

CSCI 1370

MARCH 27, 2017

ADMINISTRATIVA

Exam #2 will be returned Wednesday.

*After this [last] week, **Group Meetings** will be personal responsibility...*

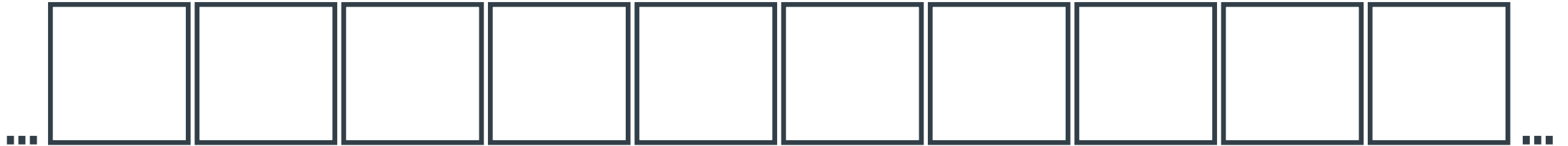
STRINGS REVISITED

```
string s = "hello";
```

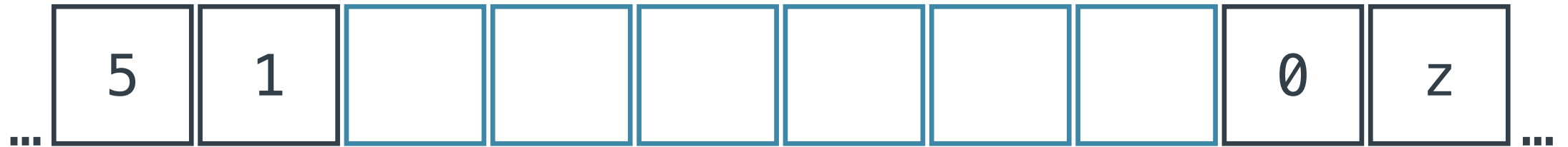
Recall, strings are just an ordered set of characters...


```
string s = "hello";
```

```
string s = "hello";
```



