Announcements

- Homework
  - Homework 2 has been posted!
  - I may well still be working on getting through grading all your HW1. Hopefully by the end of today all feedback will be posted
  - If you are still working on HW1, try to get it in soon! Late days/hours are burning away!
- Remember that tutors are available Monday and Thursday nights, from 7-10pm
- Polling: `rembold-class.ddns.net`

Review Question

What will the output of the below code be upon completion?

```
x = 7
y = 0
while x >= 0:
    y = y + x
    x = x - 2
print(y)
```

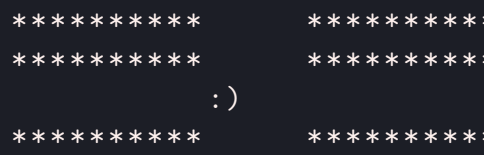
A) 15

B) 16

C) 28

D) Code will not complete (infinite loop)

Lost Woods Examples



Nesting Loops

- You are allowed to nest loops, and in many cases might want to
- Realize that one loop must finish before the next advances one iteration!
  - At which point the inner loop would run in its entirety again

```
week = 1
day = 1

while week <= 52:
    while day <= 3:
        if day == 1:
            print('Monday')
        elif day == 2:
            print('Wednesday')
        elif day == 3:
            print('Friday')

        day = day + 1
    week = week + 1
```

Taking a break

- Sometimes it can be useful to exit a loop without checking the initial test
  - Maybe you have multiple conditions that could stop the loop
  - Maybe you have a special condition that when certain requirements are met the loop ends
- The `break` statement will force an immediate exit from whatever loop it happens to be in

```
x = 1
while True:
    print(x)
    x = x + 1
    if x > 10:
        break
```

Understanding Check

What would be the *last* number printed by the below code?

```
x = 1
while x < 10:
    y = 10
    while y > x:
        if y % 3 == 0:
            break
        print(x*y)
        y = y - 2
    x = x + 1
```

A) 90
B) 60
C) 56
D) 25

Dissecting Strings

- Recall that strings are a non-scalar object
  - Made up of smaller pieces, characters in the case of strings
- Each character has an "address" within the string where it lives, called its index.

```
"Spaghetti"
```

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```
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 1 2 3 4 5 6 7 8 9
```

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Counting (and indexing) in Python always starts with 0!! This is easy to forget!

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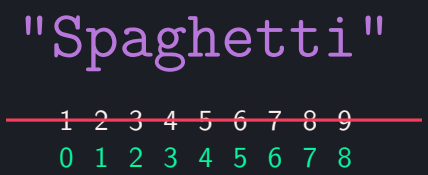

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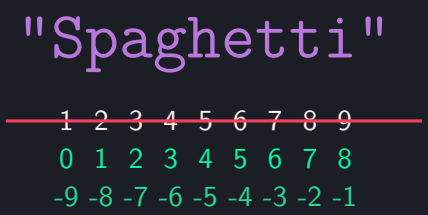

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Indexing Notation

- To get the character at a certain address or index, use *square brackets*

```
x = "Spaghetti"
```

```
0 1 2 3 4 5 6 7 8
```

- `x[0] = "S"`
- `x[4] = "h"`
- `x[-1] = "i"`
- `x[1] = "p"`

The Slicing

- Frequently, you want more than a single character
- Would be useful to give a start and stop point to extract a "sub"-string
  - Possible through slicing!
  - Notation is: `var[<start>:<stop>]`
  - Could be read as: "Get me all the characters from the `<start>` up to the `<stop>` *but not including the stop*"

```
x = "Spaghetti"

    0 1 2 3 4 5 6 7 8
```

  - `x[0:3] = "Spa"`
  - `x[4:] = "hetti"`

and the Dicing

- Slices are a form of shorthand for looping through a string and pulling out the value between two indices
- But what if you don't want *every* character between the two endpoints?
  - Only want every other character? Or every 10th character?
- Can achieve by adding one more term to our slices:

`x[<start>:<stop>:<step>]`

  - A `<step>` of 2 would take every other character
  - Default is a `<step>` of 1
  - A *negative* step will go backwards from stop to start!