CSIT110

Fundamental Programming with Python

Conditional Statement

Goh X. Y.

In this lecture

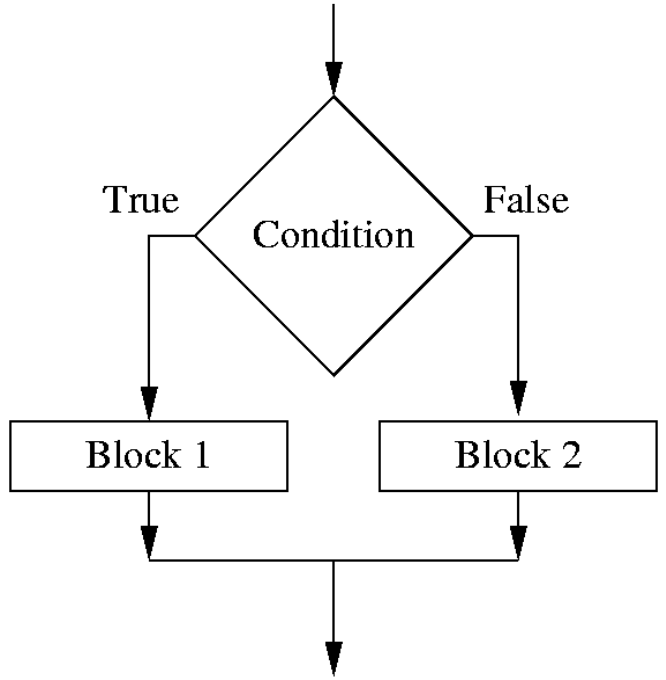
- Decision making: if - else
- Block of codes and Indentation
- Naming conventions

if - else

How does it look like?

```
if (some condition):
    # block statements if condition
    # is True

else:
    # block statements if condition
    # is False
```



Blocks and Indentation

```
if (some condition):
    this is
    a block
    of codes
    that is indented
    by the same amount
    of spaces
else:
    usually
    we use 2, 3 or 4 spaces for
    indentation
```

In Python, all the continuous lines indented with same number of spaces form a **block**.

All statements within the block must be indented the same amount.

We usually use 2, 3 or 4 spaces for indentation.

Common Mistakes

Forget the colon **:**

```
if (some condition):
    this is
    a block
    of codes
    that is indented
    by the same amount
    of spaces
else:
    usually
    we use 2, 3 or 4 spaces for
    indentation
```

What happens when there is no indent:

```
    ^
IndentationError: expected an indented block
>
```

Wrong indentation,
mix-up between spaces and tabs
miix-up number of spaces

Make your choice of indentation and use it consistently!

Blocks and Indentation

```
if (some condition):
#{
  this is
  a block
  of codes
  that is indented
  by the same amount
  of spaces
#}
else:
#{
  usually
  we use 2, 3 or 4 spaces for
  indentation
#}
```

If you are coming from C, C++, Java, etc... background, perhaps using the above coding style will help you!

If - else – Example 1

Number of items	**Cost**
1-50	$3 per item Postage: $10
More than 50	$2 per item Postage: free

If - else – Example 1

Number of items	Cost
1-50	$3 per item Postage: $10
More than 50	$2 per item Postage: free

If the user buys 10 item:

```
Item cost = $3 x 10 = $30
Postage: $10

Total cost: $40
```

If - else – Example 1

Number of items	Cost
1-50	$3 per item Postage: $10
More than 50	$2 per item Postage: free

If the user buys 100 item:

```
Item cost = $2 x 100 = $200
Postage: $free

Total cost: $200
```

If - else – Example 1

```
# get the number of items from the user

item_input = input("Enter the quantity: ")
item_count = int(item_input)

# calculate the cost

if (item_count <= 50):
    
    

else:
    
    
```

