Sankify Python 3 課程 Lesson 3 說明

Script	done
Video	done

Lesson 3 : Conditions: if, then, else

> https://snakify.org/en/lessons/if_then_else_conditions/

Syntax

```
a = 5
if a==5:
    print("a==5")
else:
    print("a!=5")

if a>10:
    print("a>10")
else:
    print("a<=10")
```

```
if condition:
    true-block
    several instructions that are executed
    if the condition evaluates to True
else:
    false-block
    several instructions that are executed
    if the condition evaluates to False
```

```
a==5
a<=10
```

Are they 100% identical?

```
x = int(input())

if x>0:
    print(x)
```

```
-6
6
```

```
x = int(input())

if x<0:
```

```
else:
    print(-x)
```

```
    x=-x
print(x)
```

Nested conditions

```
x = int(input())
y = int(input())
if x > 0:
    if y > 0:
        print("Quadrant 1")
    else:
        print("Quadrant 4")
else:
    if y > 0:
        print("Quadrant 2")
    else:
        print("Quadrant 3")
```

```
x = int(input())
y = int(input())
if x > 0 and y>0:
    print("Quadrant 1")
if x >0 and y<0:
    print("Quadrant 4")
# add your code here
```

Comparison operators : >, <, ==, >=, <=, !=

```
print(f"1>2  : {1>2}")
print(f"1<2  : {1<2}")
print(f"1==2 : {1==2}")
print(f"1!=2 : {1!=2}")
print(f"9==9 : {9==9}")
print(f"9!=9 : {9!=9}")
print(f"9>9  : {9>9}")
print(f"9>=9 : {9>=9}")
```

```
1>2  : False
1<2  : True
1==2 : False
1!=2 : True
9==9 : True
9!=9 : False
9>9  : False
9>=9 : True
```

```
print(f"'abc'=='abc' : {'abc'=='abc'}")
print(f"'abc'>'ab'   : {'abc'>'ab'}")
print(f"'abc'<'ab'   : {'abc'<'ab'}")
print(f"'abc'!='ab'  : {'abc'!='ab'}")
print(f"'abc'=='c'   : {'abc'=='c'}")
print(f"'abc'!='c'   : {'abc'!='c'}")
print(f"'abc'>'c'    : {'abc'>'c'}")
print(f"'abc'<'c'    : {'abc'<'c'}")
```

```
'abc'=='abc' : True
'abc'>'ab'   : True
'abc'<'ab'   : False
'abc'!='ab'  : True
'abc'=='c'   : False
'abc'!='c'   : True
'abc'>'c'    : False
'abc'<'c'    : True
```

Bool objects and logical operators : True, False, and, or

```
print(f"1>2 and 2>3 : {1>2 and 2>3}")
print(f"1<2 and 2<3 : {1<2 and 2<3}")
print(f"1<2 or 2>3  : {1<2 or 2>3}")
print(f"1>2 or 2<3  : {1>2 or 2<3}")
```

```
print(f"1>2>3       : {1>2>3}")
print(f"1<2<3       : {1<2<3}")
```

```
1>2 and 2>3 : False
1<2 and 2<3 : True
1<2 or 2>3  : True
1>2 or 2<3  : True
1>2>3       : False
1<2<3       : True
```

```
print(f"not True        : {not True}")
print(f"not False       : {not False}")
print(f"True and True   : {True and True}")
print(f"True and False  : {True and False}")
print(f"False and True  : {False and True}")
print(f"False and False : {False and False}")
print(f"True or True    : {True or True}")
print(f"True or False   : {True or False}")
print(f"False or True   : {False or True}")
print(f"False or False  : {False or False}")
```

```
not True        : False
not False       : True
True and True   : True
True and False  : False
False and True  : False
False and False : False
True or True    : True
True or False   : True
False or True   : True
False or False  : False
```

Using 3 different coding styles to complete the letter grading program

```
# g>=90 A
# g>=80 B
# g>=70 C
# g>=60 D
# others F

g = int(input())

if g>=90:
    print("A")
else:
    if g>=80:
        print("B")
# add your code here
```

```
g = int(input())

if g>=90:
    print("A")
if g<90 and g>=80:
    print("B")
# add your code here
```

```
g = int(input())

if g>=90:
    print("A")
elif g>=80:
    print("B")
# add your code here
```

Snakify 範例解析：Chess board - same color

✏️ Given two cells of a chessboard. If they are `painted in one color`, print the word YES, and if in a different color - NO.

