Lecture 14

Topics to be covered:

Chapter 9:

- Loops
- While loops
- More while examples
- Counting

Loops

What is a loop?

Loops are all about repeating the same behavior for some number of times or until some condition is met.

Loops

Two types of loop in Python

In Python we have two types of loops:

while loop: executes a block of code as long as the loop's expression is True.

```
while <condition>:
   # loop body
   # loop body

# statements to execute when condition
# becomes False
```

Loops

Two types of loop in Python

In Python we have two types of loops:

for loop: a counted loop, executes a block of code n times

```
for variable in container:
    # Loop body
    # Loop body

# Statements to execute after the for loop
# is complete
```

While loops

While loops

Let’s start with while loops :

While loops

While loops

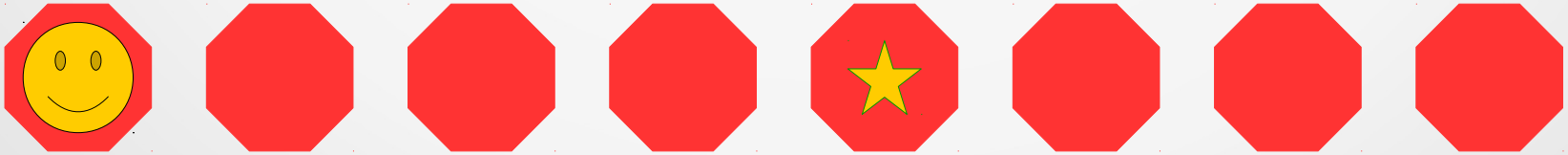
Let’s start with while loops :

While loops

While loops

Let’s start with while loops :

```
jump
jump
jump
jump
jump
```



While loops

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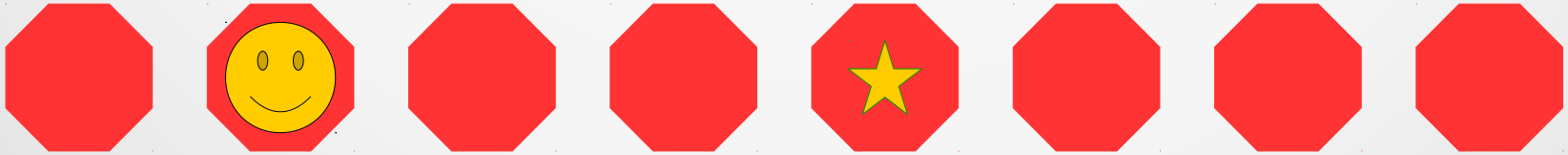

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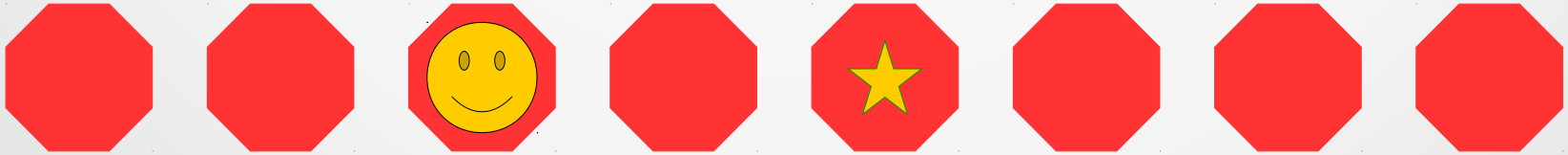

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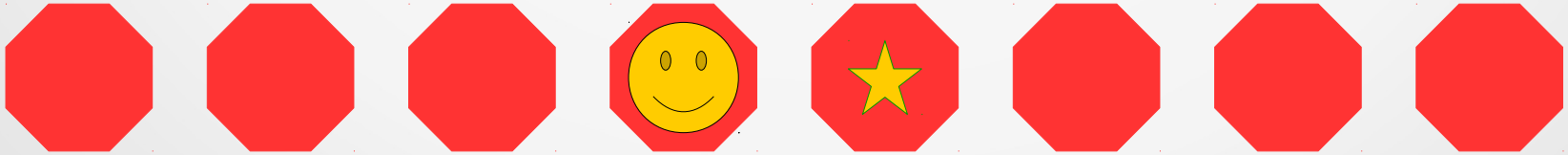