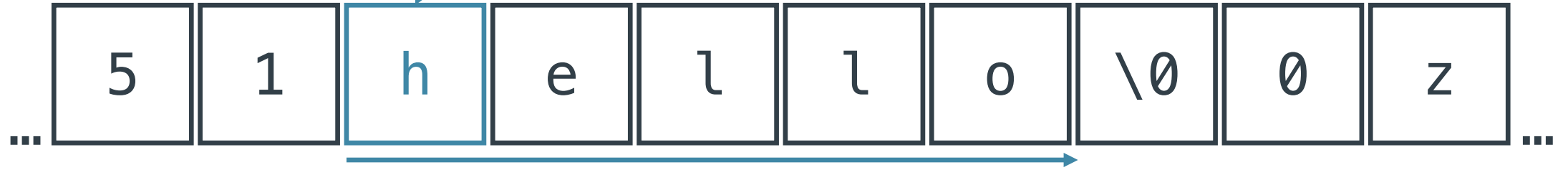
```
string s = "hello";
```





(string)

```
cout << s;
```



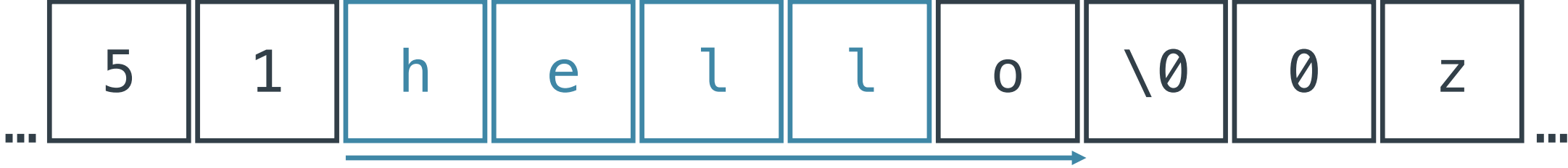
```
cout << s;
```



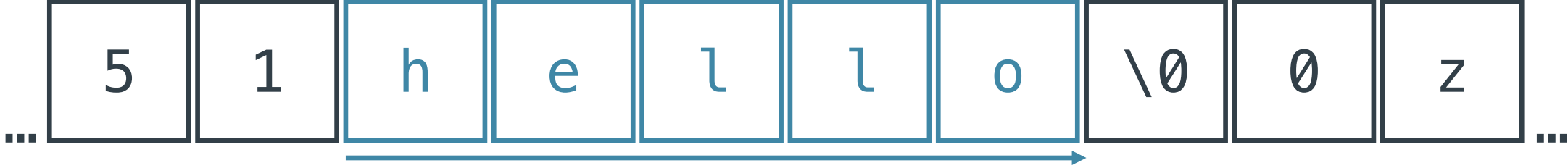
```
cout << s;
```



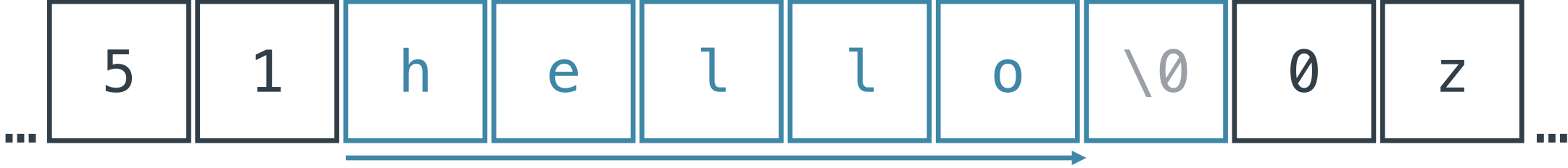
```
cout << s;
```



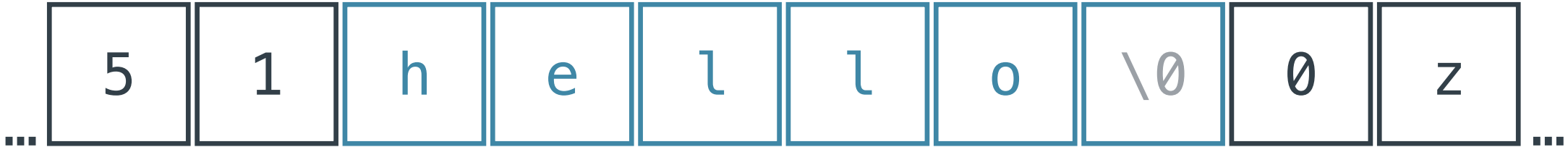
```
cout << s;
```



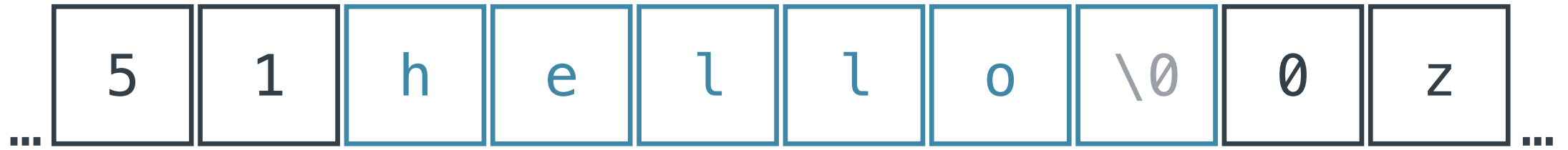

```
cout << s;
```



This is the concept of an *array*.
C++ strings are just an *array* of characters.



Say we want to capitalize the first letter of our string variable, `s...`



array index

`s[0] = 'H';`



`s[0] = 'H';`



`s[0] = 'H';`



Each item in an *array* (e.g., a character in a string) has an *index*.
Indices start from zero and increment by one.


```
string s = "hello";
```



s[0]



s[1]



s[2]



s[3]



s[4]



s[5]



EXERCISE: Write the C++ statement that capitalizes the fifth letter of our string variable, `s`.



