

Decision Structures

- Boolean types: True, False
 $\begin{matrix} \text{True} & \text{False} \\ (\text{จริง}) & (\text{เท็จ}) \\ 1 & 0 \end{matrix}$

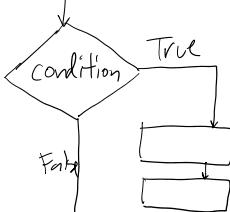
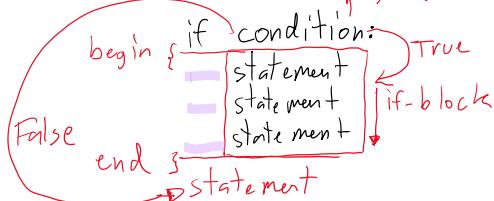
- Comparison Operators \rightarrow True, False

$>$, $<$, \geq , \leq , $=$, \neq
 (มากกว่า) (น้อยกว่า) (เท่ากับ) (ไม่เท่ากับ)

Ex: $3 > 5 \rightarrow 3 \text{ มากกว่า } 5 \text{ หรือ?} \rightarrow \text{False}$
 $5 = 7 \rightarrow 5 \text{ เท่ากับ } 7 \text{ หรือ?} \rightarrow \text{False}$
 $x = (3 \neq 7) \rightarrow \text{True}$
 $\text{print}(x) \rightarrow \boxed{\text{True}}$

if statement: ถ้าเงื่อนไขเป็นจริง

True, False



Ex1: $\text{if } z \geq 3:$
 $\quad \quad \quad \text{print("Hi")}$ \rightarrow If-block
 $\quad \quad \quad \text{print("Good")}$ \rightarrow If-block
 $\quad \quad \quad \text{print("Done")}$ \rightarrow If-block

Ex2: $\text{Cond1} = (7 \neq 5) \rightarrow \text{True}$
 $\text{if Cond1: True} \rightarrow \text{If True!}$
 $\quad \quad \quad \text{print("Hi")}$ \rightarrow Hi
 $\quad \quad \quad \text{print("Done")}$ \rightarrow Done

Ex3: if True:
 $\quad \quad \quad \text{print("Hi")}$ \rightarrow Hi

Ex: $\text{var Donut, Cupcake}$

$5 \text{ var } 20 \text{ var}$

- input: รับค่า donut & cupcake
- output: 打出结果 ห้ามล้อ
- ④ Named Constant

DONUT_P = 5

CUPCAKE_P = 20

DISCOUNT = 0.9

- . Named constant ✓
- . Input ✓
- . process
 \hookrightarrow คำนวณผลลัพธ์
- . Output

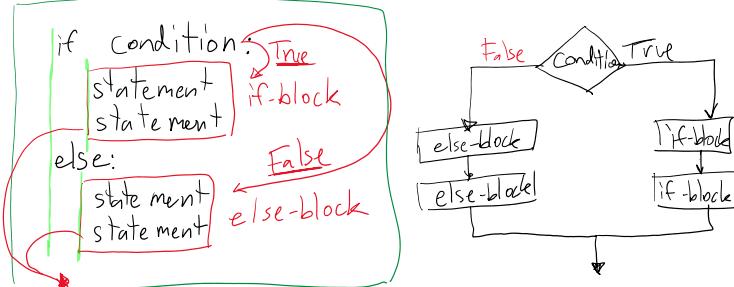
n_donut = int(input("Enter D."))
n_cupcake = int(input("Enter C."))
total = n_donut * DONUT_P + n_cupcake * CUPCAKE_P
discounted_total = total * DISCOUNT
if total > 100:
 total += 1 + 1 + 1 * DISCOUNT (ลดเพิ่ม)


```

→ discounted_total = total    (የተስተካከለ ነው)
if total > 100:
    → discounted_total = total * DISCOUNT (የስተኞች)
print(f'{total:.2f}')
print(f'{discounted_total:.2f}')

