# CS 161
# Intro to CS I

Finish 1-D arrays/C-style string

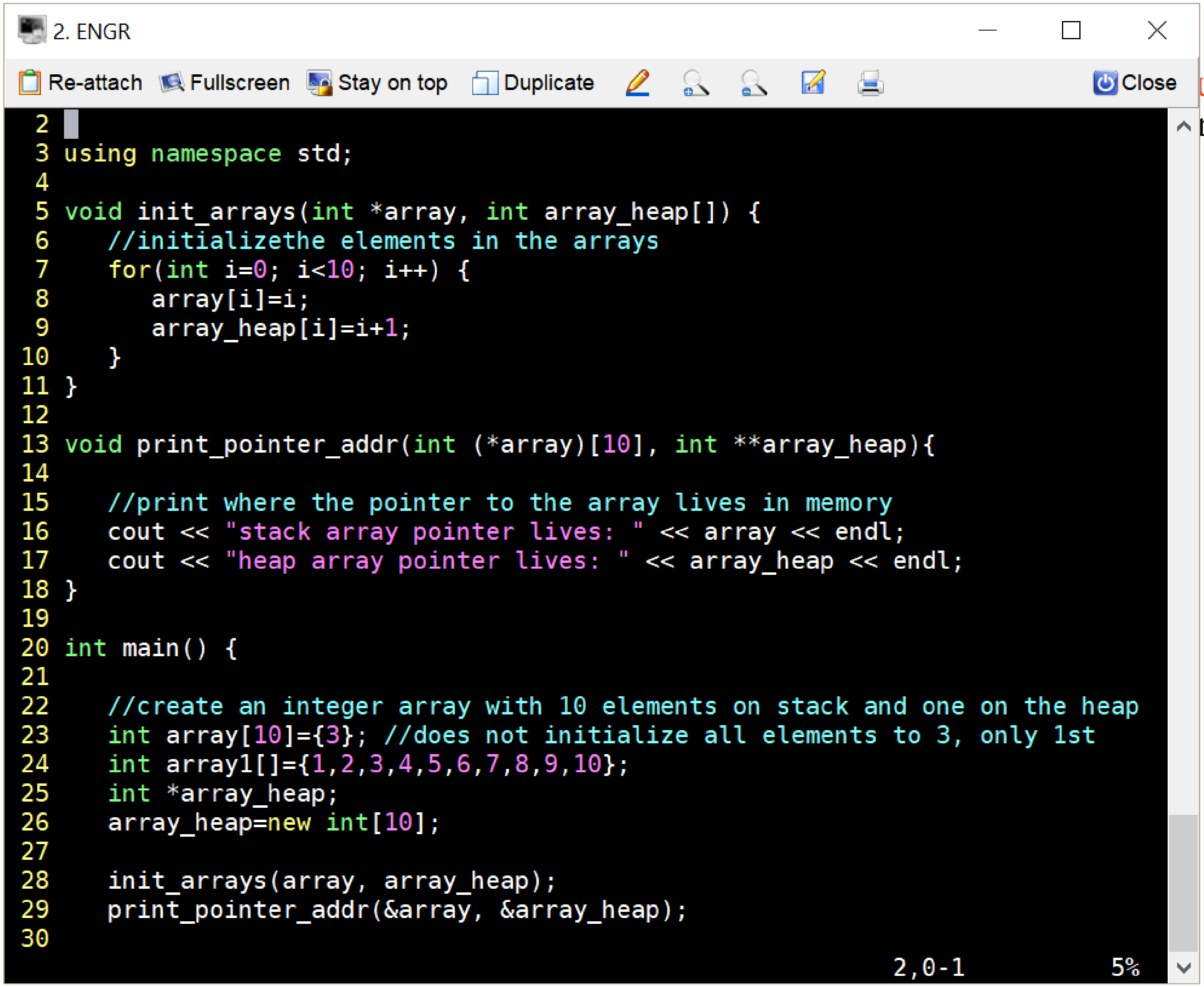
# Odds and Ends

- Last week to demo Assignment 4
- I’ll be out of town Wed./Fri.
- Exam II next Wed.

# Class Exercise

- How do I initialize an array in a function?
- How can I print the contents of the array in a function?
- How about printing the address of the pointer to the array and the address of where the array begins in a function?

- How would I create an array in a function?



```

using namespace std;

void init_arrays(int *array, int array_heap[]) {
   //initializethe elements in the arrays
   for(int i=0; i<10; i++) {
      array[i]=i;
      array_heap[i]=i+1;
   }
}

void print_pointer_addr(int (*array)[10], int **array_heap){

   //print where the pointer to the array lives in memory
   cout << "stack array pointer lives: " << array << endl;
   cout << "heap array pointer lives: " << array_heap << endl;
}

int main() {

   //create an integer array with 10 elements on stack and one on the heap
   int array[10]={3}; //does not initialize all elements to 3, only 1st
   int array1[]={1,2,3,4,5,6,7,8,9,10};
   int *array_heap;
   array_heap=new int[10];

   init_arrays(array, array_heap);
   print_pointer_addr(&array, &array_heap);

```

# Finish Implementing…

# Picture…

# What are C-style strings?

- Ended by ‘\0’ character
- Need to include <cstring>

# C-Style Strings Demo…

# Multidimensional Arrays

- data_type array_name[rows][cols];
  - int array[2][3];
  - int array[4][2][3];
  - int array[2][4][2][3];
- What are examples of these?
  - 2-D – Matrices, Spreadsheet, Minesweeper, Battleship, etc.
  - 3-D – Multiple Spreadsheets, (x, y, z) system
  - 4-D – (x, y, z, time) system

# Initializing 2-D Arrays

- **Declaration:** int array[2][3] = {{0,0,0},{0,0,0}};
- **Individual elements:** array[0][0]=0; array[0][1]=0; array[0][2]=0; array[1][0]=0; array[1][1]=0; array[1][2]=0;
- **Loop:**

```
for(i = 0; i < 2; i++)
   for(j = 0; j < 3; j++)
      array[i][j]=0;
```

- Why do we need multiple brackets?

# Reading/Printing 2-D Arrays

Oregon State University
College of Engineering

- Reading Array Values

```
for(i = 0; i < 2; i++)
   for(j = 0; j < 3; j++) {
      cout << “Enter a value for ” << i << “, ” << j << “: ”;
       cin >> array[i][j];
     }
```

- Printing Array Values

```
for(i = 0; i < 2; i++)
   for(j = 0; j < 3; j++)
        cout << “Array: ” << array[i][j] << endl;
```