CS 161
Intro to CS I

Static vs. Dynamic Arrays
Odds and Ends...

- Exercise #6 due tonight
- Assignment #4 due Monday night
What is an Array?

- **Array (ar·ray) n.** An ordered arrangement of related items.
  - Example: Array of colors in a rainbow.
    - Related items?
    - Ordered arrangement?
  - Class examples?
  - Computer Science
    - Same data type/data structure
    - Contiguous memory locations
Create 1-D Array

```c
int student_grades[5];
```

- How do you access each item?
- What does the array name represent?
- Why is the array name the address of 1st element?
- What are the initial values?
Initialize/Assign Values

- **Declaration**
  ```c
  int student_grades[5] = {0, 0, 0, 0, 0};
  ```

- **Individual Elements**
  ```c
  student_grades[0]=0;
  ...
  student_grades[4]=0;
  ```

- **Why is this incorrect?**
  ```c
  student_grades={0, 0, 0, 0, 0};
  ```
Initialize/Assign Values...

• Using a Loop
  While Loop Example:
  
i=0;
  while (i<5) {
    student_grades[i]=0;
    i++;  
  }

  For Loop Example:
  for(i=0; i<5; i++)
    student_grades[i]=0;

• Which is better to use with arrays and why?
Read/Print 1-D Array Values

• Read Values From User
  
  ```cpp
  for(i=0; i<5; i++) {
    cout << "Enter final grade for student: ";
    cin >> student_grades[i];
  }
  ```

• Print Values
  
  ```cpp
  for (i=0; i<5; i++) {
    cout << "Student\'s final grade is " << student_grades[i] << endl;
  }
  ```
Static vs. Dynamic 1-D arrays...
How does freeing memory work?

```cpp
int *p, *q;
p=new int;
q=new int[5];
delete p;
delete [] q;
```