While loops

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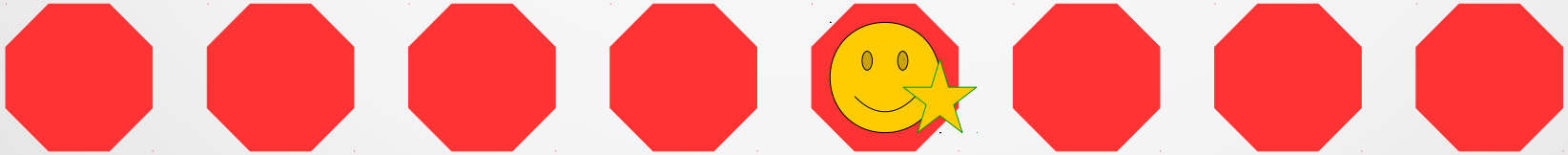


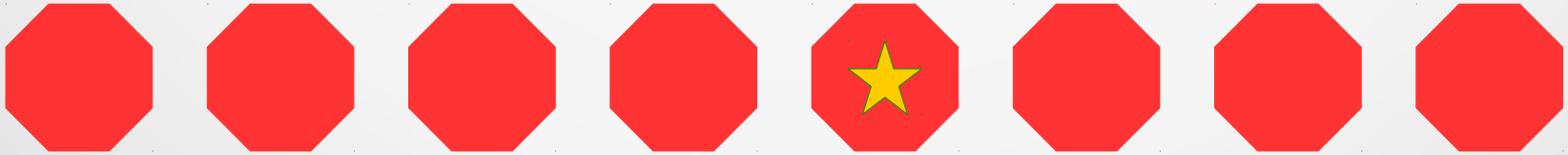
While loops

While loops

Let’s start with while loops :

while the star is not reached:

jump



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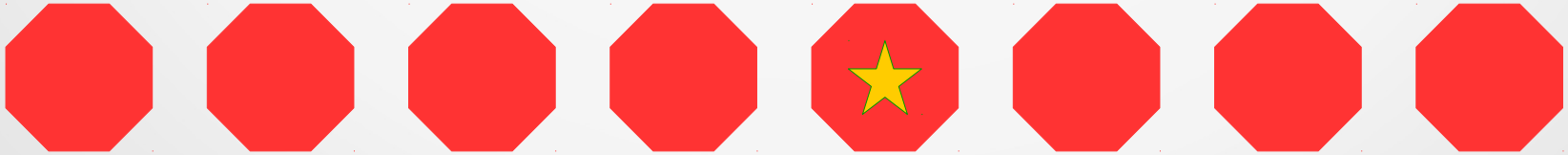

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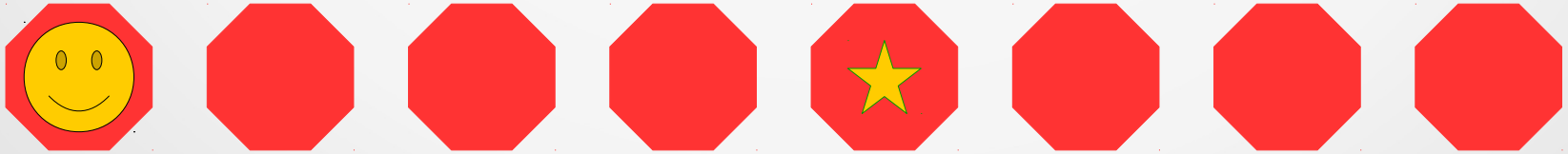

