CS 0007 RECITATION – 9/16/21

LIN ROJTAS – 10:00A – 10:50A

AGENDA

- Variables and arithmetic, pt 2
  - Integer division
  - Casting
  - The final keyword
- Strings!
  - Review of primitives and objects
- Lab 3 hints

INTEGER DIVISION

- Integer division and floating point (decimal) division are different!
- If you're dividing two integers, you will end up with a whole number (`int`). Otherwise, you'll end up with a decimal (`double`)

```
public static void main(String[] args) {
    System.out.println(10/3);
    System.out.println(10.0/3);
    System.out.println(10/3.0);
    System.out.println(10.0/3.0);
}
```

INTEGER DIVISION

```
public static void main(String[] args) {
    System.out.println(10/3);
    System.out.println(10.0/3);
    System.out.println(10/3.0);
    System.out.println(10.0/3.0);
}
```

```
3
3.3333333333333335
3.3333333333333335
3.3333333333333335
```

CASTING

- When working with primitives, you can change certain data types into other data types!
- Widening casting (small to large)
  - byte → short → char → int → long → float → double
- Narrowing casting (large to small)
  - double → float → long → int → char → short → byte

CASTING

- Widening casting is done automatically…

```
char ex = 'a';
int num = ex;
System.out.println(num);
```

- While narrowing casting has to be done manually…

```
int num = 97;
char ex = (char)num;
System.out.println(ex);
```

- In general, though, it's good practice to do all casting manually

```
char ex = 'a';
int num = (int)ex;
System.out.println(num);
```

THE FINAL KEYWORD

- The `final` keyword is used when you're declaring a constant
  - (a variable that cannot be changed or reassigned!)
- Convention: variable names with the `final` keyword are given names in all caps

```
final double GRAVITY = 9.6;
```

WHAT HAPPENS IF WE TRY TO CHANGE A FINAL VARIABLE?

- Well…

```
final double GRAVITY = 9.6;
GRAVITY = 10.0;
```

```
Main.java:4: error: cannot assign a value to final variable GRAVITY
    GRAVITY = 10.0;
    ^
1 error
```

STRINGS

- Recall: Strings are objects, meaning they come with their own special operations
  - Instead of calling Strings "variables", we typically say "objects" or "instances of"
    - Variable `num` versus object `name`
- Say we have a String object named `str`. Common operations are:
  - `str.toUpperCase();` → returns `str` in all uppercase letters
  - `str.toLowerCase();` → returns `str` in all lowercase letters
  - `str.charAt(int num);` → returns a `char` at index `num` in `str`
  - `str.length();` → returns an `int` giving the length of `str`

STRING METHODS

```
String str = "Coding is FUN!";
String upper = str.toUpperCase();
String lower = str.toLowerCase();
char secondLetter = str.charAt(1);
int strLength = str.length();
```

```
Coding is FUN!
CODING IS FUN!
coding is fun!
o
14
```

- Note: string indexing starts at 0!
  - `str.charAt(0);` would return 'C' while `str.charAt(14);` gives an error

LAB 3 HINTS

- Activity 1: Temperature Conversion
  - Tip: USE THE FORMULA GIVEN TO YOU!! Think about how you would do this problem on paper, and then do your best to translate that into code.
- Activity 2: Variable Types
  - Tip: You don't need to print anything; we're just looking to see that you're using the appropriate variable type and naming conventions!

LAB 3 HINTS

- Activity 3: Game Playtime
  - Tip: make sure you're using integer division and the modulus (%) operation! This is another instance in which it would be helpful to do this on paper first and then do your best to convert it into code
- Activity 4: Degrees to Radians
  - Tip: reference the Java Math API! Don't be intimidated by the long equation; the computer does all of the heavy lifting for you. Just think about which methods in the Math class help with exponents and keep the order of operations in mind. Parentheses are your friend, too!

OTHER GENERAL LAB TIPS

- Coding is hard! It's okay if you don't get it on the first go around.
- Make sure to check for common syntax errors (meaning, sometimes you'll forget to add a semicolon at the end of a line; it happens!)
- Before you come to me asking for help, make sure you try working on your own first! There's only so much that I can help you with and you already having some code we can work with helps a great deal.
- Again, don't cheat. Cheating is for losers.

FOR NEXT WEEK

- Lab 3 is out!
  - I gave some tips in my slides, use them! It's your first actual coding assignment, so I expect you guys to have a little trouble. That's what my office hours are for, though. Don't be shy!
  - I will answer questions to the best of my ability.
  - The way you all submit assignments may change; keep an eye on Canvas for new submission instructions.
- Next week: Coding style, inputting data, and maybe if-structures!
- Wear a mask, wash your hands, get vaccinated, and be safe!