Loops

Repeated steps
Increment and decrement

\[ x = x + 1 \quad \quad \quad \quad \quad x = x - 1 \]
\[ x += 1 \quad \quad \quad \quad \quad x -= 1 \]

\[ a *= 2 \quad \quad \quad \quad \quad a = a \times 2 \]
\[ a /= 10 \quad \quad \quad \quad \quad a = a / 10 \]
\[ a %= 3 \quad \quad \quad \quad \quad a = a \% 3 \]
\[ a **= 2 \quad \quad \quad \quad \quad a = a ** 2 \]
Indefinite loops (while)

while condition:
  statement
  statement

  a = 0  # iteration variable
while a < 5:
  print 'Hello'
  a += 1
Infinite loops

```python
a = 0
while True:
    print 'Hello'
    a += 1
if a == 5:
    break
```
Boolean expressions

• Constants
  • True
  • False

• Expressions
  • $1 < 2$
  • $a > 0$

• Type 'bool'
  >>> type(True)
  <type 'bool'>
  >>> type(1+2==3)
  <type 'bool'>
Statement continue

```python
a = 0
while a < 10:
    a += 1
    if a % 2 == 0:
        continue
    print a
```
Changing iteration variable more than by 1

```python
a = 1
while a < 10:
    print a
    a += 2
```
Definite loops (for)

```python
for variable in list:
    statement
    statement

for a in [1, 2, 3, 4, 5]:  # a is iteration variable
    print 'Hello'

students = ['Joseph', 'Glenn', 'Sally']
for student in students:
    print 'Good morning,', student
print 'Done!'
```
Constant value None

```python
>>> type(None)
<type 'NoneType'>
```

- Variable doesn’t have a value
  ```python
  largest_so_far = None
  ```
- Function doesn’t return a value
  ```python
def printA():
    print 'A'
  ```
```python
print printA()
A None
```
Operator is

• can be used in logical expressions
• “is the same as”
• similar to, but stronger than ==
• it is always better to use ==
  >>> 4 == 4.0
  True
  >>> 4 is 4.0
  False
• is not is similar to !=
Reserved words

while
break
continue
for
in
True
False
None
is
Homework (part of the multiplication table, number of days in months)

Questions?
Test 4

Questions?
Exercises

https://courses.cs.ut.ee/2017/nkp/fall/Main/During4