

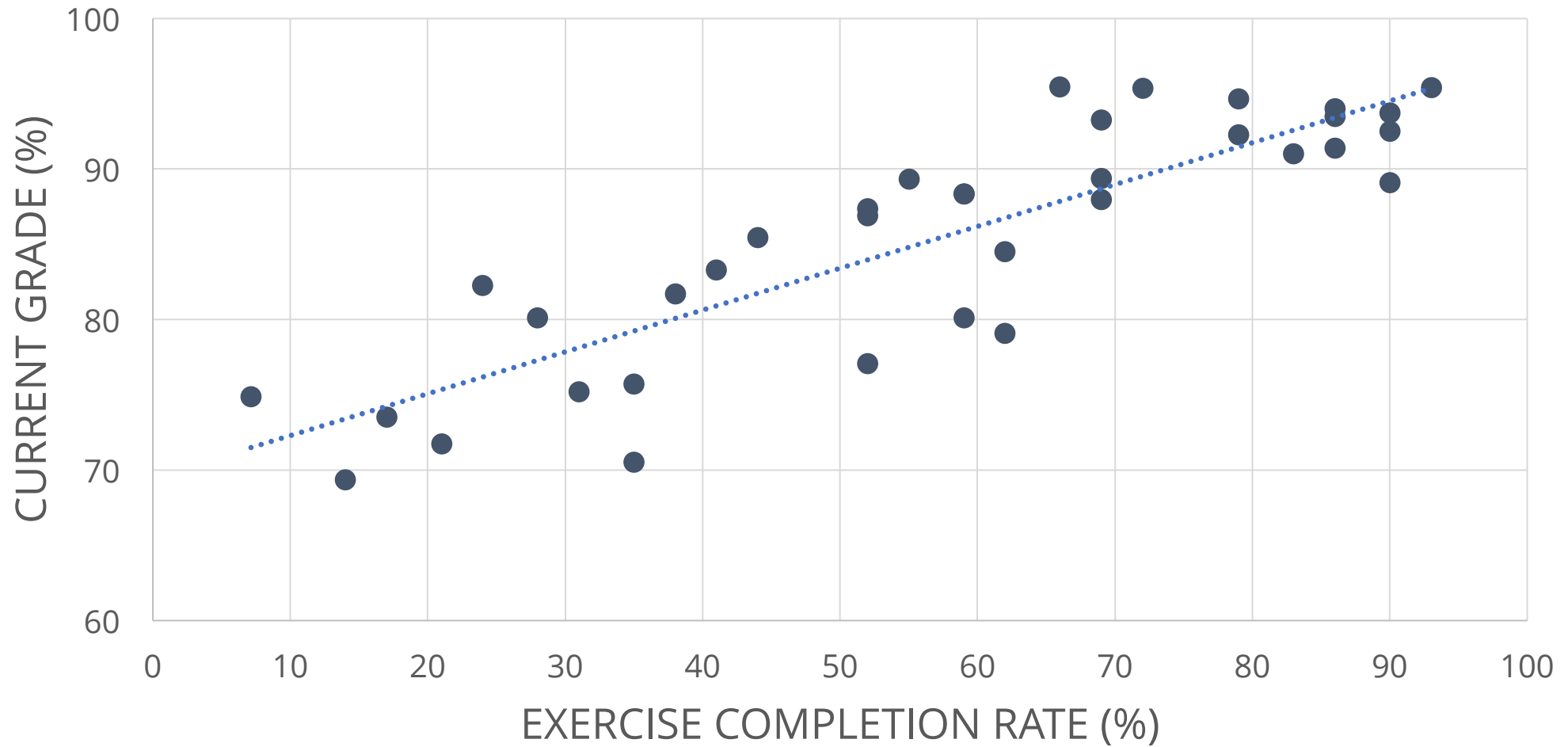
CSCI 1380

APRIL 5/10, 2017

ADMINISTRATIVA

- Exam 2 will be returned next Monday.
- No CS 1 Seminar (Thursdays w/Professor Dietrich) this week.
- Peer evaluations due by April 11.
- A gentle reminder to stay on top of repl.it activities...

CORRELATION BETWEEN COURSE GRADE AND EXERCISE COMPLETION RATE



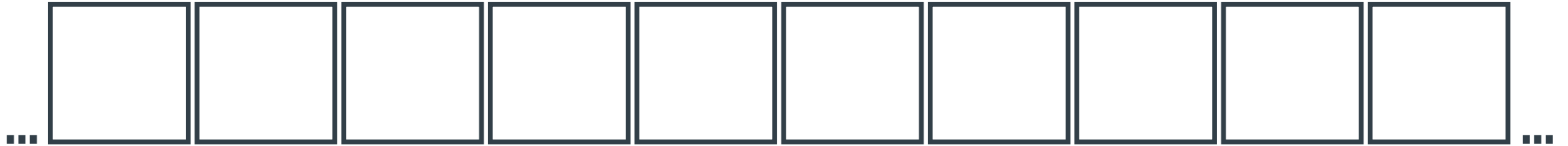
STRINGS REVISITED

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

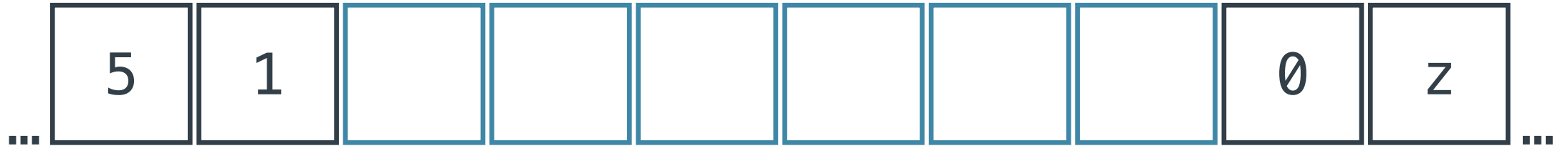
Recall, strings are just an ordered set of characters...