If - else – Example 1

```
# get the number of items from the user

item_input = input("Enter the quantity: ")
item_count = int(item_input)

# calculate the cost

if (item_count <= 50):
    unit_price = 3
    postage = 10
    total_cost = unit_price * item_count + postage
    print("Total cost: ${0}".format(total_cost))

else:

```

If - else – Example 1

```
# get the number of items from the user

item_input = input("Enter the quantity: ")
item_count = int(item_input)

# calculate the cost

if (item_count <= 50):
    unit_price = 3
    postage = 10
    total_cost = unit_price * item_count + postage
    print("Total cost: ${0}".format(total_cost))

else:
    unit_price = 2
    total_cost = unit_price * item_count

    print("Total cost: ${0}".format(total_cost))
```

If - else – Example 1

```
# get the number of items from the user

item_input = input("Enter the quantity: ")
item_count = int(item_input)

# calculate the cost

if (item_count <= 50):
#{
    unit_price = 3
    postage = 10
    total_cost = unit_price * item_count + postage
    print("Total cost: ${0}".format(total_cost))
}#
else:
#{
    unit_price = 2
    total_cost = unit_price * item_count

    print("Total cost: ${0}".format(total_cost))
}#
```

if - elif - elif - … - else

if - elif - elif - … - else

```
if (condition1):
    # condition1 is true
    statement
    statement
    ...
elif (condition2):
    # condition1 is false and condition2 is true
    statement
    statement
    ...
elif (condition3):
    # condition1 is false, condition2 is false, and condition3 is true
    statement
    statement
    ...
else:
    # all the conditions are false
    statement
    statement
    ...
```

Example 2

Number of items	Cost
1-50	$3 per item Postage: Standard post: $10 Registered post: $15 Express post: $20
More than 50	$2 per item Postage: Standard post: free Registered post: $15 Express post: $20

10 items + Registered Post

```
Item cost = $3 x 10 = $30
Postage: $15
Total cost: $45
```

Example 2

Number of items	Cost
1-50	$3 per item Postage: Standard post: $10 Registered post: $15 Express post: $20
More than 50	$2 per item Postage: Standard post: free Registered post: $15 Express post: $20

100 items + Registered Post

```
Item cost = $2 x 100 = $200
Postage: $15
Total cost: $215
```

Example 2

Number of items	Cost
1-50	$3 per item Postage: Standard post: $10 Registered post: $15 Express post: $20
More than 50	$2 per item Postage: Standard post: free Registered post: $15 Express post: $20

100 items + Standard Post

```
Item cost = $2 x 100 = $200
Postage: free
Total cost: $200
```

Example 2

```
# get the number of items from the user
item_input = input("Enter the quantity: ")
item_count = int(item_input)

# get the shipping method Standard/Registered/Express?
shipping = input("Shipping method (s/r/e): ")

# calculate the cost
```

Example 2

```
# calculate the cost

# determine the unit price



# determine the postage



# determine the total cost
```

Example 2

```
# determine the unit price

if (item_count <= 50):
    unit_price = 3

else:
    unit_price = 2
```

Example 2

```
# determine the postage
if (shipping == "s"):
    # standard



elif (shipping == "r"):
    # registered post

else:
    # express post

```

Example 2

```
# determine the postage
if (shipping == "s"):
    # standard post $10 for 1-50 items, free for > 50 items
    if (item_count <= 50):
        postage = 10
    else:
        postage = 0

elif (shipping == "r"):
    # registered post

else:
    # express post
```

Example 2

```
# determine the postage
if (shipping == "s"):
    # standard post $10 for 1-50 items, free for > 50 items
    if (item_count <= 50):
        postage = 10
    else:
        postage = 0

elif (shipping == "r"):
    # registered post $15
    postage = 15
else:
    # express post
```

Example 2

```
# determine the postage
if (shipping == "s"):
    # standard post $10 for 1-50 items, free for > 50 items
    if (item_count <= 50):
        postage = 10
    else:
        postage = 0

elif (shipping == "r"):
    # registered post $15
    postage = 15
else:
    # express post $20
    postage = 20
```

