CMSC 131

Fall 2018

Announcements

- Many new students...
  - Class webpage
  - Copy someone's notes

- First project (Hello World) is now due Wednesday 9/12

Free Tutoring (from MCWIC)

Open to EVERYONE

- 1 on 1 tutoring by appointment:

http://go.umd.edu/TutorRequest

- Guided Study Sessions (CMSC 131)

  Room 3136 A.V. Williams building

  Mondays 2:00 – 3:00

  Tuesdays 1:00 – 2:00

Recall: Primitive Types (Whole Numbers First)

- An `int` variable takes up 4 bytes of memory. What range of values can be stored?

Type	Memory used	Range of values that can be stored
long	8 bytes	-9,223,372,036,854,775,808 to 9,223,372,036,854,775,807
int	4 bytes	-2,147,483,648 to 2,147,483,647
short	2 bytes	-32,768 to 32,767
byte	1 byte	-128 to 127

- Examples:

```
int secondsPerYear = 31557600;
long humansOnEarth = 7625913792L;   // note the L
byte age = 19;
```

Primitive Types (Floating Point Values)

Type	Memory used	Range and precision (for positive values)
double	8 bytes	$1.7976931348623157 \times 10^{308}$, $4.9406564584124654 \times 10^{-324}$
float	4 bytes	$3.40282347 \times 10^{38}$, $1.40239846 \times 10^{-45}$

```
double velocity = 325.92732;

float distance = 52.25F;      // note the F
```

Strings

- What's a String?

```
Example:
    String name = "Fred";    // note the double quotes
```

IMPORTANT: Strings are not primitives – they are objects! (More about that later.)

Examples: Strings1, Strings2, Strings3

Things to observe:

- Use double quotes around String literals

- Concatenation with +

- x.length() yields the length of the String x

- Java will sometimes implicitly convert things to Strings (e.g. when using the + operator)

Examples: Scanner1.java, Scanner2.java

The Scanner can be used to obtain input from the user.

- At the top of the file: `import java.util.Scanner;`

- Declare a Scanner variable:

    `Scanner myScanner = new Scanner(System.in);`

- To use the scanner:

    ```
    int x = myScanner.nextInt();
    double y  = myScanner.nextDouble();
    long z = myScanner.nextLong();
    String a = myScanner.nextLine();
    String b = myScanner.next();
    ```

- When finished: `myScanner.close();`

Example: ScannerPitfall.java

Unexpected result from the following sequence:

int size = myScanner.nextInt();

String name = myScanner.nextLine();

Continue: How are basic kinds of data stored?

- We talked about whole numbers

- We talked about floating point numbers

- How is "text" stored in RAM?

More Primitive Types (Characters)

- char

Example:

```
char letterGrade = 'A';    // Note the single quotes
```