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

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



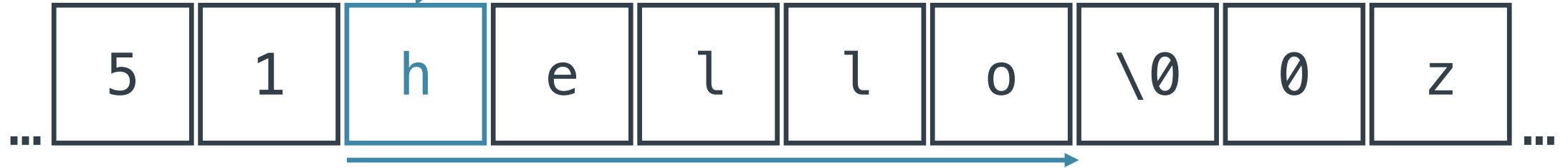
```
string s = "hello";
```





(string)

```
cout << s;
```



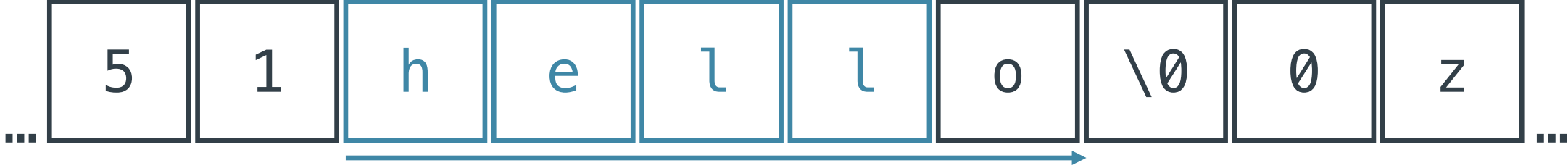
```
cout << s;
```



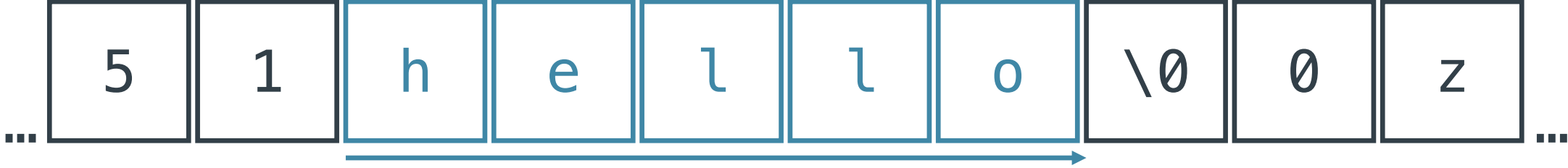
```
cout << s;
```



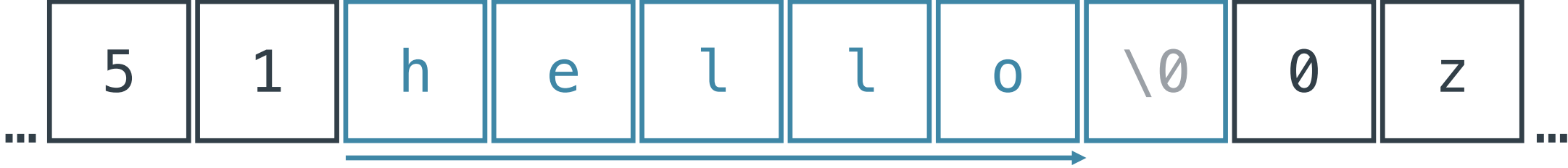
```
cout << s;
```




```
cout << s;
```



```
cout << s;
```



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

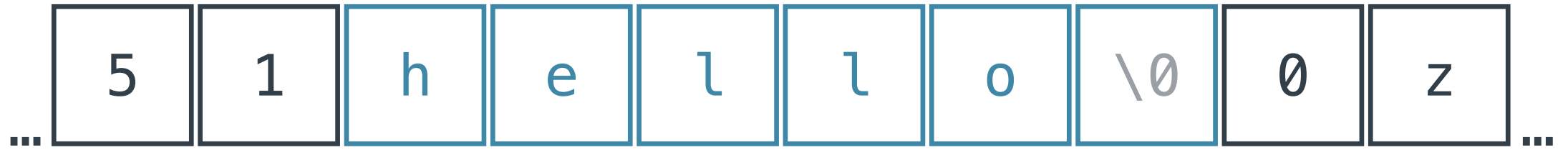


Say we want to capitalize the first letter of our string variable, `s...`



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 }
```

The diagram consists of two orange arrows. The first arrow starts at the text "pepperoni pizza" and points to the parameter 's' in the function signature. The second arrow starts at the character 'p' and points to the parameter 'target' in the function signature.

"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')    // 'a' != '\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')    // 'a' != '\0'
5     {
6         if (s[i] == target) // 'a' != '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 bytes



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

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

versus

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

h	e	l	l	o	\0		
---	---	---	---	---	----	--	--

h	e	l	l	o	\0
---	---	---	---	---	----

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 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]`

- `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'.