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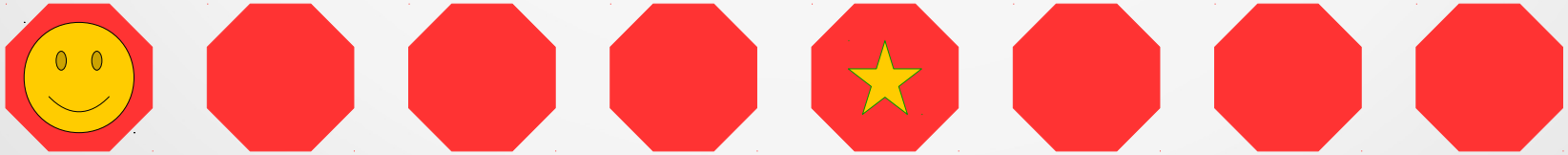

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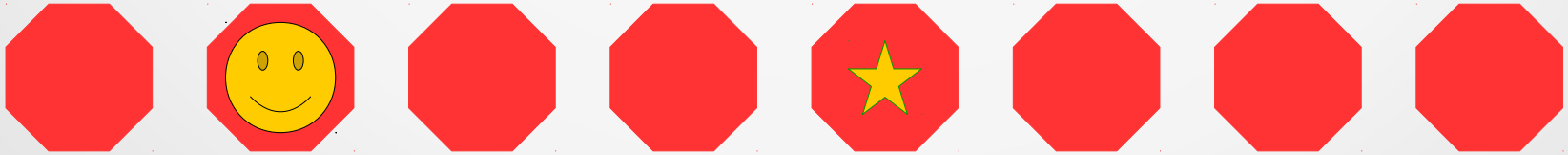

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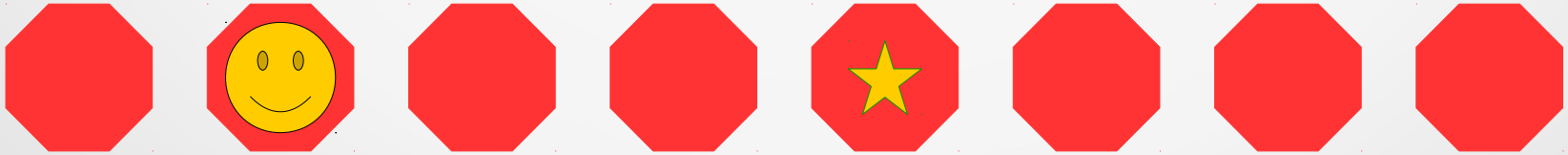

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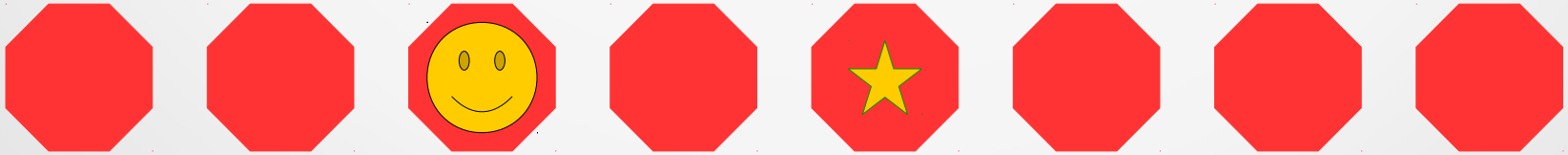

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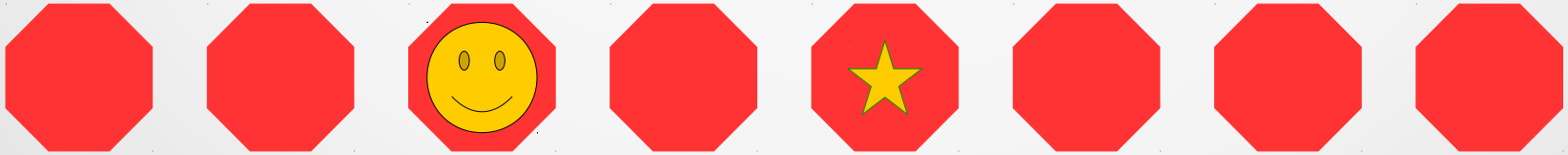

