LEC 03

CSE 121

Characters, Strings, Variables, Debugging

Questions during Class?

Raise hand or send here

sli.do #cse121

BEFORE WE START

Talk to your neighbors:

What are your thoughts on the TikTok ban?

Music: 121 25wi lecture playlist

Instructor: Matt Wang

TAs:

Ailsa	Alice	Chloë	Christopher
Ethan	Hanna	Hannah	Hibbah
Janvi	Judy	Julia	Kelsey
Lucas	Luke	Maitreyi	Merav
Ruslana	Samrutha	Sam	Shayna
Sushma	Vivian		

Announcements, Reminders

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- Expect C0 grades ~ 1 week from submission (we'll announce on Ed)
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- More helpful website resources
  - Grading Rubrics
  - Ed Shortcuts
  - Search Site button

Beautiful Bugs: Countless Caterpillars (>70)

```
~~~~~ Caterpillar ~~~~~

  )  )
( o_o )(,)(,)(,)(,)(,)(,)
```

```
Look! A caterpillar!

  ooo   ooo   ooo
 (---) (---) (---)
  ~~~   ~~~   ~~~
```

```
And a very hungry
caterpillar!

          \/
(.)(.)(.)(:0)
/\/\/\/\/\/\
```

```
A caterpillar appears..

"oooooo
  """""
```

```
~~~~ Caterpillar ~~~~

\
'-.__.-'
/oo |--.--,--,--.
\_.-'._i__i__i_.'
    '''''''''''''
```

```
~~~~ Caterpillar ~~~~

_________/_
\_\_\_\_\_\
```

```
~~~ Caterpillar ~~~

 ) (
(O_O)0000000000000
     ^^^^^^^^^^^^^
```

```
~~ Caterpillar ~~

  _____________
 (_|__|__|__|_')
  ' '' '' '' '
```

```
Caterpillar
 \   /
( ^ ^ )
(  v  )
( ~~~ )
( ~~~ )
( ~~~ )
( ~~~ )
( ~~~ )
 -___-
```

```
Caterpillar
  \/
_|  |_
_|  |_
_|  |_
_|  |_
_|  |_
_|  |_
_|  |_
_|  |_
 |__|
```

```
Hello, I am a
caterpillar!

  (:  :)
  </ - \>
 </ -- \>
<|  --   |>
<|  --   |>
<\  --   \>
 <\   --  \>
  </   --  />
 </   --   />
 </   --  />
 </  -- />
 </ -- />
 <\ - \>
 </ - />
  </-/>
```

```
                  ll
[IIIIIIIIIIII*]
```

```
I think
it's...a
very hungry
caterpillar
!!

   | |
 -(.-.)-
 -(   )-
 -(   )-
 -(   )-
 -(   )-
 -(   )-
 -(   )-
 -(   )-
   -|-
```

```
caterpillar
 \ /
-[-]-
-[-]-
-[-]-
-[-]-
```

Technically Correct Bugs

```
Ah! A spider! Aren't they technically arachnids?

\\    //
 \\()//
 //()\\
//(::)\\
   ''


A centipede! (It actually has 100 legs)

||||||||||||||||||||||||||||||||||||||||||||||||||
0000000000000000000000000000000000000000000000000(:)<
||||||||||||||||||||||||||||||||||||||||||||||||||
```

Characteristic Creatures

```
  ~~~~~ Binary Bug ~~~~~


       1     1
0       1   1       0
1       10011       1
1     001010110     1
 1  1001101000010  1
  00110100101011010
   010110101011011
    0101101000110
    0011011011110
   101011101010001
  01010111010100010
 1  0101101110001  1
1     011011010     1
1       01100       1
```

```
here comes the bug reincarnation of
Al Capone, the famous American
gangster from the 1920s and 30s


   ___           sm
  / HAT \      smoke
 ---------    SMOKE
 | 0   0 |   sm
 \  --cigar
  |shTrt|
/-|shIrt|-\
  |shErt|
/-|shirt|-\
  \_____/
```

```
~~~~~ Alphabug ~~~~~


