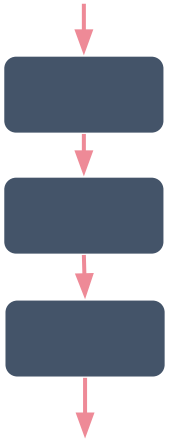
Faculty of
Information Technology
King Mongkut's Institute of Technology Ladkrabang

Python Crash Course

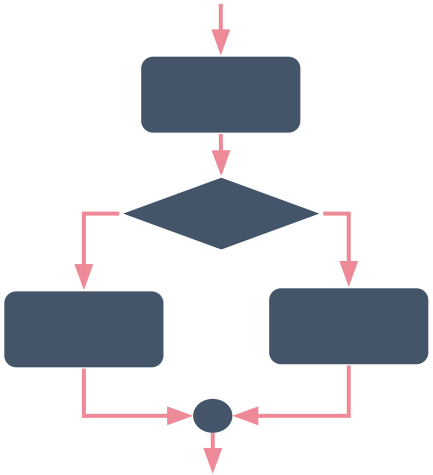
Dr. Sirasit Lochanachit

06036120 Data Structures and Algorithms Principles

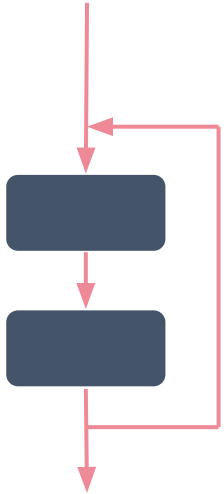
Control Flow



Sequence

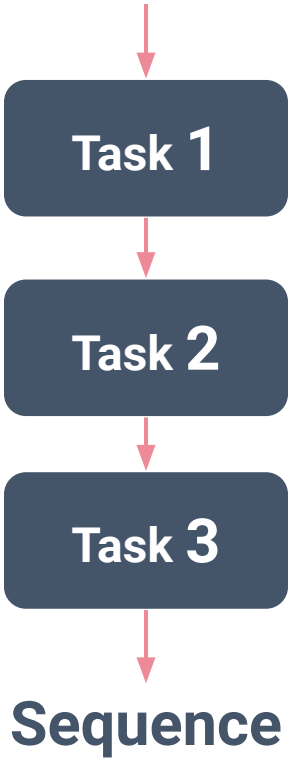


Selection



Iteration

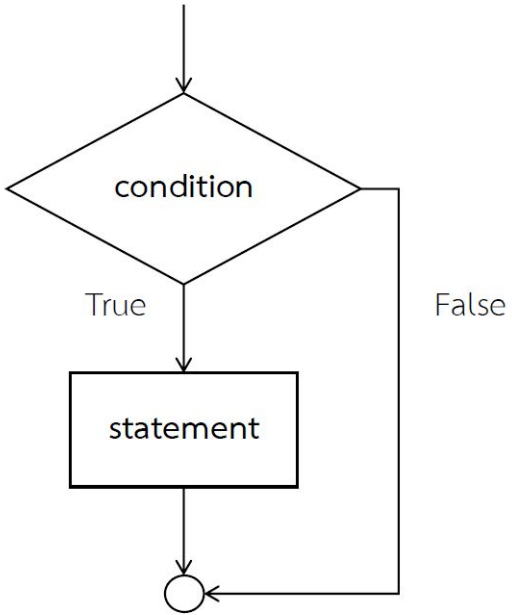
Sequential Structure



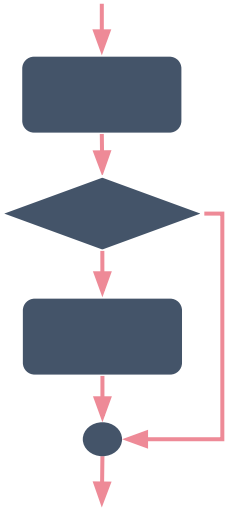
Selection Structure

```
if <condition>:
    <statements>
```

