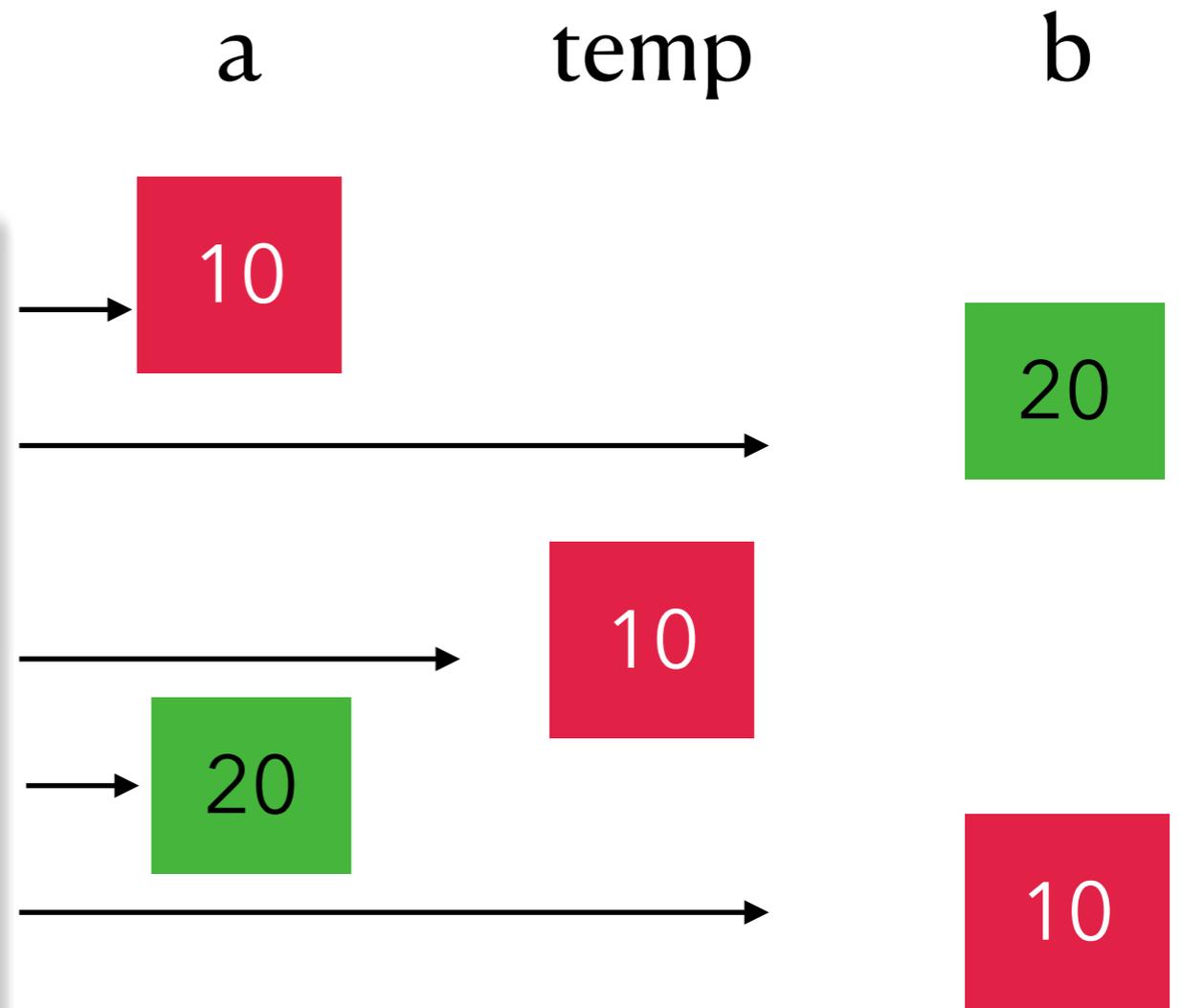


Conditional if and for- looping

Swap, any condition, string find, random choice

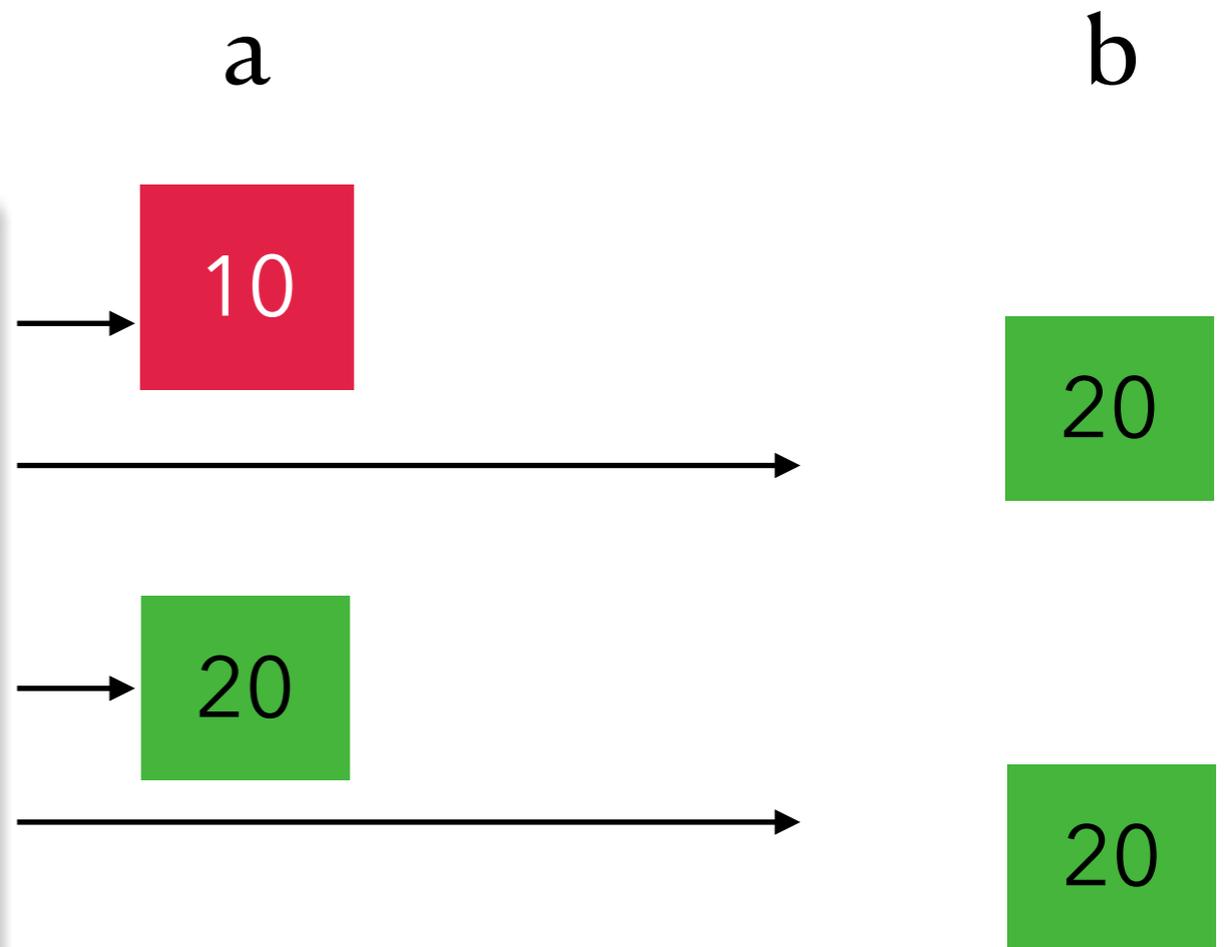
SWAP

```
a = 10  
b = 20  
print("a: ",a,"b: ",b)  
temp = a  
a = b  
b = temp  
print("a: ",a,"b: ",b)  
a: 10 b: 20  
a: 20 b: 10
```