Example 2

```
# determine the total cost


total_cost = unit_price * item_count + postage


print("Total cost: ${0}".format(total_cost))
```

Example 3

```
# grade A: 100-80, B: 79-60, C: 59-40, D: 39-0

# ask user to enter the mark


# determine the grade based on mark


# display the mark and grade
```

Example 3

```
# grade A: 100-80, B: 79-60, C: 59-40, D: 39-0

# ask user to enter the mark

mark_input = input("Please enter mark: ")
mark = int(mark_input)

# determine the grade based on mark


# display the mark and grade
```

Example 3

```
# grade A: 100-80, B: 79-60, C: 59-40, D: 39-0

# determine the grade based on mark


if (mark >= 80):
    grade = "A"
elif (mark >= 60):
    grade = "B"
elif (mark >= 40):
    grade = "C"
else:
    grade = "D"
```

Example 3

```
# display the mark and grade

print("Mark {0}, Grade {1}".format(mark, grade))
```

Example 3

```
# grade A: 100-80, B: 79-60, C: 59-40, D: 39-0
mark_input = input("Please enter mark: ")
mark = int(mark_input)
if (mark >= 80):
    grade = "A"
elif (mark >= 60):
    grade = "B"
elif (mark >= 40):
    grade = "C"
else:
    grade = "D"
print("Mark {0}, Grade {1}".format(mark, grade))
```

mark is greater than or equal to 80

```
Please enter mark: 90
Mark 90, Grade A
```

Example 3

```
# grade A: 100-80, B: 79-60, C: 59-40, D: 39-0
mark_input = input("Please enter mark: ")
mark = int(mark_input)
if (mark >= 80):
    grade = "A"
elif (mark >= 60):
    grade = "B"
elif (mark >= 40):
    grade = "C"
else:
    grade = "D"
print("Mark {0}, Grade {1}".format(mark, grade))
```



```
Please enter mark: 62
Mark 62, Grade B
```

Example 3

```
# grade A: 100-80, B: 79-60, C: 59-40, D: 39-0
mark_input = input("Please enter mark: ")
mark = int(mark_input)
if (mark >= 80):
    grade = "A"
elif (mark >= 60):
    grade = "B"
elif (mark >= 40):
    grade = "C"
else:
    grade = "D"
print("Mark {0}, Grade {1}".format(mark, grade))
```

```
Please enter mark: 45
Mark 45, Grade C
```

Example 3

```
# grade A: 100-80, B: 79-60, C: 59-40, D: 39-0
mark_input = input("Please enter mark: ")
mark = int(mark_input)
if (mark >= 80):
  grade = "A"
elif (mark >= 60):
  grade = "B"
elif (mark >= 40):
  grade = "C"
else:
  grade = "D"
print("Mark {0}, Grade {1}".format(mark, grade))
```

```
Please enter mark: 15
Mark 15, Grade D
```

