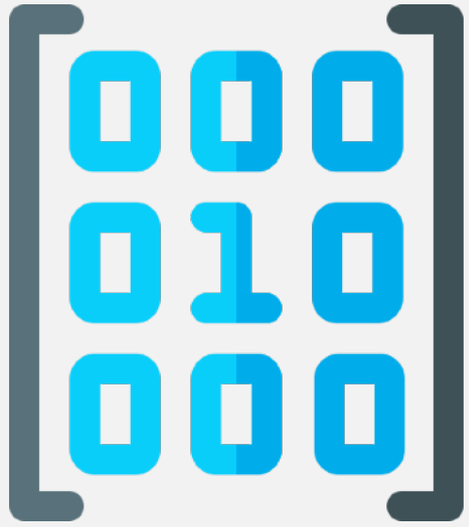
COP 3223H: Introduction to C Programming

Fall 2023

University of Central Florida

Dr. Kevin Moran

Week 9- Class III: 2D-Arrays Part II



Administrivia

- *Small Programming Assignment 3 out.*
  - Due Friday October 27th.
- *Quiz 2 is out*
  - Due on Monday, Oct 23rd
- *Exam 2 is on Wednesday, October 25th*
  - We will review in class on Monday 🙂

Today's Agenda

1. More on 2D Arrays!

Review

2D Arrays

- We have seen that arrays can be useful, but what if we need to store multidimensional data?
- 2D-Arrays to the rescue!
- 2D Arrays allow us to store information in a matrix-like format, as shown below.

	0	1	2	3
0	a	s	d	f
1	n	k	i	v
2	h	j	k	l
3	f	e	o	p

Example of a 2-D Array of Characters

Declaring a 2D Array

```
int x[8][10];
```

Type of values stored in array

Identifier

Number of row elements

Number of column elements

Accessing Array Elements

```
int arr[3][3]  = { {24, 15, 34}, {26, 134, 194}, {67, 23, 345} };
```

	0	1	2
0	24	15	34
1	26	134	194
2	67	23	345

```
int test_val = arr[1][0];

printf("First element in second row is: %d\n", test_val);
```

Default Values for Different Data Types

- `int` - 0
- `double` 0.0
- `float` - 0.0
- `char` - ‘\0’ Null Character
- `pointer` - Null

2D-Arrays

2D-Array Stack Visualization

Here

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                   {26, 134, 194},
                   {67, 23, 345} };

for(int i =0; i < 3; i++){
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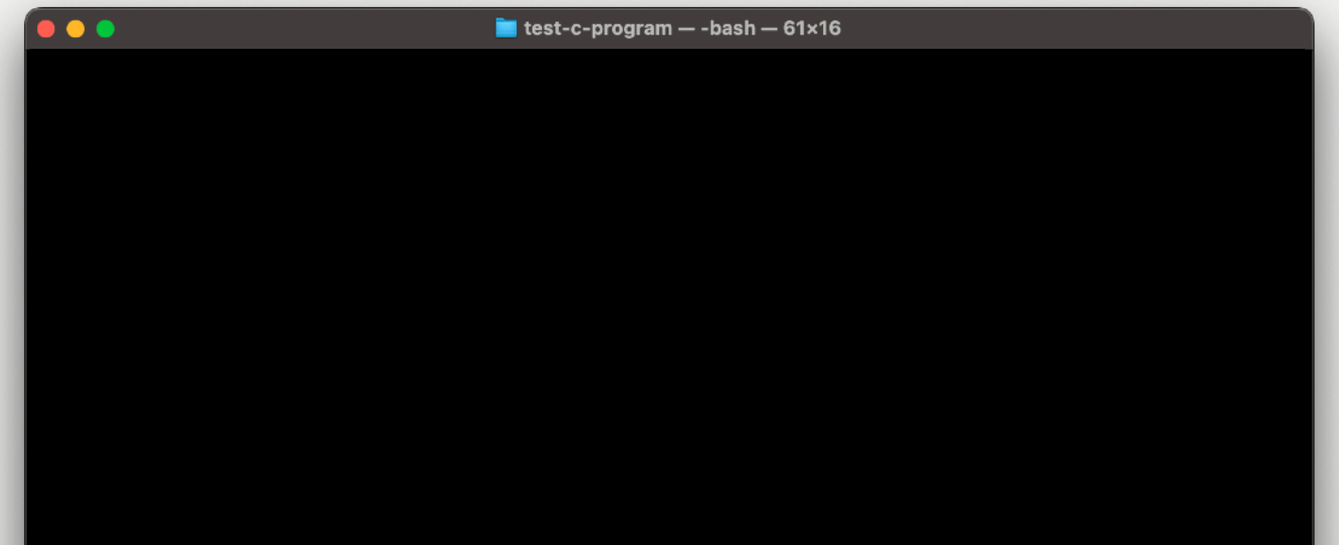