```

if-else statement: የሚከተሉትን በታች ማስረጃዎች እንደሆነ ይችላል



Ex1 if $x > 5$:
 print('A') → A
 else:
 print('B')
 print('Done') → Done

Ex2: if $x \neq 7$:
 print('C')
 else:
 print('D') → D
 print('Done') → Done

Ex3 total = 130
 if total > 100:
 → discounted_total = total * 0.9 (የሰጠውን)
 130 * 0.9 = 117
 else:
 → discounted_total = total (የሰጠውን)
 print(discounted_total) → 117

Nested decision structures

Ex1 if $x > 5$:
 print("A")
 if $z \neq 2$:
 print(10) → 10
 else:
 print(7)
 print('Done') → Done

Loan Qualification

- የመስክር የስራ ደንብ ጥሩ በታች ማስረጃዎች
- 1) የሚከፈል ደንብ ዘመን የስራ ደንብ ንዑስ ነው 20,000
- ~) የዚህ ደንብ ዘመን ንዑስ ነው 20

- 1) ສົ່ວໂລກ ມາກອາງເຂົ້າເກີນ ກີບ 20,000
 - 2) ອັນ ຢຳເນັດ ຫຼື ເຫັນວ່າ 2
- ↳ ສົ່ວໂລກ ມີຄວາມ ຂອງ ດີເລີຍ ໃຫຍ້

```

salary = float(input("Enter salary :"))
year = int(input("Enter year :"))

if salary >= 20000:
    if year >= 2:
        print("Qualified!!")
    else:
        print('Not qualified')
else:
    print("Not qualified")

```

Logical Operators

↳ operator ສົ່ວໂລກ ມີ boolean (truth value)

- 1) and (\wedge , $\&$)
(ເບີວິວ)

| X | Y | X and Y |
|-------|-------|---------|
| True | True | True |
| True | False | False |
| False | True | False |
| False | False | False |

- 2) or (\vee , $\|$)
(ເວີວິວ)

| X | Y | X or Y |
|-------|-------|--------|
| True | True | True |
| True | False | True |
| False | True | True |
| False | False | False |

- 3) not (\neg , $!$)

| X | not X |
|-------|-------|
| True | False |
| False | True |

Ex1: $\text{Salary} = \text{input} \dots$
 $\text{year} = \text{input} \dots$
 $\text{if } (\text{Salary} \geq 20000) \text{ and } (\text{Year} \geq 2):$
 $\quad \text{print("Q")}$
 else:
 $\quad \text{print("Not Q")}$

$30000 \geq 20000 \rightarrow \text{True}$ $1 \geq 2 \rightarrow \text{False}$
 $\text{True and False} \rightarrow \text{False}$

Ex2:
 $\text{Cond1} = (\neg 1 = 5) \text{ or } (7 > 5) \rightarrow \text{True}$
 $\text{Cond2} = \text{Cond1} \text{ and } (3 == 3 \text{ or } 7 != 2)$
 $\text{print(Cond1, Cond2)} \rightarrow \text{True, True}$

~~cond1~~ = ~~cond1 true~~ and ($3 == 3$ or $7 != 2$)
 print(cond1, cond2) → True and True → True
 True True

(*) b > a or a < b → a \leq b (or a \leq b)

(*) $x \geq a$ and $b \leq x$
 False a True b False

Ex age = int(input(...))

if $18 \leq \text{age}$ and $\text{age} \leq 35$: ✓
 print("Adult")

Python only

if $18 \leq \text{age} \leq 35$: ✎ ✓
 print("Adult")

Grading Question

- A if score ≥ 80
- B if $70 \leq \text{score} < 80$
- C if $60 \leq \text{score} < 70$
- F if $\text{score} < 60$
- input: or 66666

① If and
 $\text{score} = \text{float}(\text{input}(...))$
 if $\text{score} \geq 80$:
 print('A')
 if $70 \leq \text{score} < 80$:
 print('B')
 if $60 \leq \text{score} < 70$:
 print('C')
 if $\text{score} < 60$:
 print('F')

② $\text{score} = \text{float}(\text{input}(...))$

```

if score >= 80:
    print('A')
else:
    if score >= 70:
        print('B')
    else:
        print('C')