But what if we wanted to capitalize *all instances of a character* in some string variable, *s*?

```
string s = "hello";
```



s[0]



s[1]



s[2]



s[2]



s[3]



s[3]



s[4]




s[5]




```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;
13 }
```

 "pepperoni pizza" 'p'

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="pepperoni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="pepperoni pizza"
13 }
```



```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    //s[0]='p'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="pepperoni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    // 'p' != '\0'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="pepperoni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    // 'p' != '\0'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="pepperoni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    // 'p' != '\0'
5     {
6         if (s[i] == target) // target='p'
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    // s="pepperoni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    // 'p' != '\0'
5     {
6         if (s[i] == target) // 'p' == 'p'
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    // s="pepperoni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    // 'p' != '\0'
5     {
6         if (s[i] == target) // 'p' == 'p'
7         {
8             s[i] = toupper(s[i]); // s[0] = 'P'
9         }
10        ++i;
11    }
12    return s;    // s = "Pepperoni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;    //i=1
11    }
12    return s;    //s="Pepperoni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    //s[1]='e'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="Pepperoni pizza"
13 }
```



```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    // 'e' != '\0'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="Pepperoni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    // 'e' != '\0'
5     {
6         if (s[i] == target) // 'e' != 'p'
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    // s="Pepperoni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;    //i=2
11    }
12    return s;    //s="Pepperoni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    //s[2]='p'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="Pepperoni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    // 'p' != '\0'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="Pepperoni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    // 'p' != '\0'
5     {
6         if (s[i] == target) // 'p' == 'p'
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    // s="Pepperoni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0') //s[2]='p'
5     {
6         if (s[i] == target) // 'p'=='p'
7         {
8             s[i] = toupper(s[i]); //s[2]='P'
9         }
10        ++i;
11    }
12    return s; //s="PePperoni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;    //i=3
11    }
12    return s;    //s="PePperoni pizza"
13 }
```



```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    //s[3]='p'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="PePperoni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    // 'p' != '\0'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="PePperoni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    // 'p' != '\0'
5     {
6         if (s[i] == target) // 'p' == 'p'
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    // s="PePperoni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    // 'p' != '\0'
5     {
6         if (s[i] == target) // 'p' == 'p'
7         {
8             s[i] = toupper(s[i]); // s[3] = 'P'
9         }
10        ++i;
11    }
12    return s;    // s = "PePPERoni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;    //i=4
11    }
12    return s;    //s="PePPeroni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    //s[4]='e'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="PePPeroni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    //'e' != '\0'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="PePPeroni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    // 'e' != '\0'
5     {
6         if (s[i] == target) // 'e' != 'p'
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    // s="PePPERoni pizza"
13 }
```



```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;    //i=5
11    }
12    return s;    //s="PePPeroni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    //s[5]='r'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="PePPeroni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    // 'r' != '\0'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="PePPERoni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    // 'r' != '\0'
5     {
6         if (s[i] == target) // 'r' != 'p'
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    // s="PePPERoni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;    //i=6
11    }
12    return s;    //s="PePPeroni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    //s[6]='o'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="PePPeroni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    //'o' != '\0'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="PePPeroni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    // 'o' != '\0'
5     {
6         if (s[i] == target) // 'o' != 'p'
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="PePPERoni pizza"
13 }
```



```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;    //i=7
11    }
12    return s;    //s="PePPERoni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    //s[7]='n'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="PePPeroni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    // 'n' != '\0'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="PePPeroni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    // 'n' != '\0'
5     {
6         if (s[i] == target) // 'n' != 'p'
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="PePPeroni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;    //i=8
11    }
12    return s;    //s="PePPeroni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')        //s[8]='i'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="PePPeroni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    // 'i' != '\0'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="PePPeroni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    // 'i' != '\0'
5     {
6         if (s[i] == target) // 'i' != 'p'
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    // s="PePPeroni pizza"
13 }
```



```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;    //i=9
11    }
12    return s;    //s="PePPeroni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    //s[9]=' '
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="PePPeroni_pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    // ' ' != '\0'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper([i]);
9         }
10        ++i;
11    }
12    return s;    //s="PePPeroni_pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    //' ' != '\0'
5     {
6         if (s[i] == target) //' ' != 'p'
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="PePPeroni_pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;    //i=10
11    }
12    return s;    //s="PePPERoni_pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')        //s[10]='p'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="PePPERoni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    // 'p' != '\0'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper([si]);
9         }
10        ++i;
11    }
12    return s;    //s="PePPERoni pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    // 'p' != '\0'
5     {
6         if (s[i] == target) // 'p' == 'p'
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    // s="PePPERoni pizza"
13 }
```