        /\   /\   /\
       \-\--\-\--\-\  /
 ABCDEFGHIJKLMNOPQRSTUVQXYZ
       /-/--/-/--/-/  \
        \/   \/   \/
```

```
----- String Bug -----

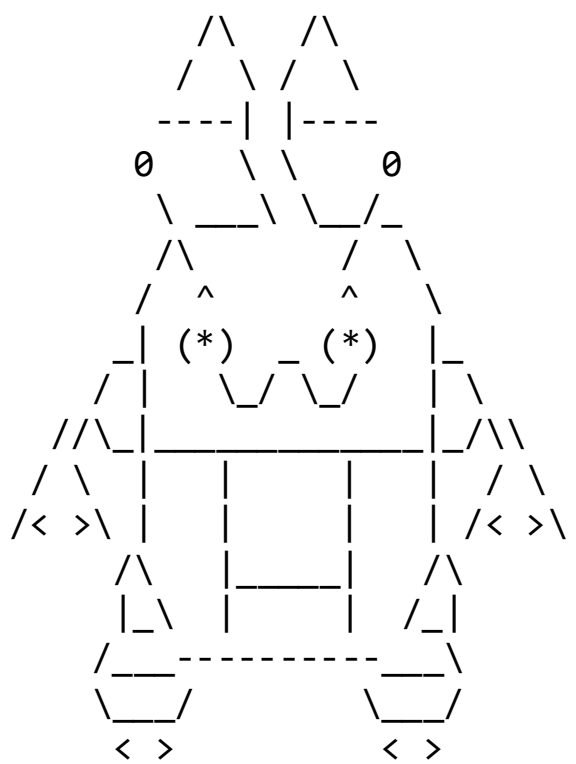
g  g  g  g  g
u  u  u  u  u
bugbugbugbugbug /
bugbugbugbugbug
bugbugbugbugbug \
u  u  u  u  u
g  g  g  g  g
```

```
~~~~~ Ant ~~~~~

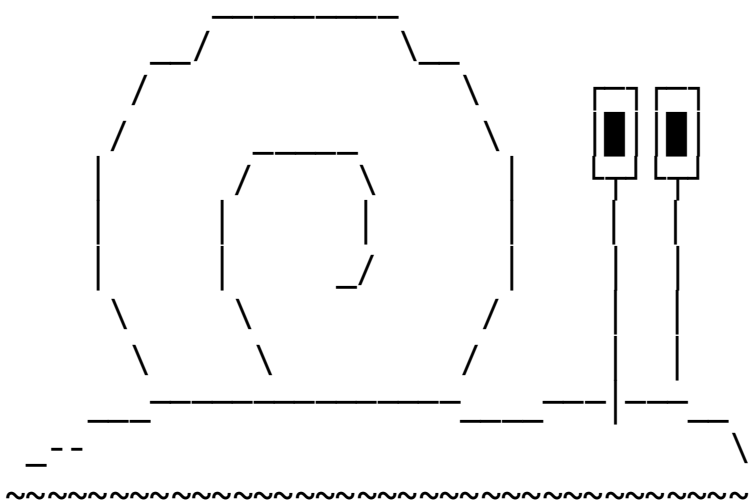

      __       __
        \     /
         \   /
          ant
        antanta
       antantant
        antanta
          ant
    ^     ant     ^
   / \   antantant   / \
  /   \ antantantant /   \
 __/   \antantantantan/   \__
        antantantant
     ^   antantant
    / \      ant        ^
   /   \  antantant    / \
  __/   \antantantant /   \
        antantantantan/   \__
         antantantant
       ____antantant
      /       ant____
     __/             \
                      \__
```

BIG Bugs

~~~~ Heracross (Pokémon)~~~~



-----Gary the snail-----


~~~~

Storied Snails

```
This is Toro the football snail bug

   ____
  /    \  |  |
 /  ||  \ - -
 \  ||  /
  \____/

Toro is from Houston Texas


This is Toro's friend, Charger the lightning bug

 _/\_
 \  /__..
 /__\

Earlier today, Toro and Charger played football and Toro
won 32-12, when all the other bugs were saying Toro couldn't win.
```

And, some funny ones…

```
~~~~~ YASS Bug ~~~~~

  \ /
\('_')
   ))Z
  /\
```

```
----- Bug Wang -----

    \  /
 --|'王'|--
 --| 王 |--
 --| 王 |--
    ----
```

```
THE MAN EATING WORMMM

  (⌒⌒⌒⌒⌒⌒⌒)"-
  ( *   * )  "-
  |_______|"-      "IM A WORM AND IM GONNA SLURP UR MAN UP RAHHHH"
  |_______|"-
  |_______|"-
  |_______|"-
  |_______|"-
   |_______|"-
    |_______|"-
       |_______|"-
          |_______|"-
            |_______|"-
           (_______)"-
```

```
      ^
     / \
   <{   }>
     \ /
      O
A bug that looks deceivingly fish-like but is most definitely
a bug and not a fish because if it was a fish it wouldn't
follow the assignment guidelines.
```

```
He's being followed!
By an...inchworm?

