ECOL 553L

2-D Arrays and Extra Credit!!

Housekeeping

- How was the mid-term?
- How are your projects coming?
  - Feel free to ask Sergei or I questions about your topics and how to go about implementing them
- How many people have started the homework due Tuesday?

Big Arrays (multiple dimensions)

- Sometimes, we need more than one dimension in a table of data
  - i.e. if each row in a TSV is an array, then the whole file is a 2-D Array or an **Array of Arrays**
- Referencing a 2-D array is straight forward
  - `$2Darr[$i][$j]` **# the `$i`-th row, `$j`-th column**
- Setting up an array of this sort is a little harder
  - Static

```
my @2Darr = (['A','B','C'] , ['D','E','F']);
```

  - Push

```
my @arr1 = ('A','B','C');
my @arr2 = ('D','E','F');
push @2Darr, [@arr1];
push @2Darr, [@arr2];
```

Big Arrays (multiple dimensions)

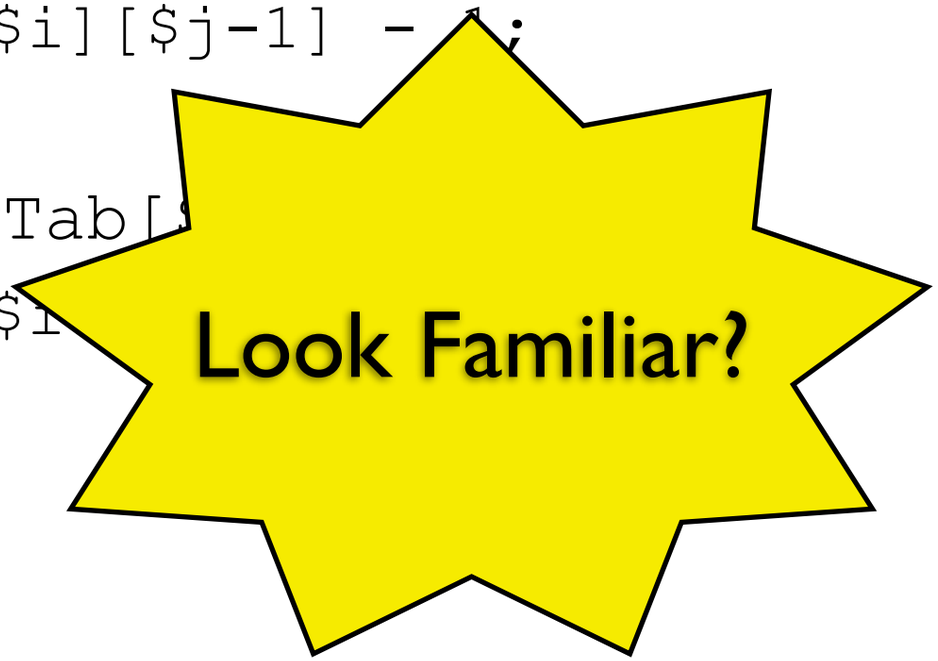
- Why would you use the second method?
- Example: TSVs

```
my @TSV;
open FILE, “file.tsv” or die(“file.tsv”);
while(my $line = <FILE>){
 my @lineArr = split(/\t/,$line);
 push @TSV, [@lineArr];
}
```

Big Arrays (multiple dimensions)

- Calculations on 2-D arrays are just like those in a 1-D array

```
$DPTab[$i][$j] = $DPTab[$i-1][$j-1] -1;
if(#char A_i equal B_j){
        $DPTab[$i][$j] ++;
}
if($DPTab[$i][$j-1] - 1 > $DPTab[$i][$j]){
        $DPTab[$i][$j] = $DPTab[$i][$j-1] - 1;
}
if($DPTab[$i-1][$j] - 1 > $DPTab[$
        $DPTab[$i][$j] = $DPTab[$i
}
```



Extra Credit

- Copy `~deblasio/ecol553_student/needleman.pl` into your own folder
- Make a copy of it called `smith.pl`
- Edit `smith.pl` it so it computes the highest scoring ***local alignment*** rather than the best *global alignment*
  - i.e. convert Needleman-Wusch to Smith-Waterman

- 3 points added to your quiz score
- you can work in groups, turn in one copy with your netIDs as comments at the top
- turnin ExtraCredit1 by the **end of class**
  - if you turn it in early I will test it for you and let you know if you got it right
  - up to 3 chances (your second try is only 2 points, third is 1)

Differences between NW and SM

- If best value is less than 0, then the value is 0 and there is no direction
  - (make the direction value “ “, one space)
- find the max value in the table
- trace from max value to its 0 (could be the origin?)