```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    // 'p' != '\0'
5     {
6         if (s[i] == target) // 'p' == 'p'
7         {
8             s[i] = toupper(s[i]); // s[10] = 'P'
9         }
10        ++i;
11    }
12    return s;    // s = "PePPERoni Pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;    //i=11
11    }
12    return s;    //s="PePPeroni Pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')        //s[11]='i'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="PePPERoni Pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    // 'i' != '\0'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="PePPERoni Pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    // 'i' != '\0'
5     {
6         if (s[i] == target) // 'i' != 'p'
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    // s="PePPERoni Pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;    //i=12
11    }
12    return s;    //s="PePPERoni Pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')        //s[12]='z'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="PePPERoni Pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    // 'z' != '\0'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="PePPERoni Pizza"
13 }
```



```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    // 'z' != '\0'
5     {
6         if (s[i] == target) // 'z' != 'p'
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    // s="PePPERoni Pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;    //i=13
11    }
12    return s;    //s="PePPERoni Pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    //s[13]='z'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="PePPERoni Pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    // 'z' != '\0'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="PePPERoni Pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    //'z' != '\0'
5     {
6         if (s[i] == target) //'z' != 'p'
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="PePPERoni Pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;    //i=14
11    }
12    return s;    //s="PePPERoni Pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    //s[14]='a'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="PePPERoni Pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    //'z' != '\0'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="PePPeroni Pizza"
13 }
```



```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    //'z' != '\0'
5     {
6         if (s[i] == target) //'z' != 'p'
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="PePPeroni Pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;    //i=15
11    }
12    return s;    //s="PePPERoni Pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    //s[15]='\0'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="PePPERoni Pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')    // '\0' == '\0'
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="PePPERoni Pizza"
13 }
```

```
1 string lowerToUpper(string s, char target)
2 {
3     int i = 0;
4     while (s[i] != '\0')
5     {
6         if (s[i] == target)
7         {
8             s[i] = toupper(s[i]);
9         }
10        ++i;
11    }
12    return s;    //s="PePPERoni Pizza"
13 }
```

C-STRINGS

(CHARACTER ARRAYS)

string



```
string s = "hello";
```

==

```
char s[6] = "hello";
```



character array

reserves 32 bytes of space



```
string s = "hello";
```

==

```
char s[6] = "hello";
```



reserves 6 bits

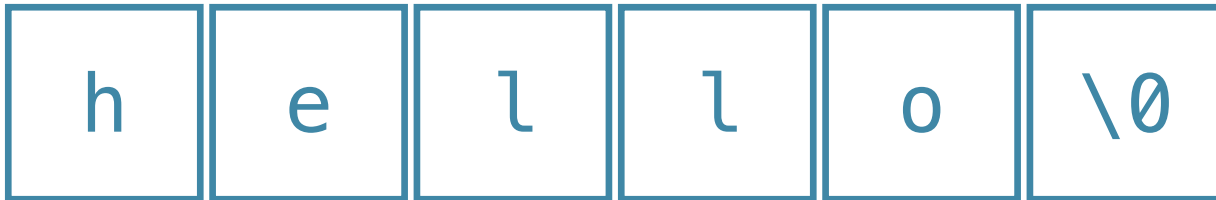


The number in brackets just specifies the size of the array:

- `char c[8] = "hello";`

versus

- `char c[6] = "hello";`



There are three ways to declare character arrays:

- `char c[3] = "hi";`
- `char c[] = "hi";`
- `char c[] = {'h', 'i', '\0'};`

There are three ways to declare character arrays:

- `char c[3] = "hi";`
- `char c[] = "hi";`
- `char c[] = {'h', 'i', '\0'};`

There is one way to access a single character in the array:

- `c[index]`

Annoyingly, you can also update a single character in a character array with *similar* syntax to the declaration...For example:

- `c[1] = 'a';`

- `char c[1] = 'a';` //This creates an array of size *one*, with the contents: 'a' (at index 0).
- `c[1] = 'a';` //This updates an *existing* array of size *two*, at index *1*, with the character 'a'.