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AA7	
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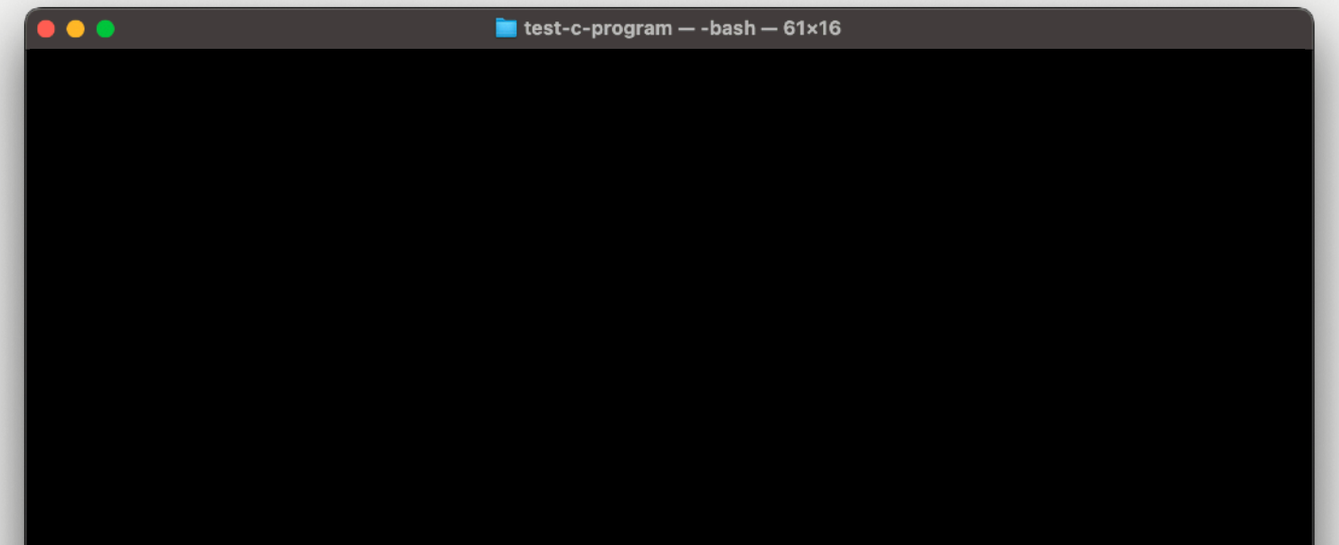

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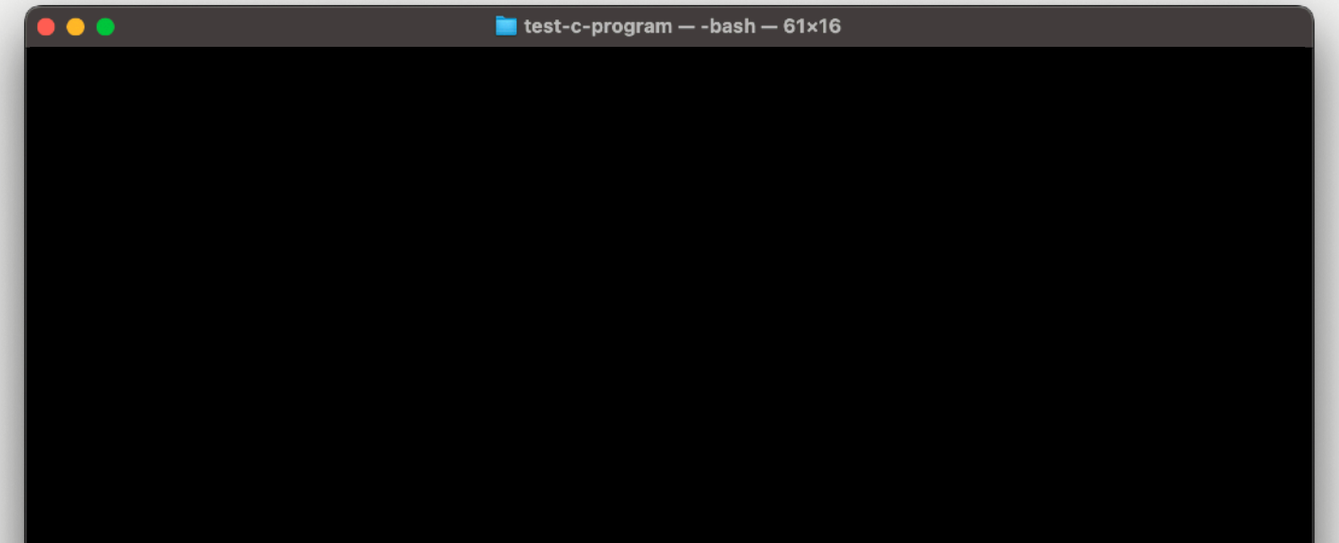

