeout(cb,
1000)
```

Event Loop

Call Stack

Web APIs

```
i: 0i: 3i: 1i: 4
```

```
() = > \{console.log(i)\}
```

Terminal

```
for(var i=0; i<5; i++) {
  console.log('i: ' + i)
  setTimeout(() => {
    console.log(i)
  }, i * 1000)
}
```

Call Stack 空了,因為
Event Loop 是先進先
出,所以放行第一個進
來 Task Queue 的東西去
Call Stack

```
() => {
console.log(i)
}
```

setTimeout(cb,
4000)
setTimeout(cb,
3000)
setTimeout(cb,
2000)
setTimeout(cb,
1000)

Event Loop

Call Stack

Web APIs

```
i: 0i: 3i: 1i: 4i: 2
```

Terminal

```
setTimeout(cb,
                                  步驟解說
for(var i=0; i<5; i++) {
                                                                           4000)
 console.log('i: ' + i)
                           執行 arrow function
                                                                           setTimeout(cb,
 setTimeout(() => {
                           去找到i,並印出來,從
   console.log(i)
                                                                           3000)
 }, i * 1000)
                           Call Stack pop
                                                                           setTimeout(cb,
                                                                           2000)
                                                                           setTimeout(cb,
  Global EC: {
                                                                           1000)
   VO: {
                                                        Call Stack
                                                                             Web APIs
                                Event Loop
```

```
for(var i=0; i<5; i++) {
  console.log('i: ' + i)
  setTimeout(() => {
    console.log(i)
  }, i * 1000)
}
```

```
Global EC: {
    VO: {
        I:5
     }
}
```

以上都是幾乎一瞬間完 成

```
setTimeout(cb,
4000)
setTimeout(cb,
3000)
setTimeout(cb,
2000)
setTimeout(cb,
1000)
```

Event Loop

Call Stack

Web APIs

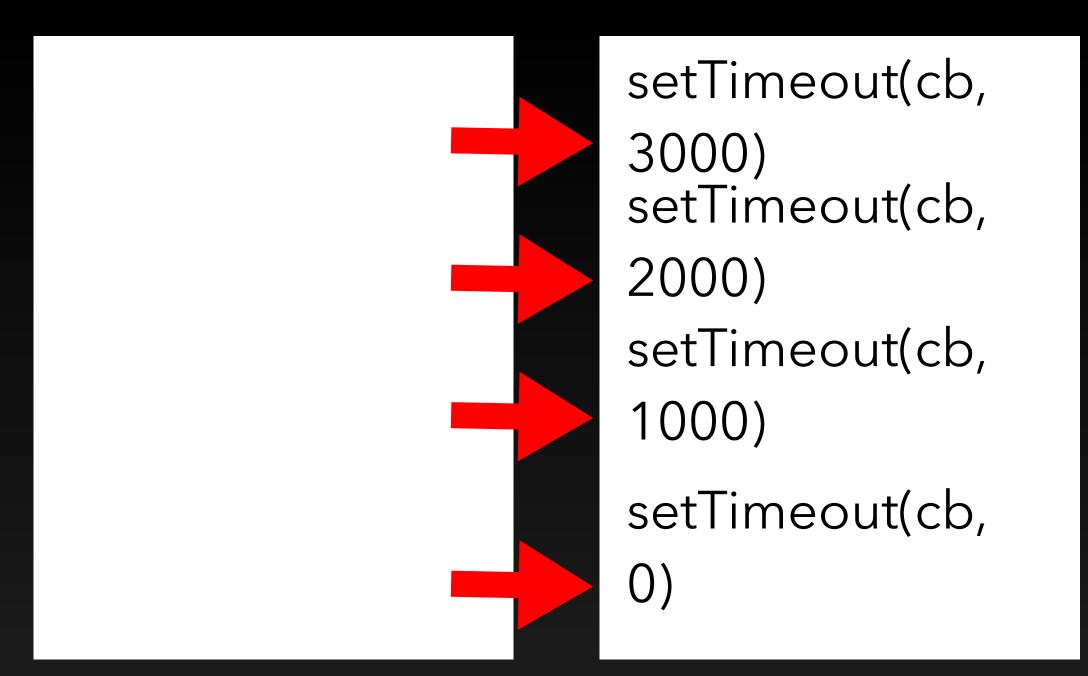
```
i: 0i: 3i: 1i: 4i: 25
```

Terminal

```
for(var i=0; i<5; i++) {
  console.log('i: ' + i)
  setTimeout(() => {
    console.log(i)
  }, i * 1000)
}
```

```
Global EC: {
    VO: {
        I:5
     }
}
```

一秒鐘過後,大家計時 器一起少一秒



Event Loop

Call Stack

Web APIs