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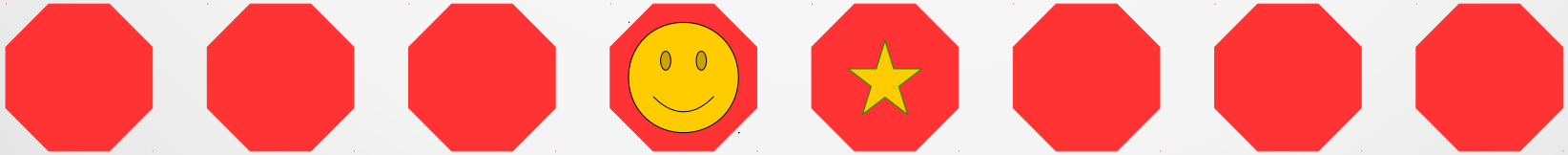

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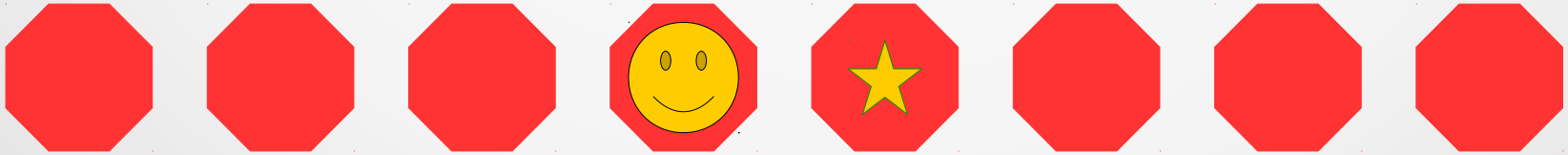

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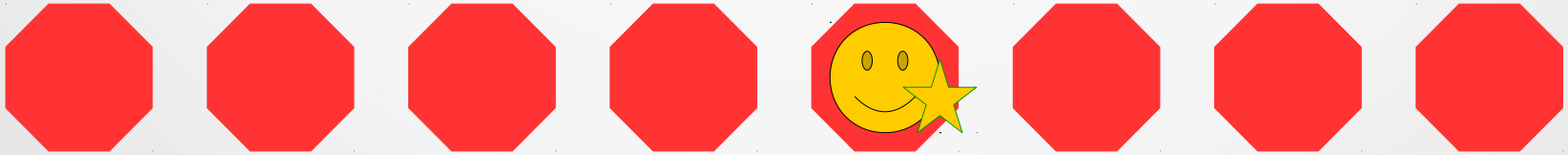

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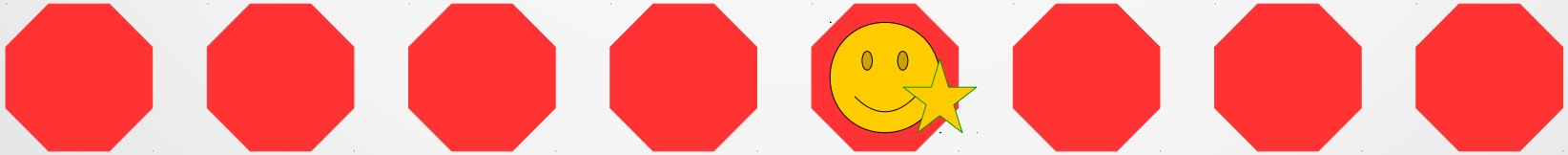

