LEC 03

CSE 121

Revisiting Strings and Variables

BEFORE WE START

Talk to your neighbors:

What is your favorite emoji? 😀

Respond on sli.do!

Music: 🎷 CSE 121 25au Lecture Tunes 🎶

Instructors: Brett Wortzman & James Weichert

TAs:

Trey	Ava	Caleb	Elden	Anya
Amogh	Reese	Anum	Suyash	Minh
Samrutha	Hayden	Abdul	Sthiti	TJ
Dalton	Aki	Janvi	Paul	Zach
Ailsa	Spencer	Navya	Shayna	Cayden
Ryan	Savannah	Sam	Jesse	Johnathan
Anant	Tamsyn	Jessica	Nhan	

Questions during Class?

Raise hand or send here

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Agenda

- **Announcements, Reminders**
- C0 Reflection Recap
- Typecasting
- More Variables and Operators!
- Strings and Characters Review
  - code example!

Announcements, Reminders

- **P0: Cornbear's Café released!**
  - due Tuesday, October 7th
- Expect C0 grades ~ 1 week from submission (we'll announce on Ed)
  - shortly after, your first ***resubmission*** cycle will open!

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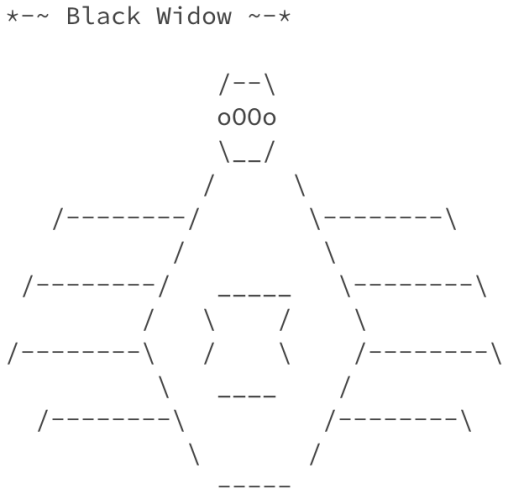
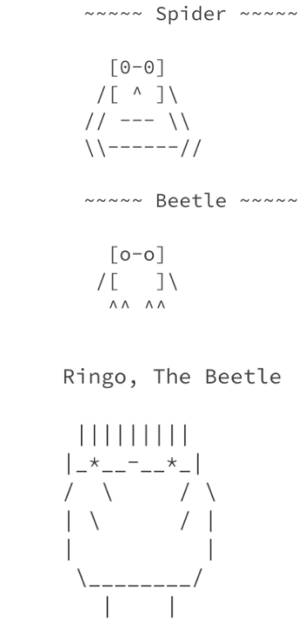
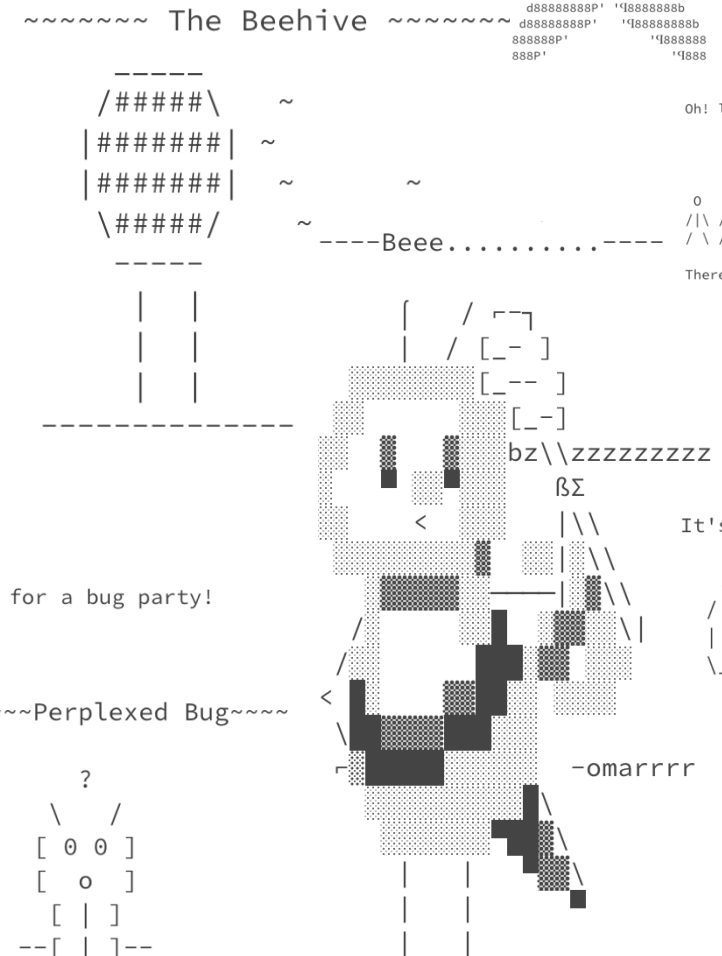
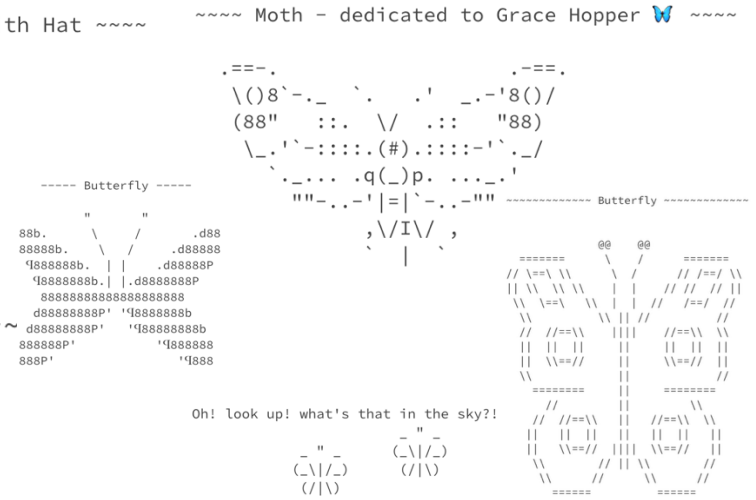
  - code example!