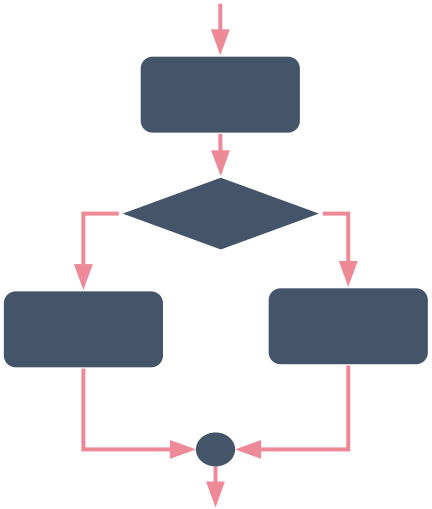
```
x = 10
if x < 15:
    print("x is less than 15")
    print("OK")
print("Thank you")
```



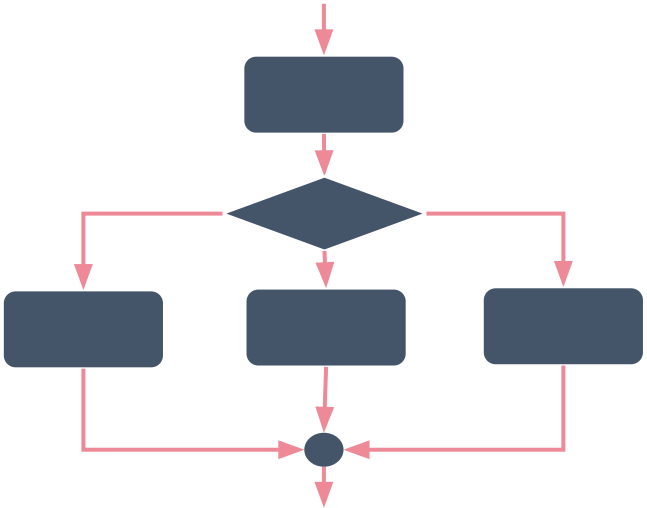
Selection Structure



Single Selection



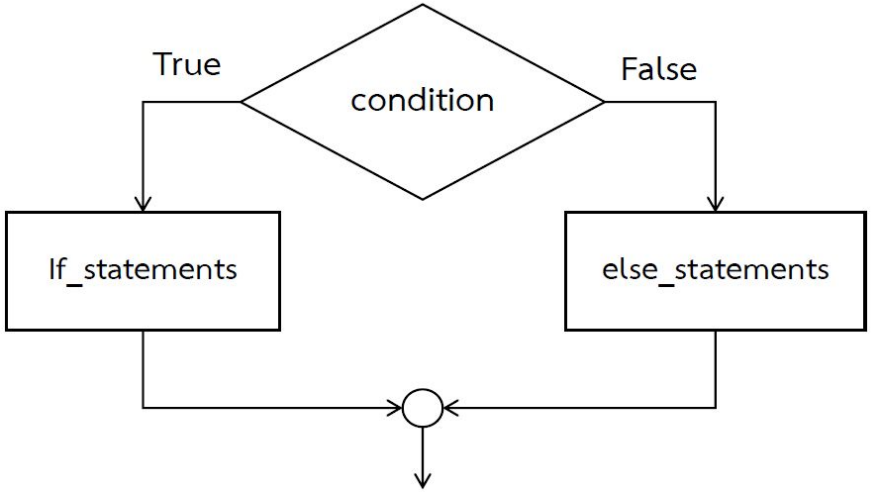
Double Selection



Multiple Selection

If/Else Statement

```
if <condition>:
    <if_statements>
else:
    <else_statements>
```



If/Else Statement

```
money = 300
if money >= 350:
    print('You can buy this item')
else:
    print('You don\'t have sufficient money to buy this bag')
```

Selection: Even or Odd

Exercise 3

Write a program to calculate an area of a triangle by accepting a height and a width (base) of a triangle.

A program will have to verify that accepted inputs are positive numbers. Otherwise, it should display “Height and width should be positive numbers”