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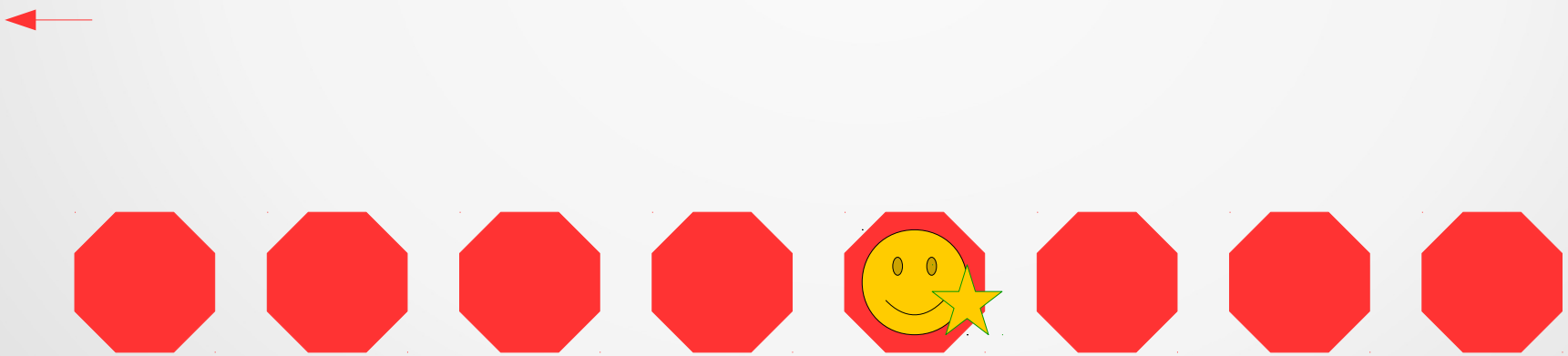

While loops

While loops

Let's start with while loops.

```
x = int(input("Enter a positive integer:"))

while x > 0:
   print("***")
   x = x - 3
print("the end")
```

While loops

While loops

Let's start with while loops.

```
x = int(input("Enter a positive integer:"))

while x > 0:
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    x = x - 3
print("the end")
```

```
Enter a positive integer:
```

While loops

While loops

Let's start with while loops.

```
x = int(input("Enter a positive integer:"))

while x > 0:
   print("***")
   x = x - 3
print("the end")
```

```
Enter a positive integer:7
```

While loops

While loops

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while x > 0:
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```

```
Enter a positive integer:7
```

x=7

While loops

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while x > 0:
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```

```
Enter a positive integer:7
***
```

x=7

While loops

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```
x = int(input("Enter a positive integer:"))

while x > 0:
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```

```
Enter a positive integer:7
***
```

x=4

While loops

While loops

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```
x = int(input("Enter a positive integer:"))

while x > 0:
    print("***")
    x = x - 3
print("the end")
```

```
Enter a positive integer:7
***
```

x=4

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```
Enter a positive integer:7
***
***
```

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Enter a positive integer:7
***
***
```

x=1

While loops

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```

```
Enter a positive integer:7
***
***
```

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***
***
***
```

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```

```
Enter a positive integer:7
***
***
***
```

x=-2

While loops

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while x > 0:
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print("the end")
```

```
Enter a positive integer:7
***
***
***
```

x=-2

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```

```
Enter a positive integer:7
***
***
***
the end
```

x=-2

While loops

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while x > 0:
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print("the end")
```

Each execution of the loop body is called an *iteration*, and looping is also called *iterating*

While loops

While loops: common errors

An *infinite loop* is a loop that will always execute because the loop's expression is always True.

A common error is to accidentally create an infinite loop by assuming equality will be reached.

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While loops: common errors

An *infinite loop* is a loop that will always execute because the loop's expression is always True.

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While loops: common errors

An *infinite loop* is a loop that will always execute because the loop's expression is always True.

A common error is to accidentally create an infinite loop by assuming equality will be reached.

```
x = int(input("Enter a positive integer:"))

while x = 0:
   print("***")
   x = x - 3
print("the end")
```

x = 7, 4, -1, -4, ...

While Loops

While loops

Let’s take a look at the programs with various loops:

```
TurtleWithWhileLoops.py
TurtleWithWhileLoops2.py
TurtleWithWhileLoops3.py
TurtleWithWhileLoops4.py

CSI11Day14examples1.py
CSI11Day14examples2.py
CSI11Day14examples3.py
CSI11Day14examples4.py
```

While Loops

In-class activity

See the handout, work on all exercises