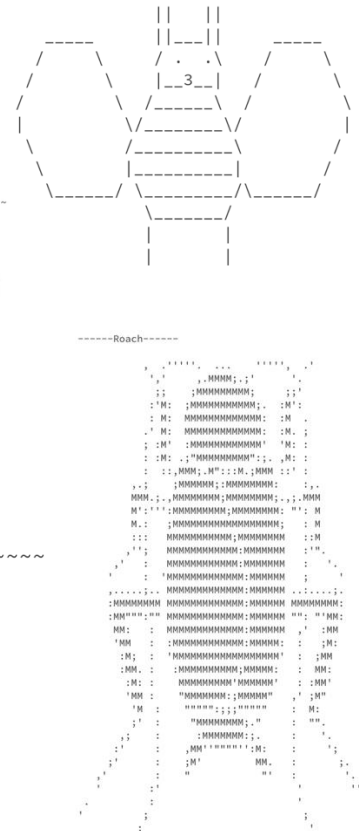
Some Bugs!

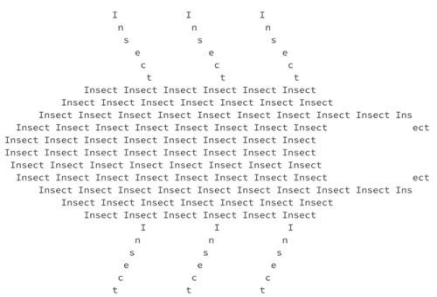




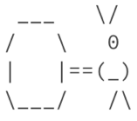


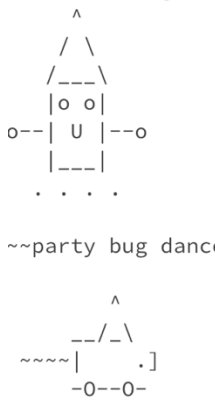


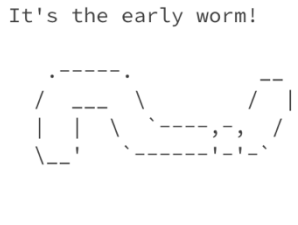


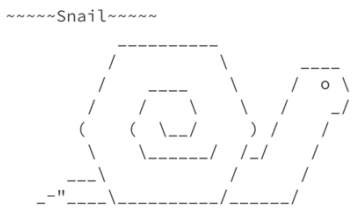


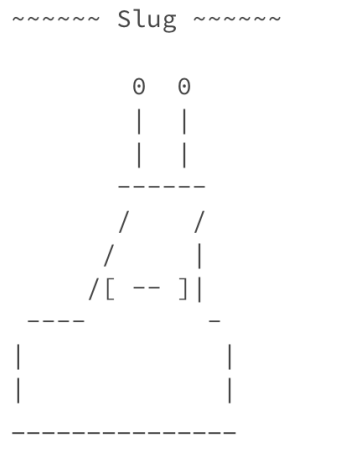
Dung beetle rolling his smelly luggage!







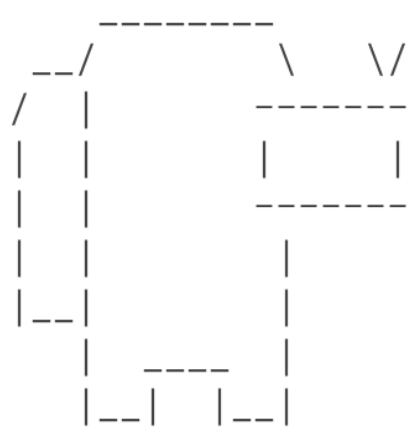




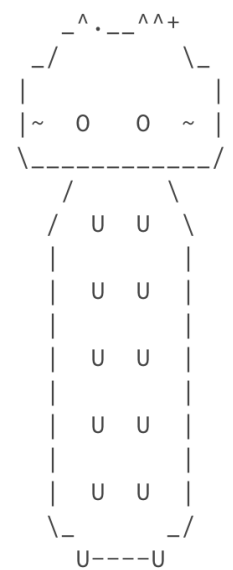
Some Bugs?

Bugs... Bunny!?

~~~~~~ Suspicious Bug ~~~~~~

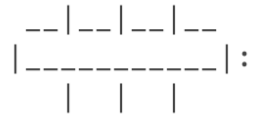


~~~~Caterpillar~~~~~~

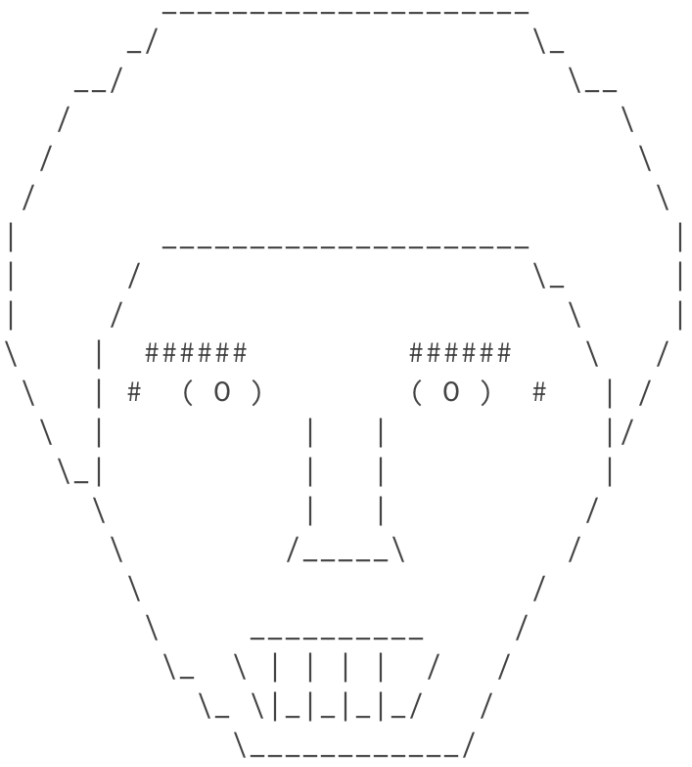


It's a CATerpillar! get it..