if (alone)

```
if (some condition):
  statements
  ...
```

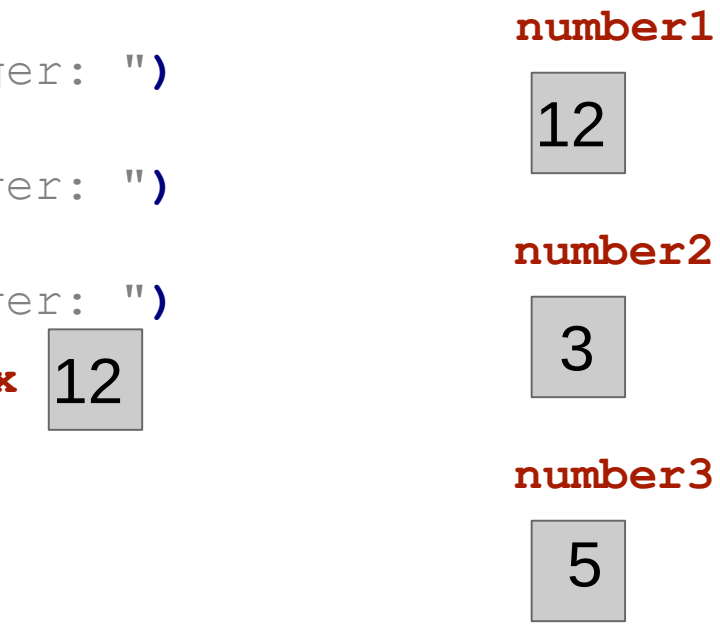
```
user_input = input("Enter the 1st integer: ")
number1 = int(user_input)
user_input = input("Enter the 2nd integer: ")
number2 = int(user_input)
user_input = input("Enter the 3rd integer: ")
number3 = int(user_input)
number_max = number1
if (number2 > number_max):
    number_max = number2
if (number3 > number_max):
    number_max = number3

print("Max of {0}, {1}, {2} is\ {3}".format(number1,
      number2, number3, number_max))
```

What is this program trying to do?

```
user_input = input("Enter the 1st integer: ")
number1 = int(user_input)
user_input = input("Enter the 2nd integer: ")
number2 = int(user_input)
user_input = input("Enter the 3rd integer: ")
number3 = int(user_input)
number_max = number1
if (number2 > number_max):
    number_max = number2
if (number3 > number_max):
    number_max = number3

print("Max of {0}, {1}, {2} is\ {3}".format(number1,
      number2, number3, number_max))
```

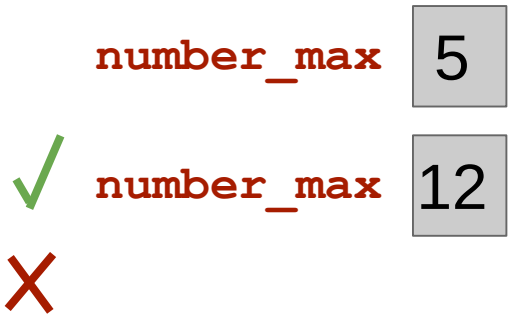


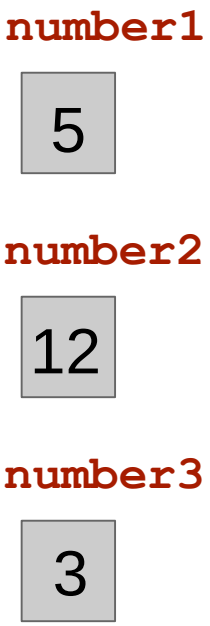
senario 1

```
Enter the 1st integer: 12
Enter the 2nd integer: 3
Enter the 3rd integer: 5
Max of 12, 3, 5 is 12
```

```
user_input = input("Enter the 1st integer: ")
number1 = int(user_input)
user_input = input("Enter the 2nd integer: ")
number2 = int(user_input)
user_input = input("Enter the 3rd integer: ")
number3 = int(user_input)
number_max = number1
if (number2 > number_max):
    number_max = number2
if (number3 > number_max):
    number_max = number3

print("Max of {0}, {1}, {2} is\ {3}".format(number1,
      number2, number3, number_max))
```



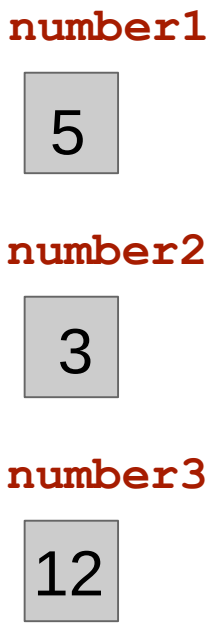


senario 2

```
Enter the 1st integer: 5
Enter the 2nd integer: 12
Enter the 3rd integer: 3
Max of 5, 12, 3 is 12
```

```
user_input = input("Enter the 1st integer: ")
number1 = int(user_input)
user_input = input("Enter the 2nd integer: ")
number2 = int(user_input)
user_input = input("Enter the 3rd integer: ")
number3 = int(user_input)
number_max = number1
if (number2 > number_max):
    number_max = number2
if (number3 > number_max):
    number_max = number3

print("Max of {0}, {1}, {2} is\ {3}".format(number1,
      number2, number3, number_max))
```