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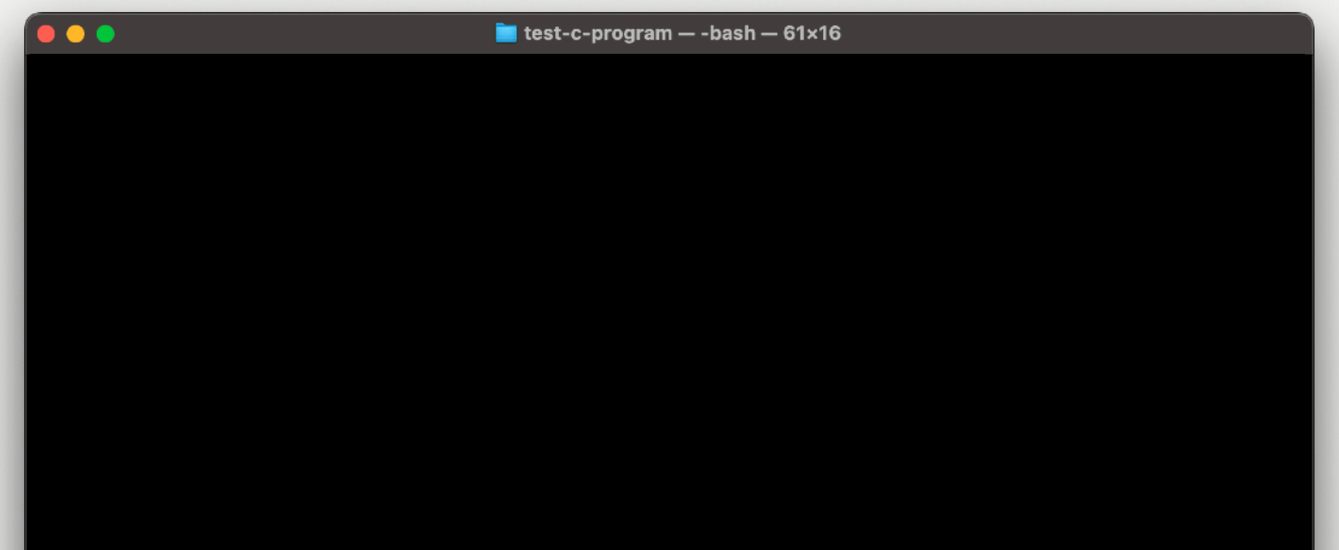

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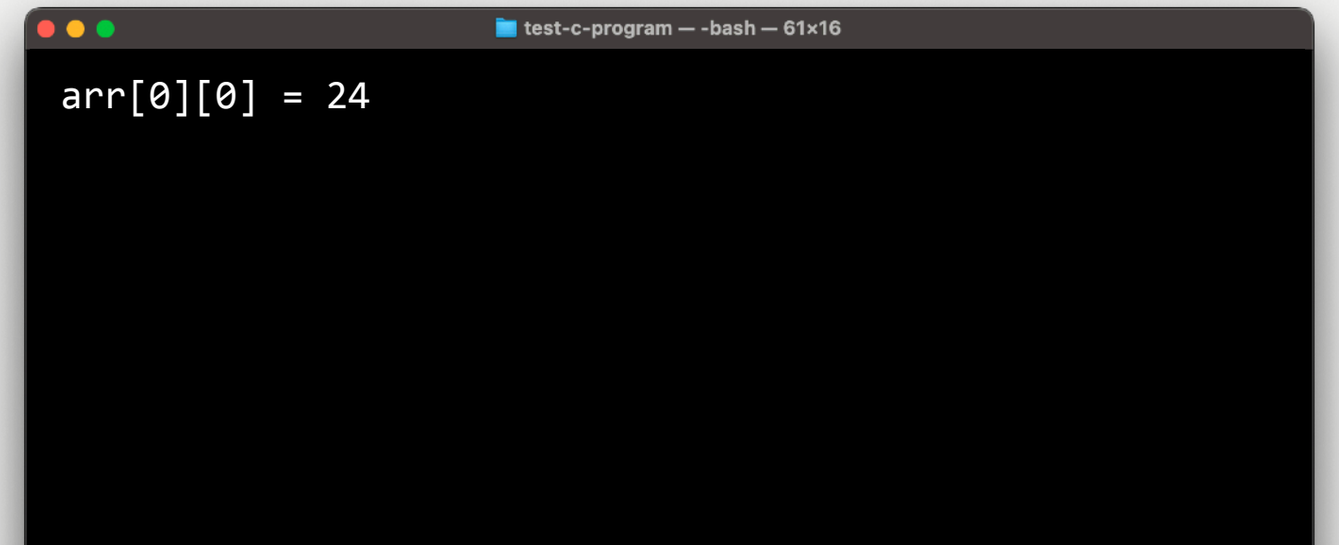