- Example input: triangle(10, 12)
- Expected output:
  - A triangular area is 60

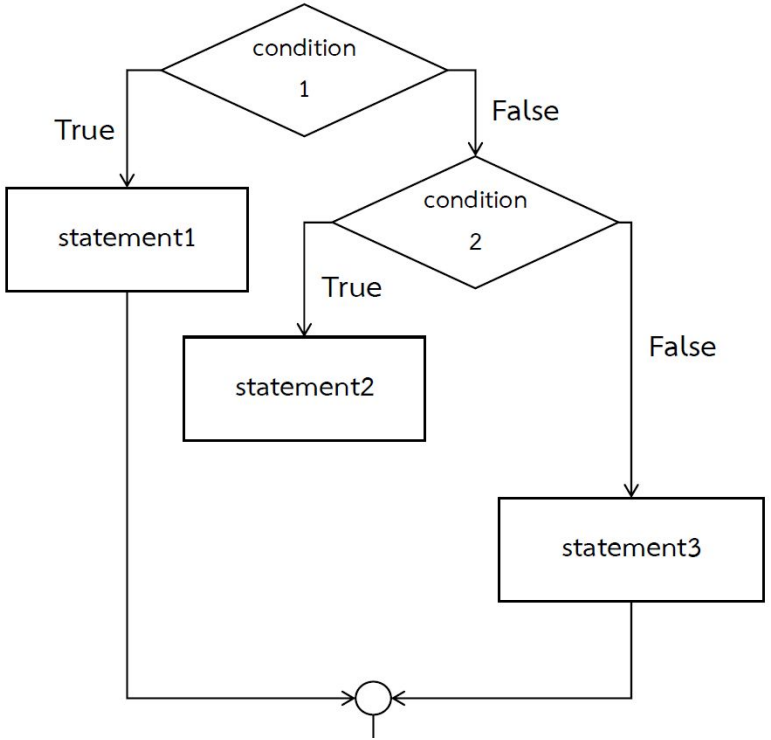
Example input: triangle(-5, 20)

Expected output:

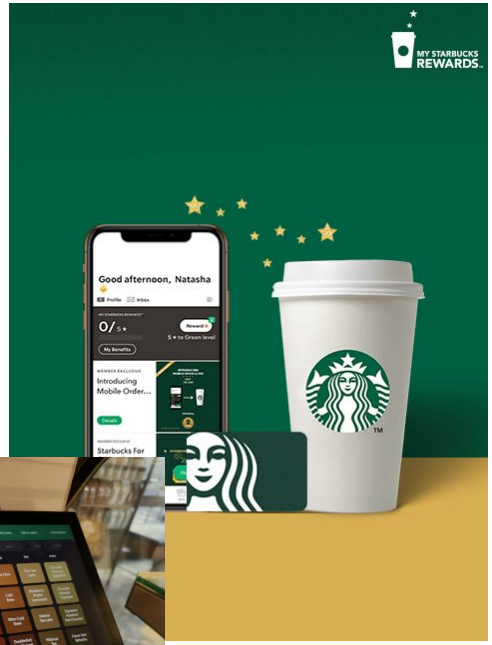
Height and width should be positive numbers

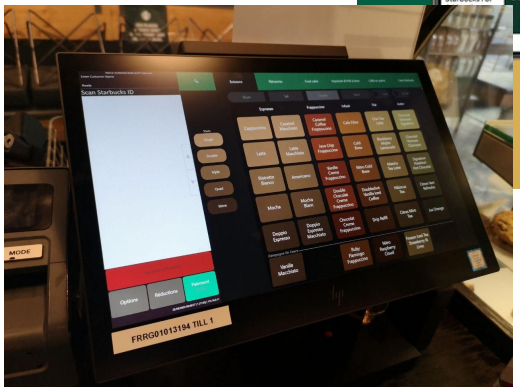
If-Elif Statement

```
if <condition1>:
        <statement_1>
elif <condition2>:
        <statement_2>
...
else:
        <statement_n>
```