number_max 5

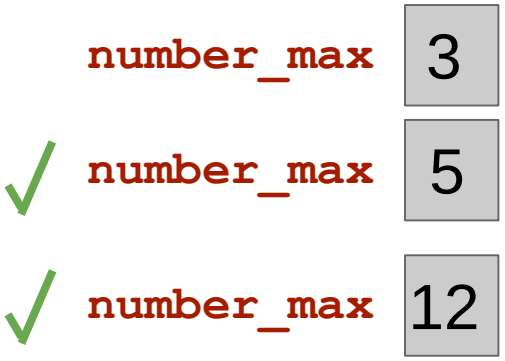
number_max 12

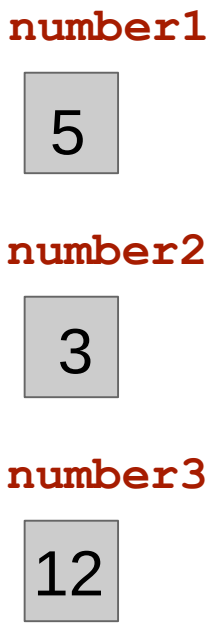
senario 3

```
Enter the 1st integer: 5
Enter the 2nd integer: 3
Enter the 3rd integer: 12
Max of 5, 3, 12 is 12
```

```
user_input = input("Enter the 1st integer: ")
number1 = int(user_input)
user_input = input("Enter the 2nd integer: ")
number2 = int(user_input)
user_input = input("Enter the 3rd integer: ")
number3 = int(user_input)
number_max = number1
if (number2 > number_max):
    number_max = number2
if (number3 > number_max):
    number_max = number3

print("Max of {0}, {1}, {2} is\ {3}".format(number1,
      number2, number3, number_max))
```





senario 4

```
Enter the 1st integer: 3
Enter the 2nd integer: 5
Enter the 3rd integer: 12
Max of 3, 5, 12 is 12
```

Equality

Remember the double equal sign ==

```
if (number1 == 5):
    # number1 is equal to 5
if (number1 == number2):
    # number1 is equal to number2
if (your_answer == "Y"):
    # your_answer is equal to "Y"
if (student_name == "John"):
    # student_name is equal to "John"
```

Inequality

```
if (number1 != 5):
    # number1 is equal to 5
if (number1 != number2):
    # number1 is equal to number2
if (your_answer == "Y"):
    # your_answer is equal to "Y"
if (student_name == "John"):
    # student_name is equal to "John"
```

Comparison

```
if (number1 < 5):
    # number1 is less than 5
if (number1 <= 5):
    # number1 is less than or equal to 5
if (number1 > 5):
    # number1 is greater than 5
if (number1 >= 5):
    # number1 is greater than or equal to 5
```

Logical AND

```
if ((number1 > 5) and (number1 < 10)):
    # number1 is greater than 5 AND less than 10
if ((age > 40) and (student_type == “Domestic”)):
    # age is greater than 40 # AND student_type is equal
    to “Domestic”
```

Logical OR

```
if ((number1 < 1000) or (number1 > 5000)):
    # number1 is less than 1000 # OR greater than 5000
if ((student_type == “Exchange”) or (student_type == “Domestic”)):
    # student_type is equal to “Exchange” # OR is equal to “Domestic”
```

Logical Negation

```
if (not (number1 == 1000)):
    # number1 is not equal to 1000
```

Operator (other languages)	Operator (Python)
&&	and
||	or
!	not

Any questions?