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}
```

i = 0 j = 1

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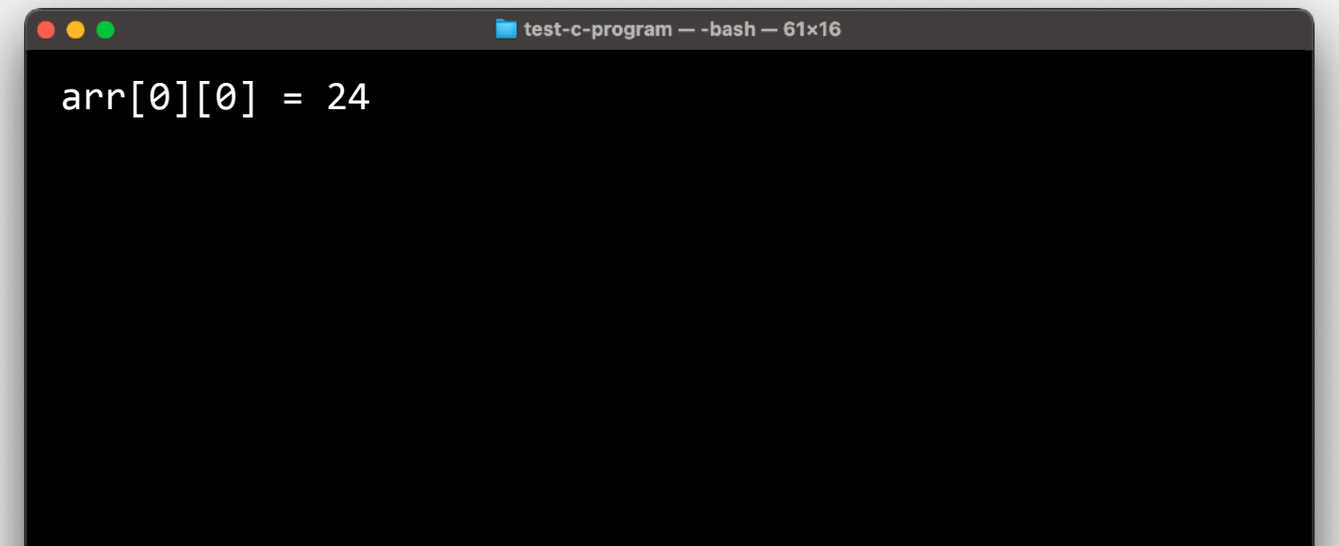

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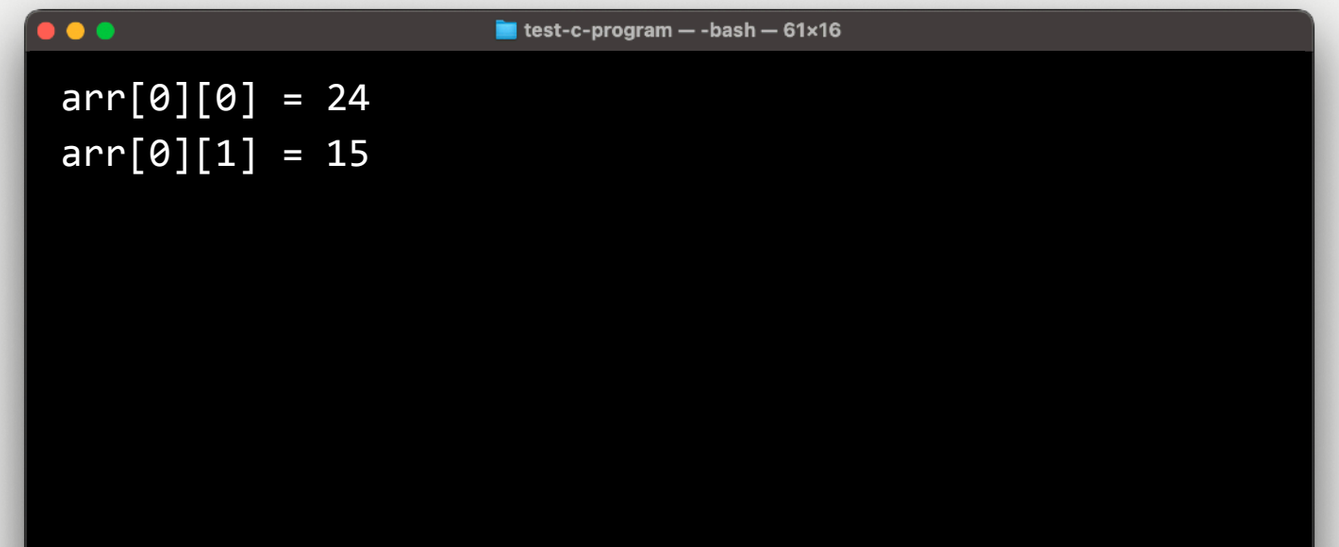

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    }
}
```