SWAP 交換

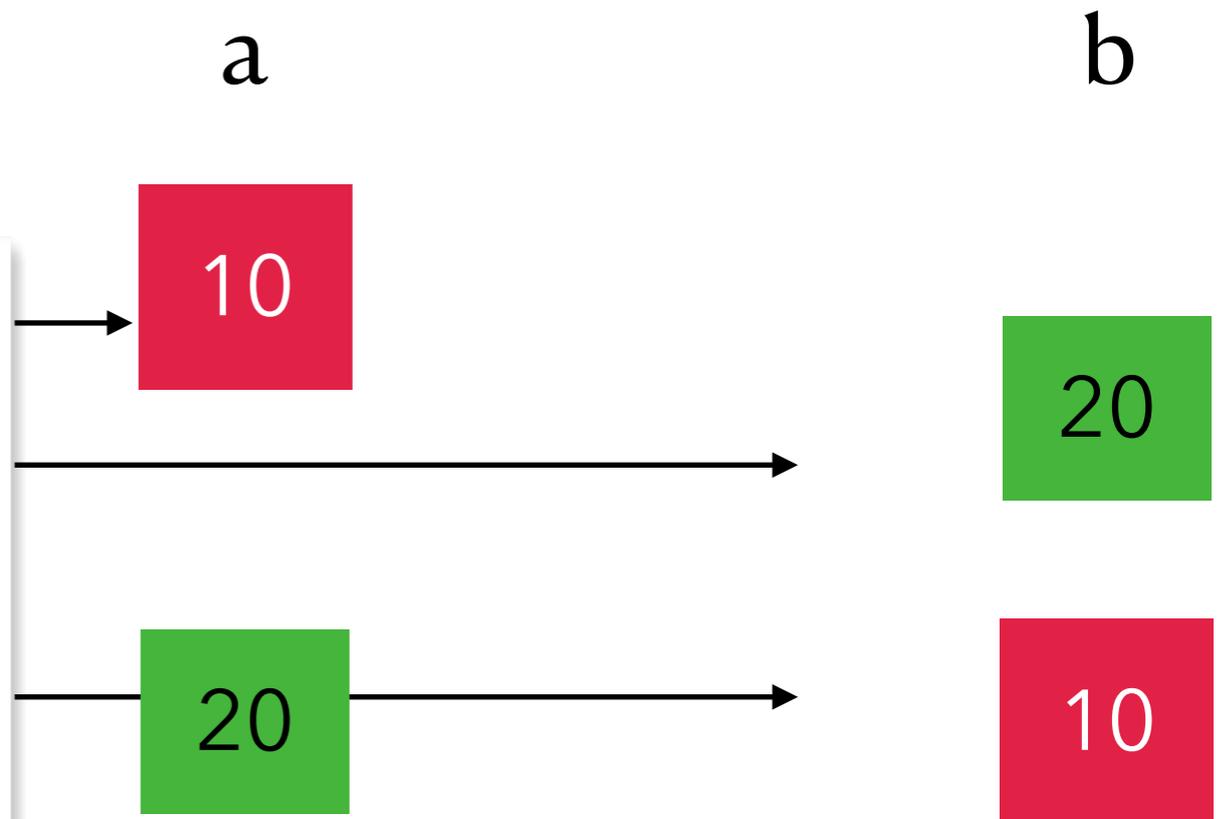
```
a = 10  
b = 20  
print("a: ",a,"b: ",b)  
a = b  
b = a  
print("a: ",a,"b: ",b)  
a: 10 b: 20  
a: 20 b: 20
```



變數交換的語義錯誤

同時將
a,b的
內容只
訂到
b,a

```
a = 10  
b = 20  
print("a: ", a, "b: ", b)  
b, a = a, b  
print("a: ", a, "b: ", b)  
a: 10 b: 20  
a: 20 b: 10
```



以空格為分割符號，將輸入字串分割成串列

```
a = input("input charactiers").split()
print(a)
print(set(a))
```

將串列轉換為集合

```
input charactiers>? A B C DD FF B A C C C
['A', 'B', 'C', 'DD', 'FF', 'B', 'A', 'C', 'C', 'C']
{'FF', 'C', 'DD', 'B', 'A'}
```

集合中不同元素只出現一次

分割後的元素

```
rna = "GATTAGATTATTTTTTTTAAAATATATA"  
pattern = "TAA"  
ind = rna.find(pattern)  
print(rna)  
print(" "*ind+"^"+pattern)
```

在rna字串中搜尋
pattern，如果有找到，
ind紀錄出現位置

```
GATTAGATTATTTTTTTTAAAATATATA  
          ^TAA
```

If else

- 印出奇數或偶數

```
>>> n = 23
>>> if n % 2 == 1:
...     print(n, ' is an odd number')
... else:
...     print(n, ' is an even number')
...
23 is an odd number
```

If elif else

```
while True:
    s = input('key in an integer')
    try :
        n = int(s)
        print('input is ', n)
    except:
        continue
    if n > 0:
        print(n, ' is positive')
    elif n < 0:
        print(n, ' is negative')
    else:
        print(n, ' is zero')
    break
```

輸入正整數、負整數
或零

```
key in an integer>? 89.9
key in an integer>? 89
input is 89
89 is positive
```

```
n = 11
if n == 1:
    print("鼠")
elif n == 4:
    print("兔")
elif n == 6:
    print("蛇")
elif n == 11:
    print("狗")
else:
    print("其他")
```

