



Information Technology

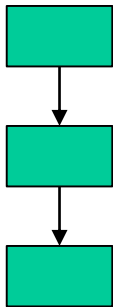
Year 2020/2021

Introduction to Programming

Programming Control Structures

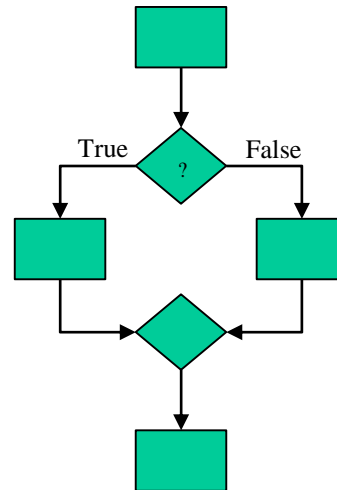
Programming Control Structures

Sequence



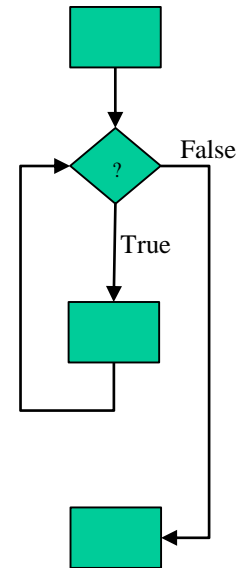
Normal flow of execution.
Each instruction is executed before the next

Decision



if
if / else
if / elif / else

Cycle



for: using lists, sets, tuples
for: using ranges
while



1911

Decision

```
In [1]: whatToTest = input("What do you want to test?:")

if whatToTest in "aeiouAEIOU":
    print("%s is a vowel" % whatToTest)
else:
    print("%s is NOT vowel" % whatToTest)
```

```
What do you want to test?:E
E is a vowel
```

```
In [2]: whatToTest = input("What do you want to test?:")

if whatToTest in "aeiouAEIOU":
    print("%s is a vowel" % whatToTest)
elif whatToTest in "0123456789":
    print("%s is a number" % whatToTest)
else:
    print("%s is neither a vowel nor a number" % whatToTest)
```

```
What do you want to test?:X
X is neither a vowel nor a number
```



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Cycle FOR

- Cycle “for”
 - List
 - set
 - tuple

```
In [1]: myList = ["Mon", "Tue", "Wed", "Thu", "Fri"]  
myTuple = ("Mon", "Tue", "Wed", "Thu", "Fri")  
mySet = {"Mon", "Tue", "Wed", "Thu", "Fri"}
```

```
In [2]: for i in myList:  
        print(i)
```

```
Mon  
Tue  
Wed  
Thu  
Fri
```

```
In [3]: for j in myTuple:  
        print(j)
```

```
Mon  
Tue  
Wed  
Thu  
Fri
```

```
In [4]: for k in mySet:  
        print(k)
```

```
Mon  
Tue  
Thu  
Wed  
Fri
```



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Cycle FOR with “range”

- Use `range(initial, final, step)`
 - “step” is optional. If omitted, assumed “1”

Attention: The Range will be:
Initial \leq I $<$ final

```
In [1]: for i in range(10, 20, 2):  
        print(i)
```

```
10  
12  
14  
16  
18
```

```
In [2]: for i in range(30, 20, -2):  
        print(i)
```

```
30  
28  
26  
24  
22
```



1911

Cycle “While”

```
In [5]: count = 1
while count <= 5:
    print(count)
    count += 1
```

1
2
3
4
5

```
In [1]: print("-----hellow-----")
while True:
    stuff = input("String to capitalize [type q to quit]: ")
    if stuff == "q":
        print("-----goodbye-----")
        break
    print(stuff.capitalize())
```

```
-----hellow-----
String to capitalize [type q to quit]: Does it work?
Does it work?
String to capitalize [type q to quit]: yes it does
Yes it does
String to capitalize [type q to quit]: q
-----goodbye-----
```

Contributors

- List of authors/contributors to these materials:
 - Jesualdo Fernandes (2019)
 - Paulo Simões (2020)

- Credits
 - Part of these slides were based on previous work from Prof. Carlos Costa (ISEG)