```

score
if 79
if 70
if 60
if 7

score
if -

els

$= 79$

$>= 80 \Rightarrow \text{False}$

$\underline{\leq 79 < 80.}$

$\frac{\text{int('B')} \rightarrow B}{\text{True}}$

$\underline{\leq 79 \leq 70.}$

$i < 60 :$
 X

$c = 78$

$\underline{78 >= 80}$
 $\underline{\text{False}}$

$e:$

\downarrow

$\text{if } \underline{78 >= 70:}$

$\quad \underline{\text{print('B')}} \rightarrow B$

$\text{else: } X$

else: ← score < 70 ←

if score ≥ 60 :
print('C')

else:
print('F')

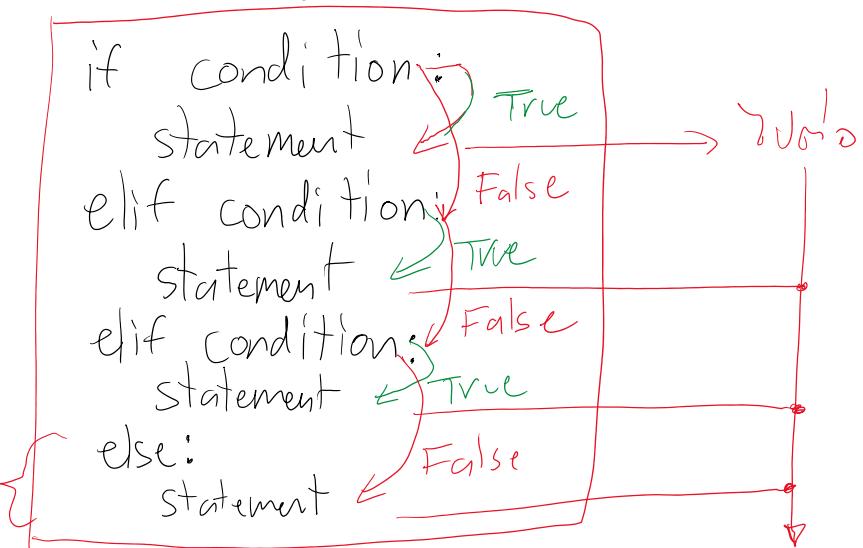
if - elif - else structure

↳ បើក ស្រួល យុទ្ធសាស្ត្រ នៃការ ឲ្យ គាំរូ

↳ រួចរាល់ ឱ្យ បង្កើត ស្រួល ឬ ចំណាំ

Syntax:

យុទ្ធសាស្ត្រ



③

score = float(input(...))

ស្រួល
បានទៅ

if score ≥ 80 :
print('A')
elif score ≥ 70 :
print('B')
elif score ≥ 60 :
print('C')

else:

score = 78

if 78 $\geq 80 \rightarrow$ False

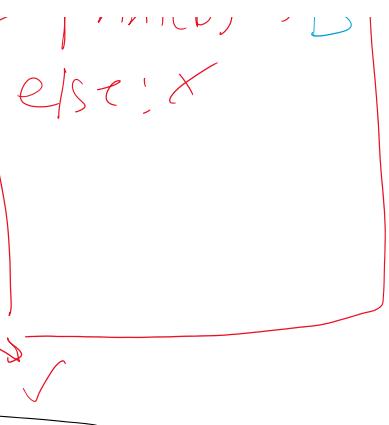
X

elif 78 $\geq 70 \rightarrow$ True

print('B')

B

କେବୁ କିମ୍ବା କେବୁ ?
କାହାରେ ଗପିବାକୁ ପାଇବା
ପାଇବାକୁ କିମ୍ବା କେବୁ ?
କାହାରେ ଗପିବାକୁ ପାଇବା
କାହାରେ



```
    printf('C')  
else:  
    printf('F')
```

```
T print('c')  
|  
| else:  
| | print('F')  
| | ..
```

A hand-drawn diagram illustrating a control flow graph node. The node contains the code: T print('c') on top, followed by an empty line, then else:, another empty line, and finally print('F') at the bottom. A red bracket on the left side groups the first two lines. A red arrow originates from the 'T' in 'T print...' and points to the start of the 'else:' line. A blue arrow originates from the 'print('F')' line and points to a blue box containing the letter 'C'. Above the box 'C' are three small blue 'v' symbols pointing downwards.