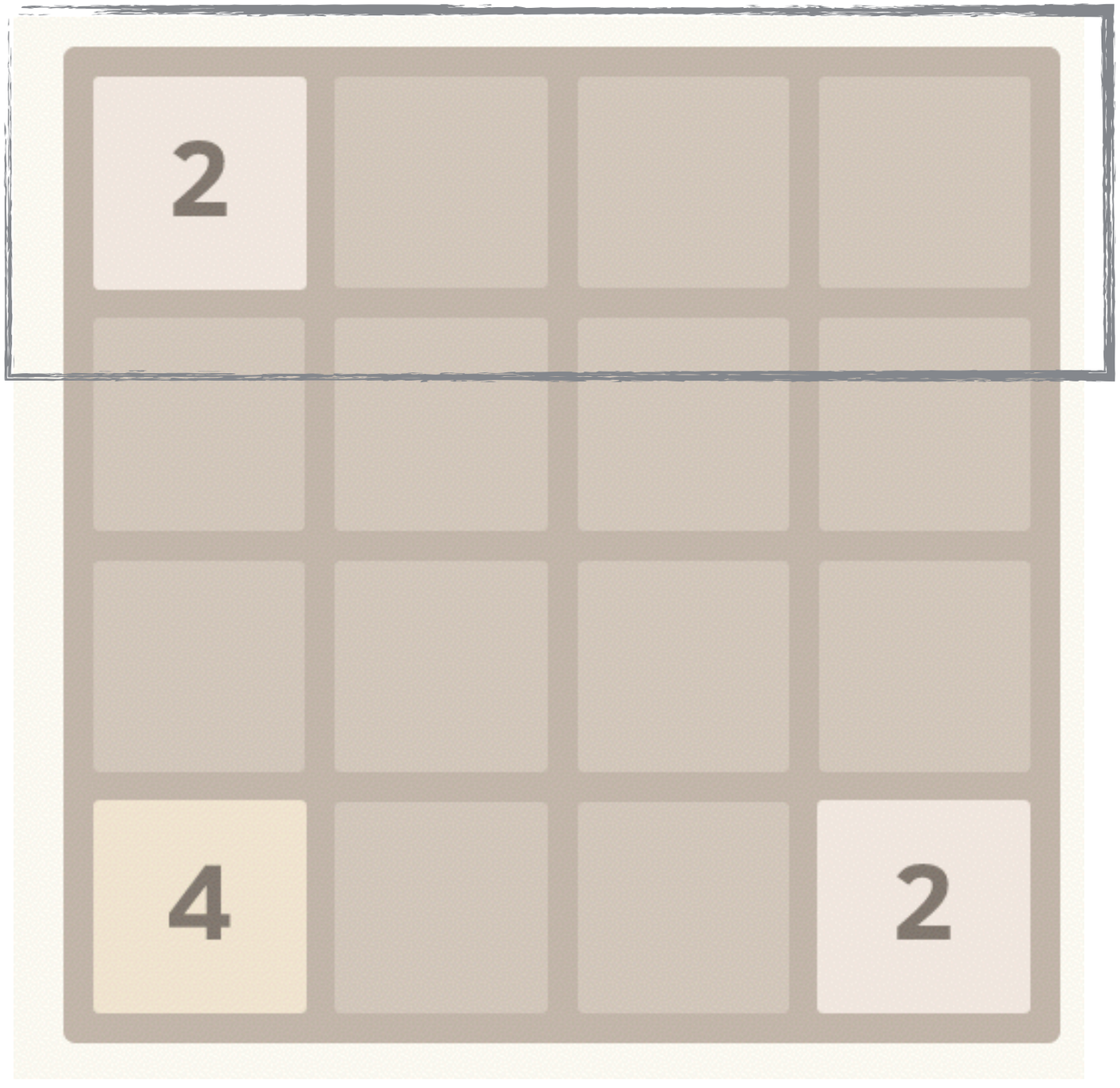
Arrays/Pointers

Variables review


2
4
2

```
int a[4];
char * b[] = {“roll”, “tide”};
double c[2] = {4.0, 9.7};
```

Accessing Parts of an Array

Use indexing!

a[0]

To change value at index:

a[3] = 7;

Remember: counting starts at zero!

Be careful!

Accessing beyond the bounds of an array will not give you an error!

arrays.c

Aliases

```
double a[] = {1.4, 3.9};

double *b = a;

b[0] = 2.2;
```

To create alias, add a *!

```
double **b;
b[0] = a;
```

- lvalues: things on the left side of an assignment statement, we update their values

- lvalues refer to memory locations

- rvalues: things on the right side of an assignment statement, we use their values

Size of arrays

sizeof(a) : returns number of bytes allocated

sizeof(a) / sizeof(double)

sizeof(a) / sizeof(*a)

Does not work for pointers!

More Indexing

- Can also index with pointers

- Dereferencing: *a = 0; same as a[0] = 0;

Static vs. Dynamic

- Previous arrays were statically allocated

- Dynamically allocated arrays last for length of your program

Strings

```
//test
char *s1 = "hello";
char s2[6] = { 'h', 'e', 'l', 'l', 'o', '\0' };
printf("%s\n",s1);
printf("%s\n",s2);
```

string array must end with null character

Changing a String

```
char *r = "rat";                        //r points to a literal string
char s[] = { 'r', 'a', 't', '\0'};      //s pseudopoints to an array of char
char *t = r;                            //t points to a literal string
char *u = s;                            //u points to an array of char
```

```
r[0] = 'c';     //BAD
s[0] = 'c';     //OK
t[0] = 'c';     //BAD
u[0] = 'c';     //OK
```

Length of a String

strlen(s1)

strlen(s2)

Copying a String

```
char *a = “roll tide”;

char b[10]; // don’t forget null character!

strncpy(a, b, 10);
```

Comparing Strings

strcmp(a, b);

Returns 0 if same, negative int if first string comes first, positive int if second string comes first

2048strings.c