```
i: 0i: 3i: 1i: 4i: 25
```

Terminal

```
for(var i=0; i<5; i++) {
  console.log('i: ' + i)
  setTimeout(() => {
    console.log(i)
  }, i * 1000)
}
```

有一個計時器倒數完成,將第一個參數的 arrow function 放入 Task Queue

setTimeout(cb, 3000)
setTimeout(cb, 2000)
setTimeout(cb, 1000)

Event Loop

Call Stack

Veb APIs

```
i: 0i: 3i: 1i: 4i: 25
```

 $() = > \{console.log(i)\}$ 

Terminal

```
for(var i=0; i<5; i++) {
  console.log('i: ' + i)
  setTimeout(() => {
    console.log(i)
  }, i * 1000)
}
```

Call Stack 空了,因為 Event Loop 是先進先 出,所以放行 Task Queue 的東西去 Call Stack

```
() => {
console.log(i)
}
```

```
setTimeout(cb, 3000)
setTimeout(cb, 2000)
setTimeout(cb, 1000)
```

Event Loop

Call Stack

Web APIs

```
i: 0i: 3i: 1i: 4i: 25
```

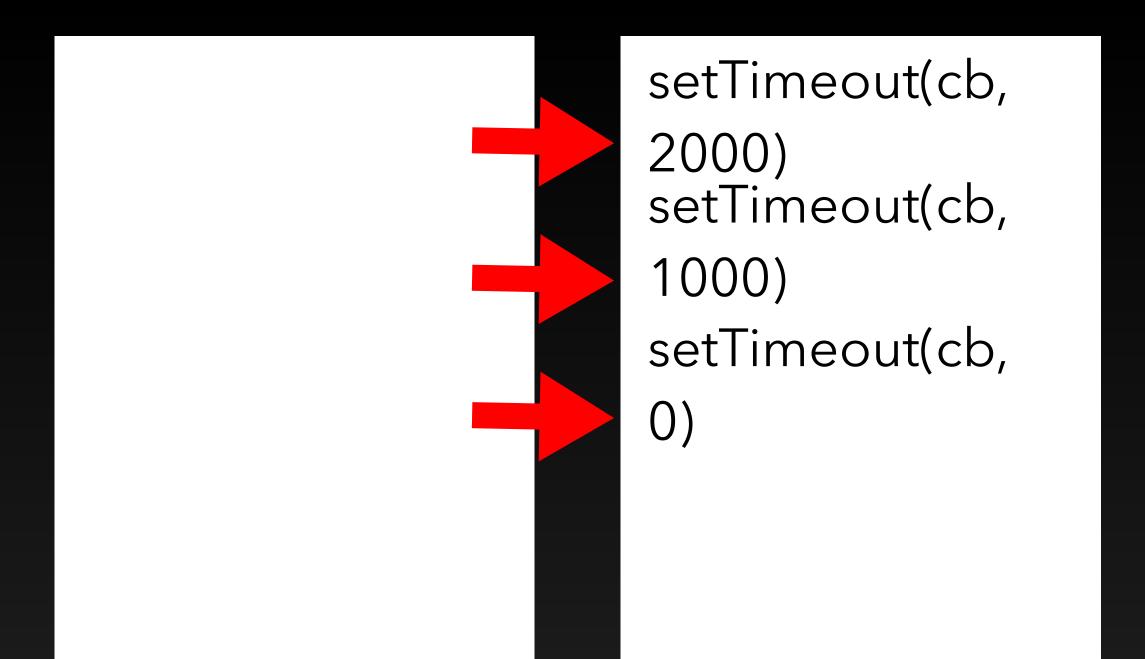
Terminal

```
setTimeout(cb,
                                  步驟解說
for(var i=0; i<5; i++) {
                                                                          3000)
 console.log('i: ' + i)
                           執行 arrow function
                                                                          setTimeout(cb,
 setTimeout(() => {
                           去找到i,並印出來,從
   console.log(i)
                                                                          2000)
 }, i * 1000)
                           Call Stack pop
                                                                          setTimeout(cb,
                                                                          1000)
  Global EC: {
   VO: {
                                                        Call Stack
                                                                            Web APIs
                                Event Loop
```

```
for(var i=0; i<5; i++) {
  console.log('i: ' + i)
  setTimeout(() => {
    console.log(i)
  }, i * 1000)
}
```

```
Global EC: {
    VO: {
        I:5
     }
}
```

一秒鐘過後,大家計時 器一起少一秒



Event Loop

Call Stack

Web APIs

```
i: 0i: 3i: 1i: 4i: 25
```

Terminal

```
for(var i=0; i<5; i++) {
  console.log('i: ' + i)
  setTimeout(() => {
    console.log(i)
  }, i * 1000)
}
```