Here

```
i = 0    j = 2
```

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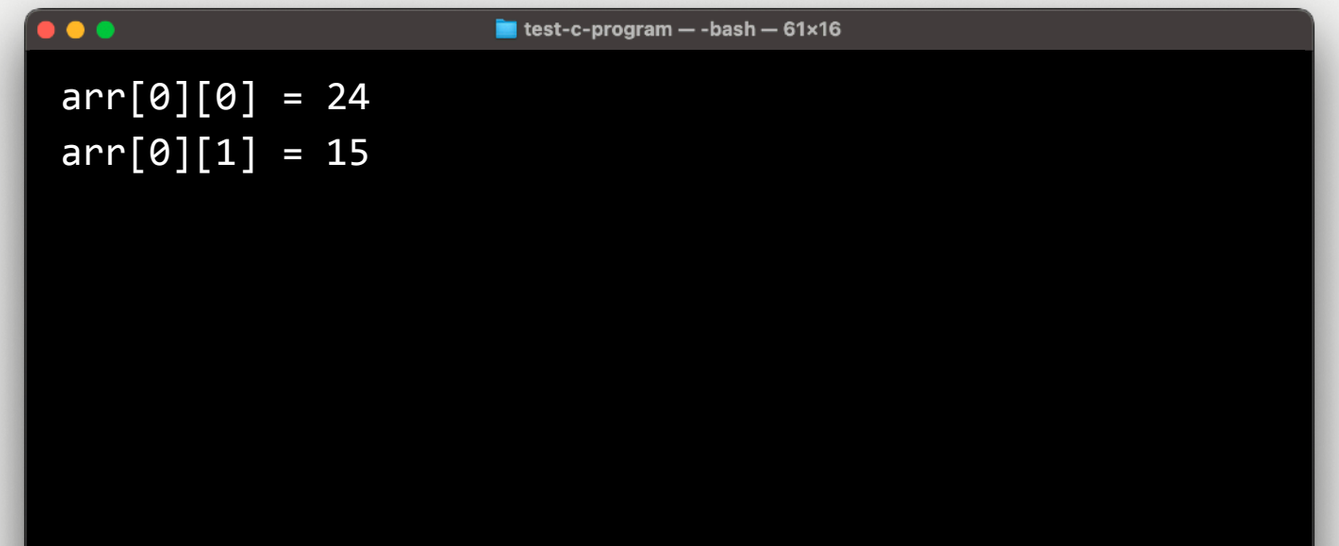

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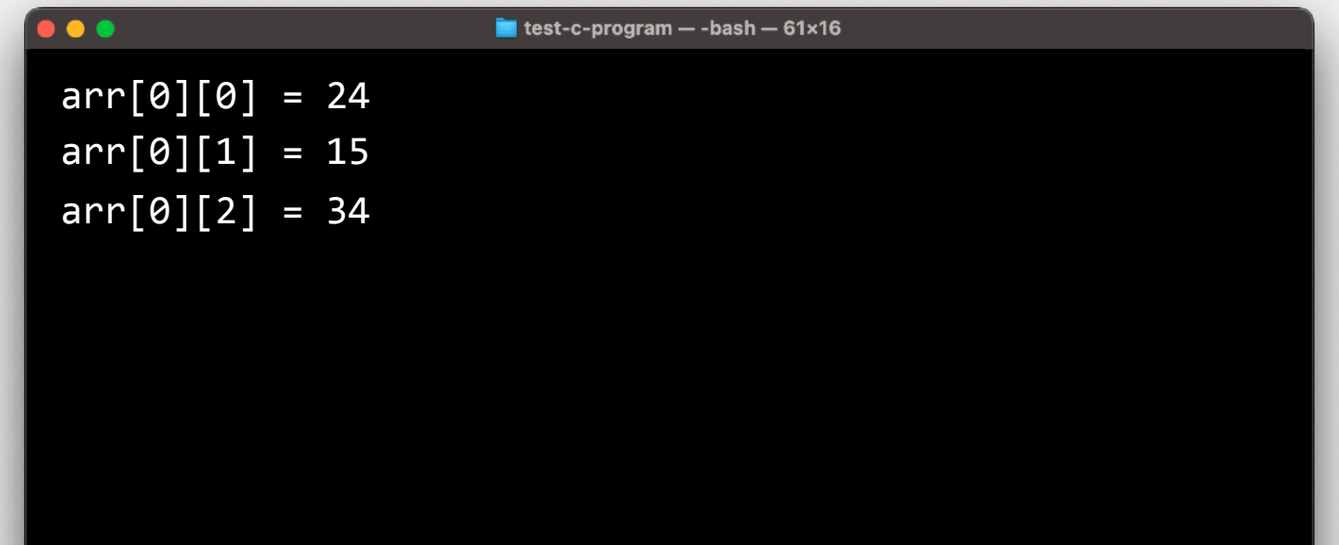