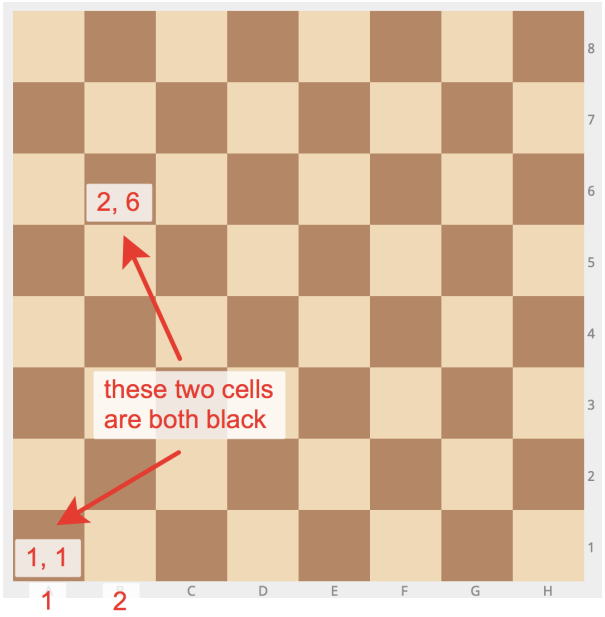
Model solution

```
x1 = int(input())
y1 = int(input())
```

```
x2 = int(input())
y2 = int(input())

if (x1%2==y1%2) and (x2%2==y2%2):
    print("YES")
elif (x1%2+y1%2)==1 and (x2%2+y2%2)==1:
    print("YES")
else:
    print("NO")
```

『程式』常常會有一種以上的寫法。



Source :
https://snakify.org/en/lessons/if_then_else_conditions/problems

```
x1 = int(input())
y1 = int(input())
x2 = int(input())
y2 = int(input())

if (x1 + y1 + x2 + y2) % 2 == 0:
    print('YES')
else:
    print('NO')
```

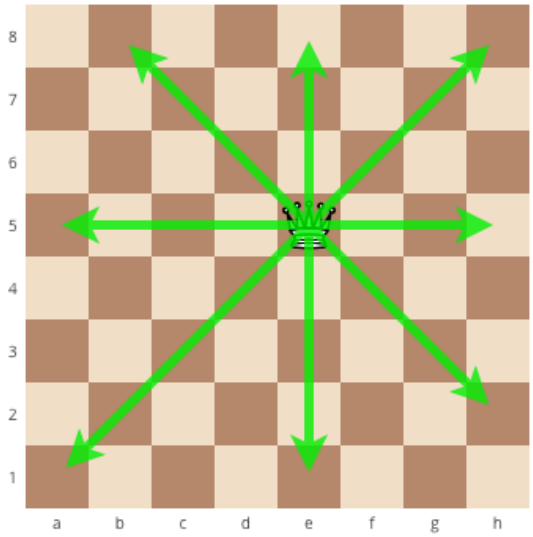
```
x1 = int(input())
y1 = int(input())
x2 = int(input())
y2 = int(input())

def color(x,y):
    if x%2==y%2:
        return 1
    return 0

if color(x1,y1)==color(x2,y2):
    print("YES")
else:
    print("NO")
```

Snakify 範例解析：Queen move

Chess queen moves `horizontally`, `vertically` or `diagonally` to any number of cells. Given two different cells of the chessboard, determine whether a queen can go from the first cell to the second in one move.



Source : https://snakify.org/en/lessons/if_then_else_conditions/problems/queen_move/

```
x1 = int(input())
y1 = int(input())
x2 = int(input())
y2 = int(input())

if x1==x2 or y1==y2 or abs(x1-x2)==abs(y1-y2):
    print("YES")
else:
    print("NO")
```

Snakify 範例解析：Chocolate bar

> Source : https://snakify.org/en/lessons/if_then_else_conditions/problems/chocolate/

Chocolate bar has the form of a rectangle divided into `n × m` portions. Chocolate bar can `be split into two rectangular parts` by breaking it along a selected straight line on its pattern. Determine whether it is possible to split it so that one of the parts will `have exactly k squares`.

```
n = int(input())
m = int(input())
k = int(input())

if n*m>k and (k%n==0 or k%m==0):
    print("YES")
else:
    print("NO")
```