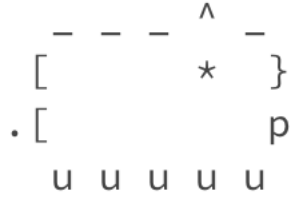
Behold: A Beetle!



Behold: A Beatle!



~~~~ Wiggly the Lamb ~~~~



Caption: Guy holding his hat!
~~~~

On Accessibility…

Great engagement with the C0 reflection! Some themes:

- It was inspiring and eye-opening to learn how blind programmers code
  - "This shifted my perspective from seeing accessibility as a special accommodation to recognizing it as a **smart design**"
- Little 'quality of life' changes can make a big difference!
  - It was "surprising how easy it was to make the debugger more accessible"
- Accessibility matters because…
  - "Good accessibility brings in more diverse developers with different perspectives and ideas, which can help with creating ***robust* programs**"

Is C0 Accessible?

Probably not…or at least **not *yet***.

When *looking* at ASCII art:

- Screenreaders *alone* aren't suited for reading ASCII art
- "The caption can help…somewhat"
- …but the caption could be low-quality or wrong!

Some ideas for improvement:

- Incorporating auditory elements
- Printing out the ASCII art and embossing it
- "Accessibility, in my mind, means that someone would be able to enjoy or create the same products using a different interaction"

So, What?

Broadly speaking: the **digital world is inaccessible**

- but that's changing!
- and **we** have the power to change it!

In CSE 121, we don't have the full knowledge yet to make accessible ASCII art (or Java programs, applications, video games, websites, …)

However, we encourage you to:

- think about accessibility when you make things with computers
- keep on learning more! UW is a **global leader** in digital accessibility
- e.g. at UW: CSE 493E: Accessibility, CREATE, AccessComputing

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- **Typecasting**
- More Variables and Operators!
- Strings and Characters Review
  - code example!

PCM: Casting

- Java will do some type conversions for us
  - E.g., `int` to `double`, `double` to `String`, `int` to `String`

- ***BUT*** some conversions Java won't do for us…
  - Nonsensical conversions (e.g., `"Gumball"` to `int`)
  - Conversions that are **"lossy"** (e.g., `double` to `int`)
    - We can ask Java to **typecast** for us

```
double x = 8.83;
int xInt = (int) x;
```

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PCM: Variables

- Recall: Variables allow us to give a name to a specific value
  - 3 parts: declaration, initialization, usage
  - Example:

```
String theBestBoy = "gumball";
System.out.println(theBestBoy);
```

- Declaration: `int x;`
- Initialization: `x = 30;`
- Or all in one line: `int x = 30;`

New: Manipulating Variables

They're made to be manipulated, modified, and re-used!

```
int myFavoriteNumber = 7;
int tripleFavNum = myFavoriteNumber * 3;
myFavoriteNumber = myFavoriteNumber + 3;
```

Note! This doesn't really make any mathematical sense. That's because in Java, = is *assignment*, not equality!

New Operator: +=

```
myFavoriteNumber = myFavoriteNumber + 3;
```

This pattern is so common, we have a shorthand for it!

```
myFavoriteNumber += 3;
```

This works for both numeric addition and string concatenation!

More Shorthand Operators

The shorthands `-=`, `*=`, `/=`, and `%=` exist too!

```
myFavoriteNumber /= 3;
```

Should this work for integers? Doubles? Strings?

Even Shorter Shorthands

There are even shorter operators for “incrementing” and “decrementing”!

```
myFavoriteNumber++; // myFavoriteNumber += 1;
myFavoriteNumber--; // myFavoriteNumber -= 1;
```

Should this work for integers? Doubles? Strings?

