**Review**

- Lab 5 is now available.
- Remember to take the quiz for assignment 06 after you do Lab 5!

- String declarations and creations
  - String s = "abc";
  - String s = new String("abc");
- length(), indexOf()
- equals()

**2D array exercise**

- Find the average of each column of the 2D array int [][] ages; Store the averages in a oneD array float[] ageAverages. The length of ageAverages should be the number of columns in ages.

**More String functions**

- indexOf used with a substring
  - String str = "abcdefgahi";
  - println(str.indexOf("def"));
  - println(str.indexOf("bb"));
- substring(beginIndex, endIndex)
  - beginIndex is inclusive, endIndex is exclusive
  - String str1 = str.substring(3);
  - String str2 = str.substring(3, 6);

**Exercise**

- String msg = "The quick brown fox jumps over the lazy dog."
- Write code to create substring "fox jumps"
- Write code to create substring "lazy dog"

**2-parameter indexOf**

- String s = "a man, a plan, a canal Panama";
- int i = s.indexOf("an"));
- int i = s.indexOf("an", 4));
- println(s.indexOf("an", i+1));

**toString**

- toString() is a method defined to return a String, which is meant to be the string representation of an object
- It is what println and print will use when called on an object
- Every object/class inherits from a superclass Object which comes with a toString() method
- Overwrite the toString to how you want your object printed.
Array of String

• Declarations
  - String[] strs = new String[10];
  - String[] strs = {"ab", "cde", "f"};
• Write a function that takes an array of strings strs and another string s and return how many of the strings in the array contain the string s as a substring.

split() and splitTokens()

• String s = "a man, a plan, a canal Panama";
• String[] strs = splitTokens(s, ",");
• String[] strs = s.split (",");
• What will be the length of strs?
• What will be the value of strs[1]?
• Write the expression that gives the number of elements in strs.

WHO Tuberculosis data


// parseFile1
String[] data;
void setup() {
  // Load data from a file as array of strings
data = loadStrings("reduced.csv");
  for (int i=0; i<data.length; i++) {
    println(data[i]);
  }
}
```java
// parseFile()
String[] data;
Item[] items;
int count = 0;
void setup() {
  data = loadStrings("reduced.csv");
  items = new Item[data.length-1];
  for (int i = 1; i < data.length; i++) {
    String[] pieces = data[i].split (",");
    items[i-1] = new Item(pieces[0],
      Integer.parseInt(pieces[1]),
      Integer.parseInt(pieces[2]),
      Integer.parseInt(pieces[3]));
  }
  for (int i = 0; i < items.length; i++) {
    println(items[i]);
  }
}

class Item {
  String country;  // Country name
  int year;        // Year
  int pop;         // Population
  int inc;         // Incidences of TB per 100,000
  Item(String country,
    int year,
    int pop,
    int inc) {
    this.country = country;
    this.year = year;
    this.pop = pop;
    this.inc = inc;
  }
  String toString() {
    String msg = "In " + year + ", " + country + 
      " had population " + pop + 
      " and TB incidences per 100k of " + inc; 
    return(msg);
  }
}
```

GapMinder
http://www.gapminder.org

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Corruption and Human Development

The use of public office for private gain benefits a powerful few while imposing costs on large swaths of society. Transparency International’s annual Corruption Perceptions Index, published on December 1st, measures the perceived levels of public-sector graft by aggregating independent estimates from across the globe. Just five non-OECD countries make the top 25: Singapore, Hong Kong, Barbados, Bahamas and Qatar. The bottom is formed mainly of failed states, poor African countries and nations that either were once communist (Turkmenistan) or are still run along similar lines (Venezuela, Cuba). Comparing the corruption index with the UN’s Human Development Index (a measure combining health, wealth and education), demonstrates an interesting connection. When the corruption index is between approximately 2.0 and 4.0 there appears to be little relationship with the human development index, but as it rises beyond 4.0 a stronger connection can be seen. Outliers include small but well-run poorer countries such as Bhutan and Cape Verde, while Greece and Italy stand out among the richer countries.

Every death on every road

Who owes how much to whom?