狗

條件
cond
為布
林值

```
card = int(input("input a number between 1..13"))
```

```
cond = card > 1 and card <= 10
```

```
if cond:
```

```
    num = card
```

如果條件cond為真，
執行if cond:中的命令

```
else:
```

```
    num = 10
```

否則執行else:中的命令

```
print(num)
```

```
input a number between 1..13>? 5
```

```
5
```

```
card = int(input("input a number between 1..13"))
cond = [card == 1,
        card == 11,
        card == 12,
        card == 13
       ]
if any(cond):
    num = 10
else:
    num = card
print(num)
```

串列cond中包含多個元素，每個元素描述一個條件

串列cond中的多個條件，只要有一個條件成立，就執行 if cond: 中的指令

```
input a number between 1...13>? 12
10
```

```
import random
lst = [i for i in range(1,14)]
print(lst)
scoreSum = 0.0
times = 100000
for i in range(times):
    score = random.choice(lst)
    scoreSum += score
print(scoreSum/times)
```

6.99071

```
1 import random
2 def card2score(card):
3     cond = [card == 1,
4             card == 11,
5             card == 12,
6             card == 13]
7
8     if any(cond):
9         num = 10
10    else:
11        num = card
12    return num
13
14 lst = [i for i in range(1,13)]
15 scoreSum = 0
16 times = 100000
17 for i in range(times):
18     card1 = random.choice(lst)
19     card2 = random.choice(lst)
20     score = card2score(card1) + card2score(card2)
21     scoreSum += score
22 print('average score: ', scoreSum/times)
```

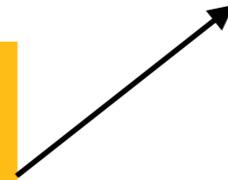
1 到 13 隨機產生 2 張牌
黑傑克的平均點數？

(1,14)





CNN
Image
Classifier



牛

虎

蛇



CNN
Image
Classifier

猴

雞

豬

```
n = 5
for i in range(n):
    print(i)
```

迭代執行命令，
依序將0到n-1
代入i，執行回
圈命令

第一次回
圈，i值為0

```
0
1
2
3
4
```

最後一次回圈i值為
n-1

```
import random
lst = []
for i in range(1,7):
    lst.append(i)
print(lst)
print(random.choice(lst))
```

迭代執行命令，
依序將1到7-1代
入i，執行回圈命
令，將i值附加在
串列lst

```
[1, 2, 3, 4, 5, 6]
3
```

最後一次回圈i值為
7-1

```
import random
lst = [i for i in range(1,7)]
print(lst)
print(random.choice(lst))
```

迭代執行命令，
依序將1到7-1代
入i，執行回圈命
令，將i值附加在
串列lst

```
[1, 2, 3, 4, 5, 6]
2
```

從串列lst中，隨機選
擇一個元素

```
import random
Card = [i for i in range(1,14)]
card = random.choice(Card)
num = card if card < 10 and card > 1 else 10
print(card,"->", num)
```

形成包含1到13
的串列

從串列
Card
中，隨
機選擇
一個數

```
1 -> 10
```

滿足條件
card < 10 and card > 1，
將num設定為card，否則設定為10

```

import random
Dice = [i for i in range(1,7)]
p = []
times = 20000
for i in range(times):
    dice = random.choice(Dice)
    p.append(dice)
print("p:",p)
a = set(p)
for j in a:
    print(j, " appears ", p.count(j), ", times ", p.count(j)/times )

```

串列Dice包含1到6

迴圈執行20次

將dice附加在串列p

從串列Dice中，隨機選擇一個元素

```

p: [2, 3, 2, 4, 4, 3, 1, 4, 6, 2, 4, 4, 3, 6, 5, 3, 4, 2, 3, 3]
1  appears  1  times
2  appears  4  times
3  appears  6  times
4  appears  6  times
5  appears  1  times
6  appears  2  times

```

a為集合，j代表集合中的每一個元素，p.count(j)代表j在串列p中出現的次數

```
try:
    n = int(input("input a number between 1 and 10 : "))
except:
    print("invalid number")
    exit()

for i in range(n):
    print("*"*i)
```

將輸入字串
轉換為整數

如果轉換失
離開

```
input a number between 1 and 10 : >? 7
*
**
***
****
*****
*****
*****
*****
```