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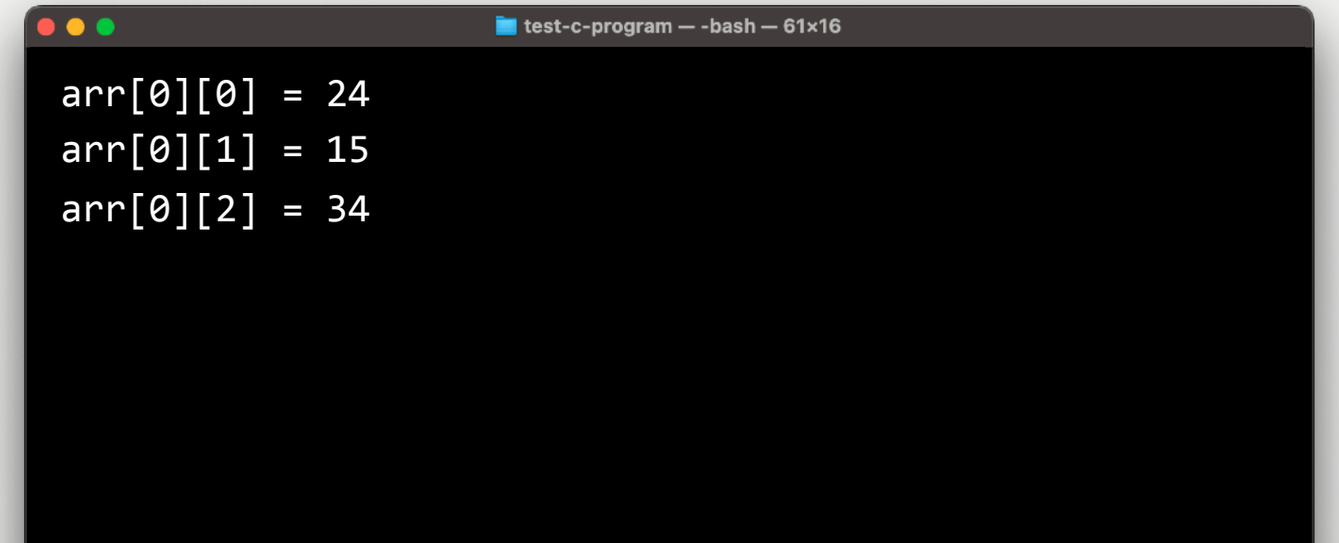

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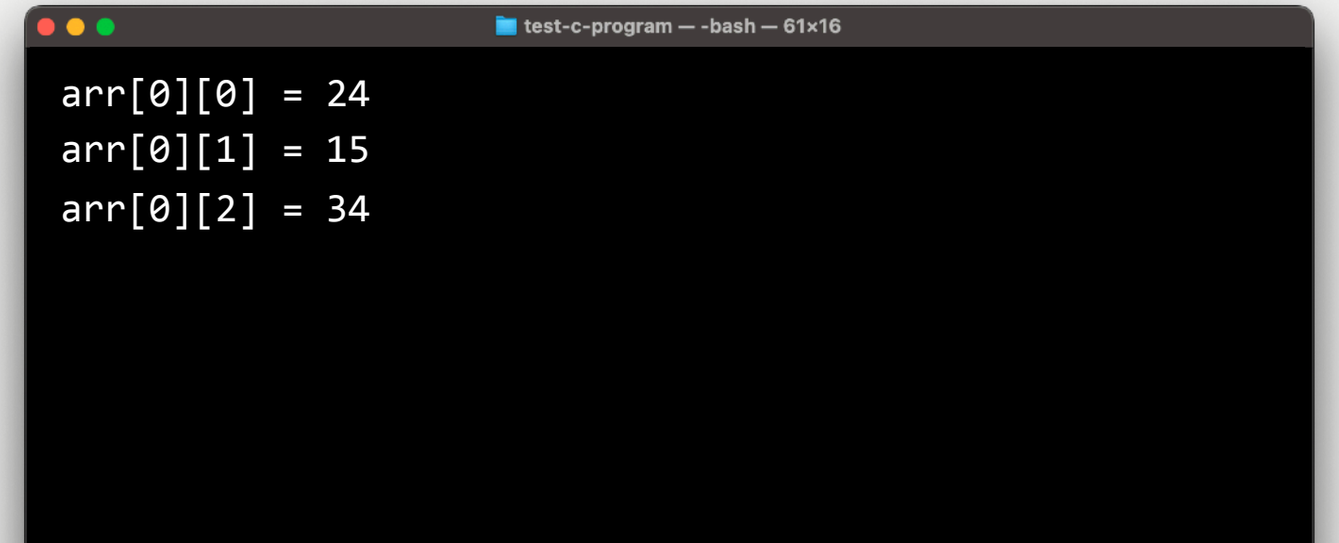