```
Global EC: {
    VO: {
        I:5
     }
}
```

有一個計時器倒數完成,將第一個參數的 arrow function 放入 Task Queue

```
setTimeout(cb,
2000)
setTimeout(cb,
1000)
```

Event Loop

Call Stack

Web APIs

```
i: 0i: 3i: 1i: 4i: 25
```

```
() = > \{console.log(i)\}
```

Terminal

```
for(var i=0; i<5; i++) {
  console.log('i: ' + i)
  setTimeout(() => {
    console.log(i)
  }, i * 1000)
}
```

Call Stack 空了,因為 Event Loop 是先進先 出,所以放行 Task Queue 的東西去 Call Stack

Event Loop

```
() => {
console.log(i)
}
```

setTimeout(cb, 2000) setTimeout(cb, 1000)

Call Stack

Web APIs

```
i: 0i: 3i: 1i: 4i: 25
```

Terminal

```
setTimeout(cb,
                                  步驟解說
for(var i=0; i<5; i++) {
                                                                          2000)
 console.log('i: ' + i)
                           執行 arrow function
                                                                          setTimeout(cb,
 setTimeout(() => {
                           去找到i,並印出來,從
   console.log(i)
                                                                          1000)
 }, i * 1000)
                           Call Stack pop
  Global EC: {
   VO: {
                                                       Call Stack
                                                                            Web APIs
                               Event Loop
```

```
for(var i=0; i<5; i++) {
    console.log('i: ' + i)
    setTimeout(() => {
        console.log(i)
    }, i * 1000)
}

Global EC: {
    VO: {
        I:5
```

Event Loop

```
setTimeout(cb,
                 1000)
                 setTimeout(cb,
                 0)
                   Web APIs
Call Stack
```

```
i: 0
i: 3
i: 1
i: 4
5
i: 2
5
```

Terminal

```
for(var i=0; i<5; i++) {
  console.log('i: ' + i)
  setTimeout(() => {
    console.log(i)
  }, i * 1000)
}
```

有一個計時器倒數完成,將第一個參數的 arrow function 放入 Task Queue

Event Loop

Call Stack

Web APIs

setTimeout(cb,

1000)

```
i: 0
i: 3
i: 1
i: 4
5
i: 2
5
```

Terminal

 $() => \{console.log(i)\}$ 

```
for(var i=0; i<5; i++) {
  console.log('i: ' + i)
  setTimeout(() => {
    console.log(i)
  }, i * 1000)
}
```

Call Stack 空了,因為 Event Loop 是先進先 出,所以放行 Task Queue 的東西去 Call Stack

Event Loop

```
() => {
console.log(i)
}
```

setTimeout(cb, 1000)

Call Stack Web APIs

```
i: 0
i: 3
i: 1
i: 4
5
i: 2
5
```

Terminal

```
setTimeout(cb,
                                 步驟解說
for(var i=0; i<5; i++) {
                                                                         1000)
 console.log('i: ' + i)
                           執行 arrow function
 setTimeout(() => {
                           去找到i,並印出來,從
   console.log(i)
 }, i * 1000)
                          Call Stack pop
  Global EC: {
   VO: {
                                                                           Web APIs
                                                       Call Stack
                               Event Loop
```

Terminal

Task Queue

```
setTimeout(cb,
                                步驟解說
for(var i=0; i<5; i++) {
                                                                      0)
 console.log('i: ' + i)
                          一秒鐘過後,大家計時
 setTimeout(() => {
   console.log(i)
                         器一起少一秒
 }, i * 1000)
  Global EC: {
   VO: {
     1:5
                                                     Call Stack
                                                                         Web APIs
                              Event Loop
```

```
for(var i=0; i<5; i++) {
  console.log('i: ' + i)
  setTimeout(() => {
    console.log(i)
  }, i * 1000)
}
```

```
Global EC: {
    VO: {
        I:5
     }
}
```

有一個計時器倒數完成,將第一個參數的 arrow function 放入 Task Queue

Event Loop

Call Stack

Web APIs

```
i: 0
i: 3
i: 1
i: 4
5
i: 2
5
```

```
Terminal
```

 $() = > \{console.log(i)\}$ 

```
for(var i=0; i<5; i++) {
  console.log('i: ' + i)
  setTimeout(() => {
    console.log(i)
  }, i * 1000)
}
```

```
Global EC: {
    VO: {
        I:5
      }
}
```

i:4

# 步驟解說

Call Stack 空了,因為 Event Loop 是先進先 出,所以放行 Task Queue 的東西去 Call Stack

```
() => {
console.log(i)
}
```

Call Stack

Web APIs

Event Loop

Terminal