Practice: Think

sli.do #cse121

What values do a, b, and c hold after this code is executed?

```
int a = 10;
int b = 30;
int c = a + b;
c -= 10;
a = b + 5;
b /= 2;
```

A. 10, 30, 40

B. 35, 15, 30

C. 35, 15.5, 30

D. 20, 15, 30

Practice: Pair

sli.do #cse121

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- **Strings and Characters Review**
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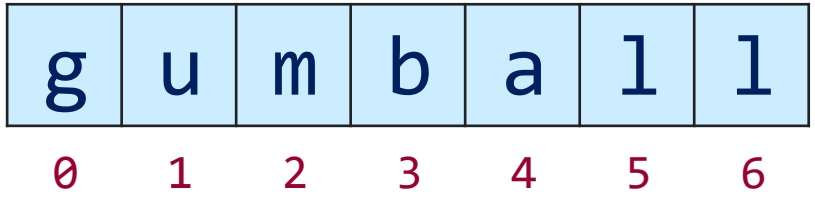
PCM: Strings & chars

- Recall: String literals are a sequence of characters that are *strung* together, begin and end with ""
  - Use zero-based indexing
- A `char` represents a single character
  - Begin and end with single quotes (')
  - Strings are made up of chars!




```
char letter = 'g';
char anotherLetter = 'b';
```

PCM: String Methods

Usage: `<string_variable>.<method>(…)`

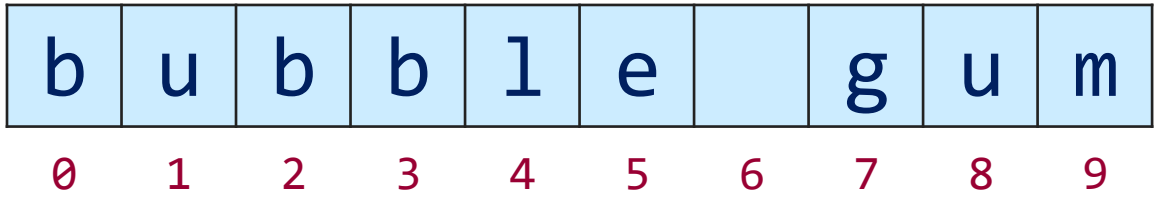
Method	Description
`length()`	Returns the length of the string.
`charAt(i)`	Returns the character at index *i* of the string
`indexOf(s)`	Returns the index of the first occurrence of *s* in the string; returns -1 if *s* doesn't appear in the string
`substring(i, j)` or `substring(i)`	Returns the characters in this string from *i* (inclusive) to *j* (exclusive); if *j* is omitted, goes until the end of the string
`contains(s)`	Returns whether or not the string contains *s*
`equals(s)`	Returns whether or not the string is equal to *s* (case-sensitive)
`equalsIgnoreCase(s)`	Returns whether or not the string is equal to *s* ignoring case
`toUpperCase()`	Returns an uppercase version of the string
`toLowerCase()`	Returns a lowercase version of the string

Practice: Think

sli.do #cse121

Suppose `s` contains the String `"bubble gum"`.

Which statement would result in `s` containing `"Gumball"` instead?



A. `s.substring(7) + "ball";`

B. `s = s.substring(7, 9) + "ball";`

C. `s = s.charAt(7).toUpperCase() + "ball";`

D. `s = s.substring(7, 8).toUpperCase() + s.substring(8) + "ball";`

Practice: Pair

sli.do #cse121

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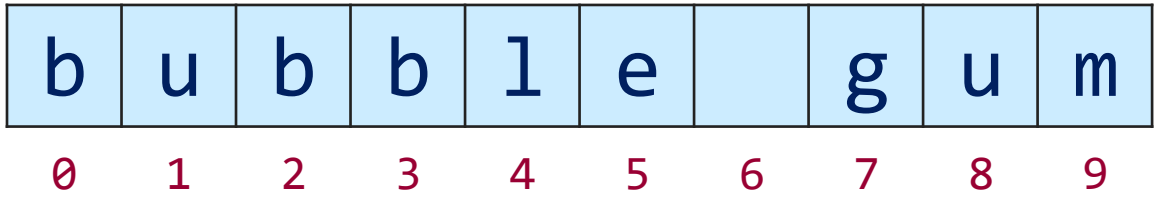

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Aside: Gumball