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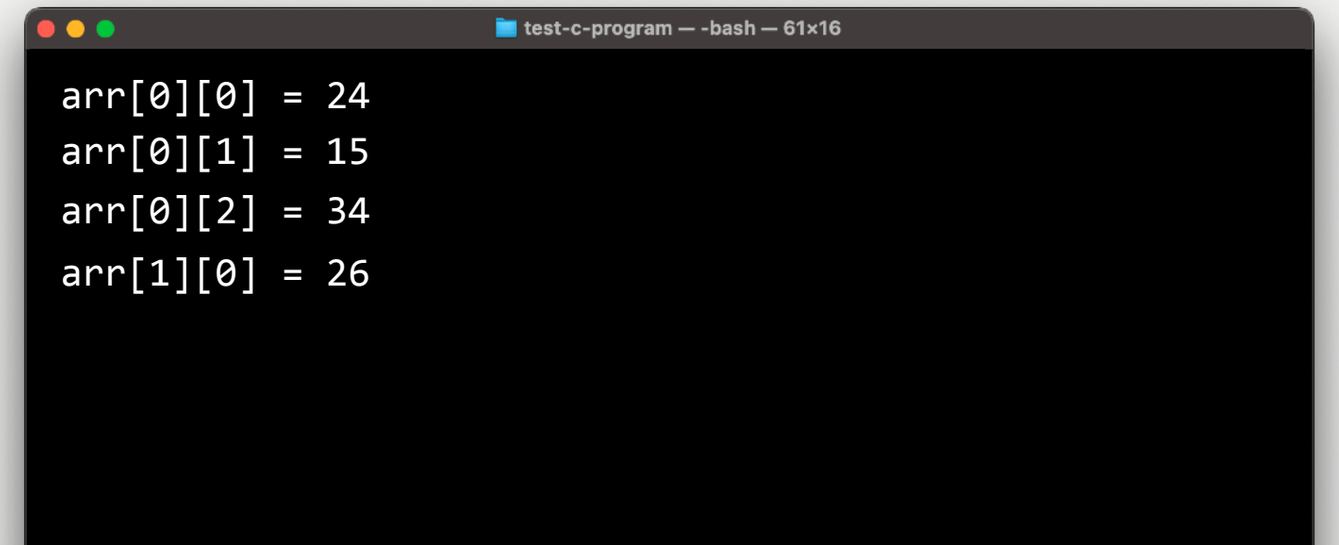

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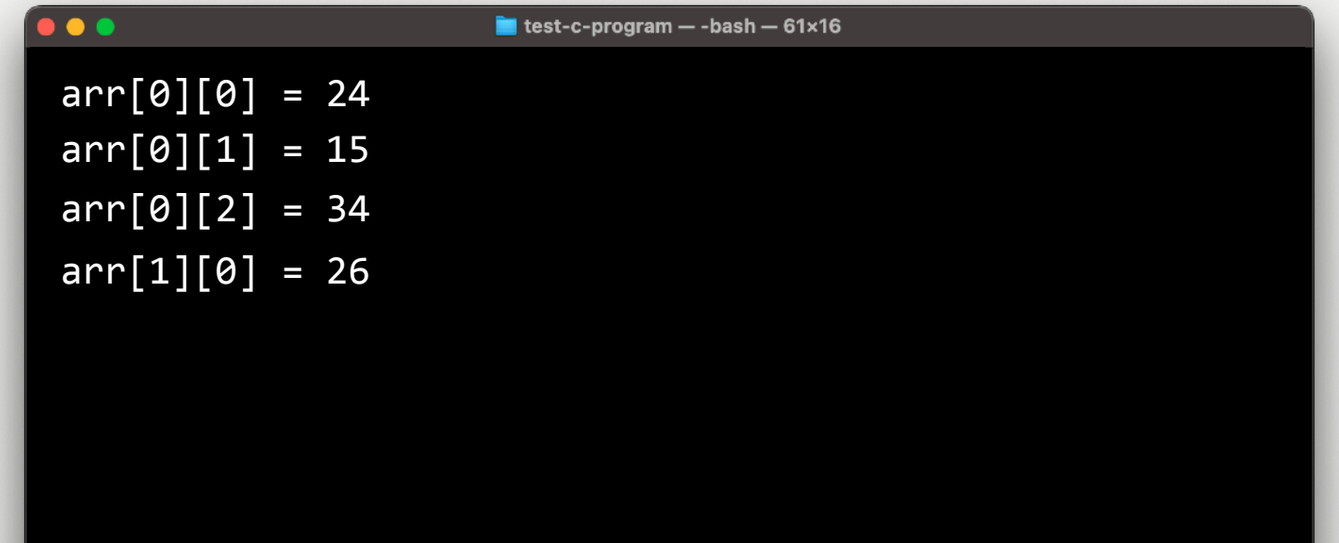