Selection: Rewards



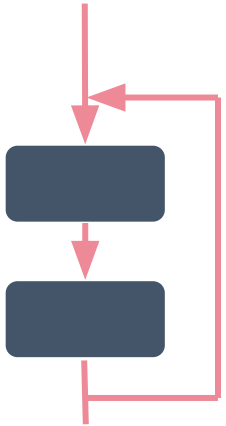


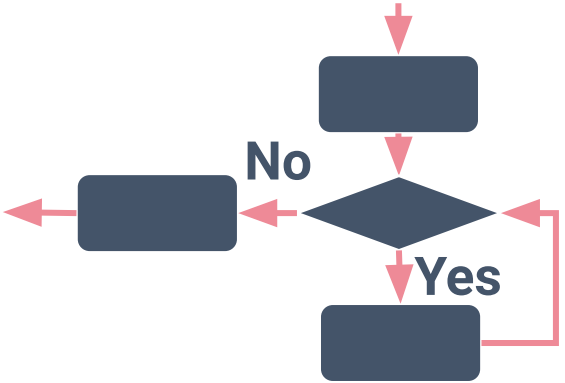
Exercise 4: Grading

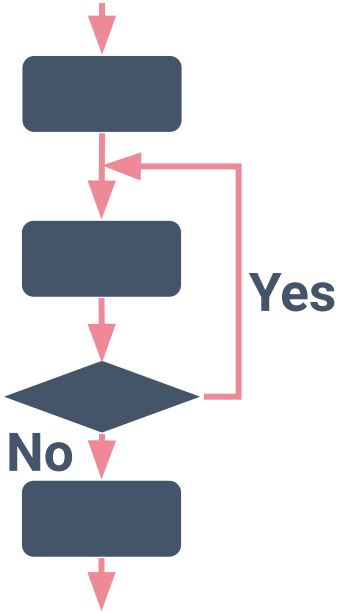
Write a program to return an appropriate grade given a score according to the table below.

Grade	Score
A	80-100
B	70-79
F	0-69
Not in range	Outside 0-100

Iteration







Infinite Loop

Finite Loop

Repetition Structure

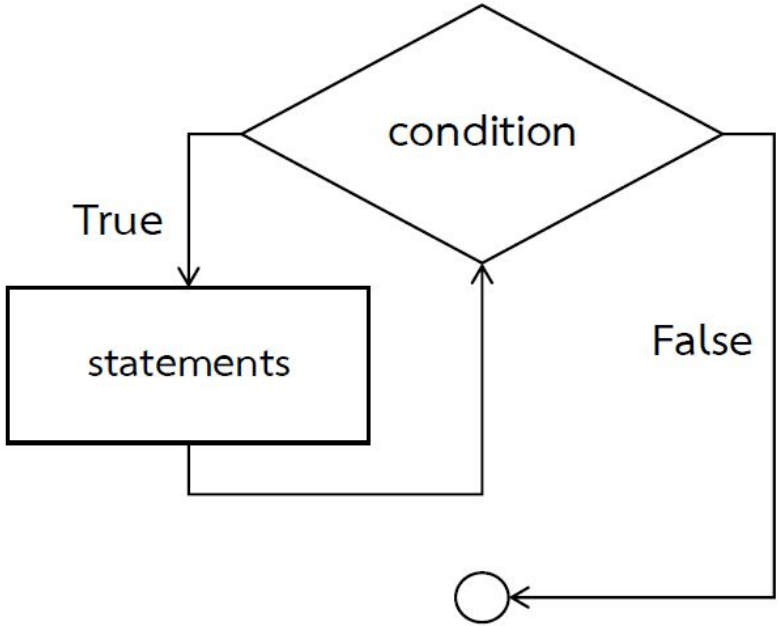
while loop

for loop

While Statement

```
while <condition>:
        <statements>


i = 1
while i <= 10:
        print(i, end = ‘, ‘)
        i = i + 1
```



Iteration: Input Range

A program that accepts input between 1 and 100 only.

Exercise 5: Grading

Modify the program in Exercise 4 so that it should iterate the input until -1 is given to stop the program and print “Thank you” message.

Grade	Score
A	80-100
B	70-79
F	0-69
Not in range	Outside 0-100

For Statement

```
for variableName in groupOfValues:
    <statements>


for x in range(1, 6):
    print(x, 'squared is', x*x)
```

range()

range(start, end, step)

```
list(range(10))
list(range(1, 11))
list(range(0, 30, 5))
list(range(0, -10, -1))
```

For Statement

```
for i in range(10, 0, -1):
        print(i, end= ‘, ’)


names = [‘Jane’, ‘John’, ‘Eric’, ‘Elon’]
for i in range(len(names):
        print(names[i], end = ‘, ‘)
```

Exercise 6: Control Flow

Write a flowchart describing the logic of factorial function which accepting a number as an input.

- Example
  - Enter factorial number: 6
  - The result is 720

Hint: The factorial n!, is the product of all positive integers less than or equal to n.
*For example: 5! = 5 * 4 * 3 * 2 * 1 = 120*

Exercise 6: Control Flow

Function

```
def function_name(args…):
    <statements>

def function_name(args…):
    <statements>
    return value
```

Function

```
def hello(name):
    print("Hello", name)

def area(width, height):
    c = width * height
    return c
```