0o°°ooo
 """""""


...thats a weird inchworm.
Let's leave. These bugs are weird. Bye!
```

On accessibility…

Loved your reflection responses! Some themes:

- not knowing how blind people use computers (or program)
- being inspired by the speaker's perseverance and determination
- accessibility really matters, because:
  - "it would be a shame to lose a great programmer because they don't have the tools to do what they're truly capable of"
  - "it is difficult for unimpaired programmers to even think of ways in which they can help disabled programmers without direct collaboration"
  - "when we make things more accessible, it often makes them better for everyone, not just people with disabilities.

Is C0 accessible?

Broad spectrum of answers, but **most of you said no.**

When *looking* at ASCII art:

- screenreaders *alone* aren't suited for reading ASCII art
- the caption is probably not enough context for a blind user
- the caption could be low-quality or wrong!

Doing the assignment would be even harder!

- have to learn coding *alongside* new interaction techniques
- Ed doesn't have the same accessibility features

So, what?

Broadly speaking: the digital world is inaccessible (but that's changing)!

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

New: Manipulating Variables

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

```
int myFavoriteNumber = 7;
int doubleFV = myFavoriteNumber * 2;
myFavoriteNumber = myFavoriteNumber + 3;
```

Notice – 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

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What 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

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

```
int a = 10;
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A. 10, 30, 40

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String Methods

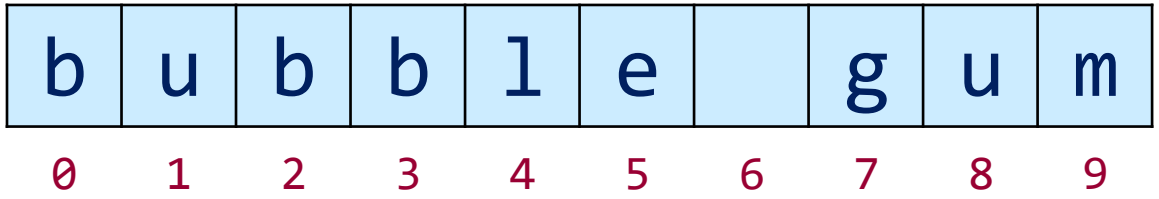
Method	Description
`length()`	Returns the length of the string.
`charAt(i)`	Returns the character at index *i* of the string
`indexOf(s)`	Returns the index of the first occurrence of *s* in the string; returns -1 if *s* doesn't appear in the string
`substring(i, j)` or `substring(i)`	Returns the characters 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: Think

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

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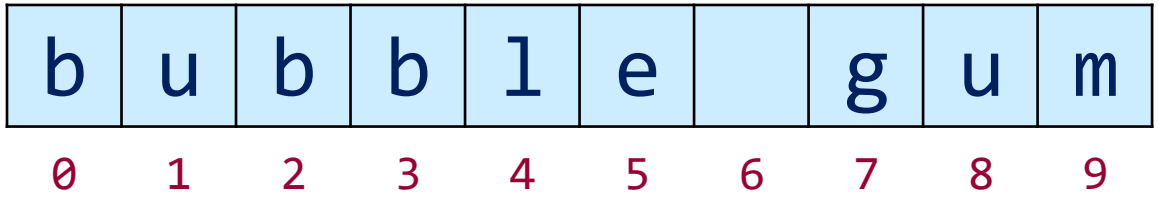

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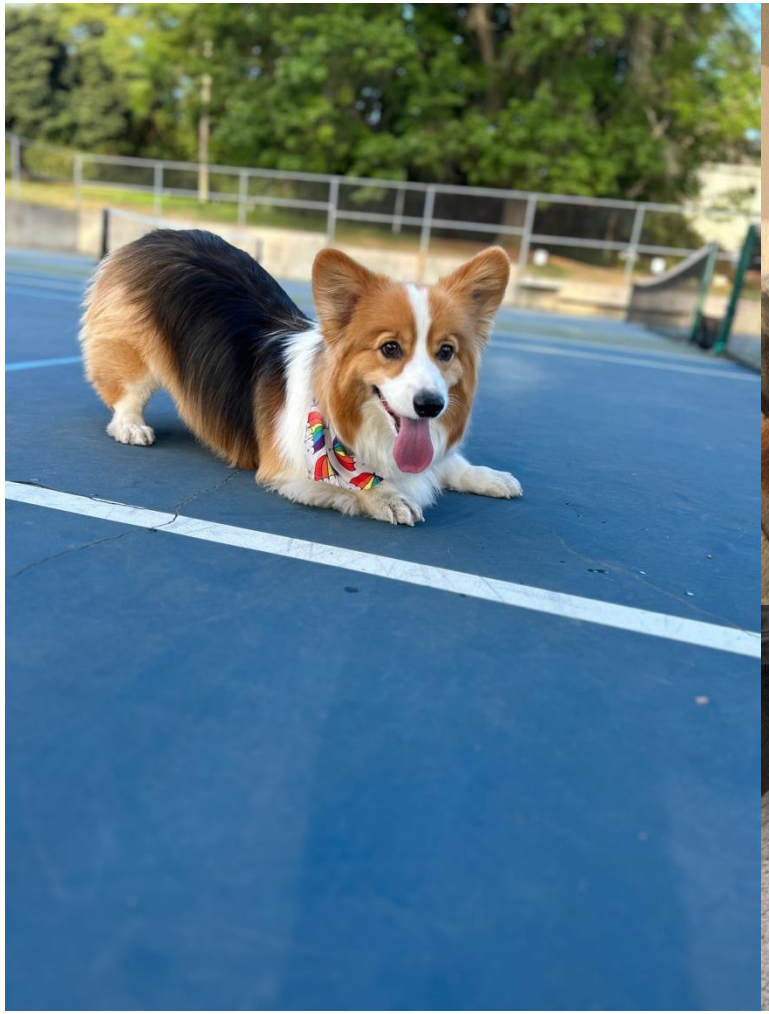
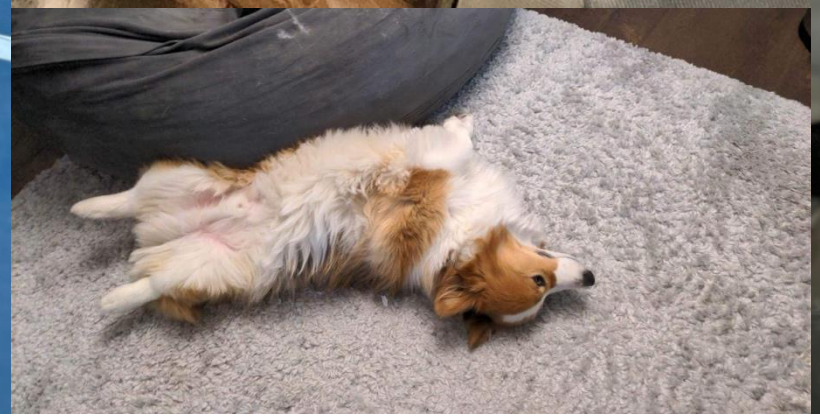
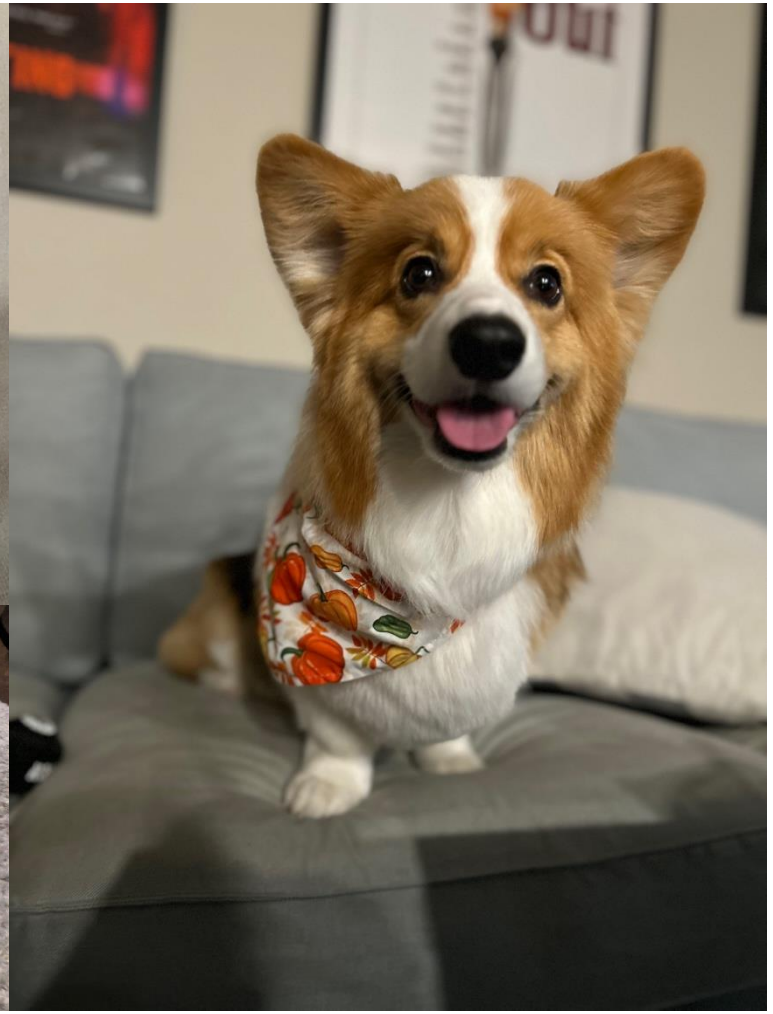
Aside: Gumball







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