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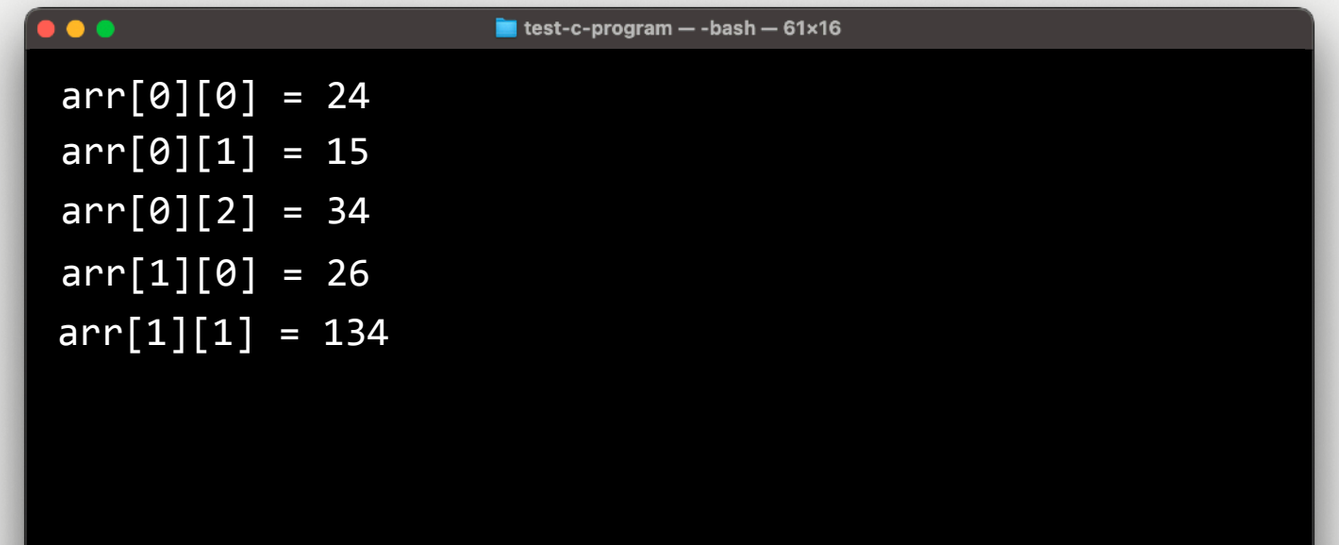

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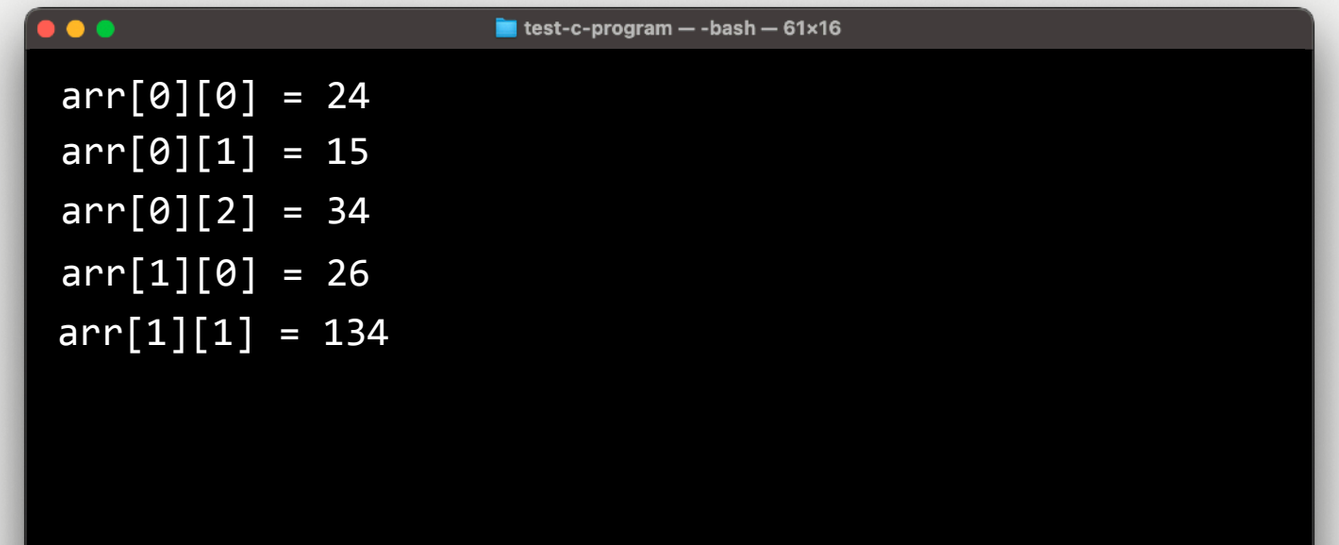

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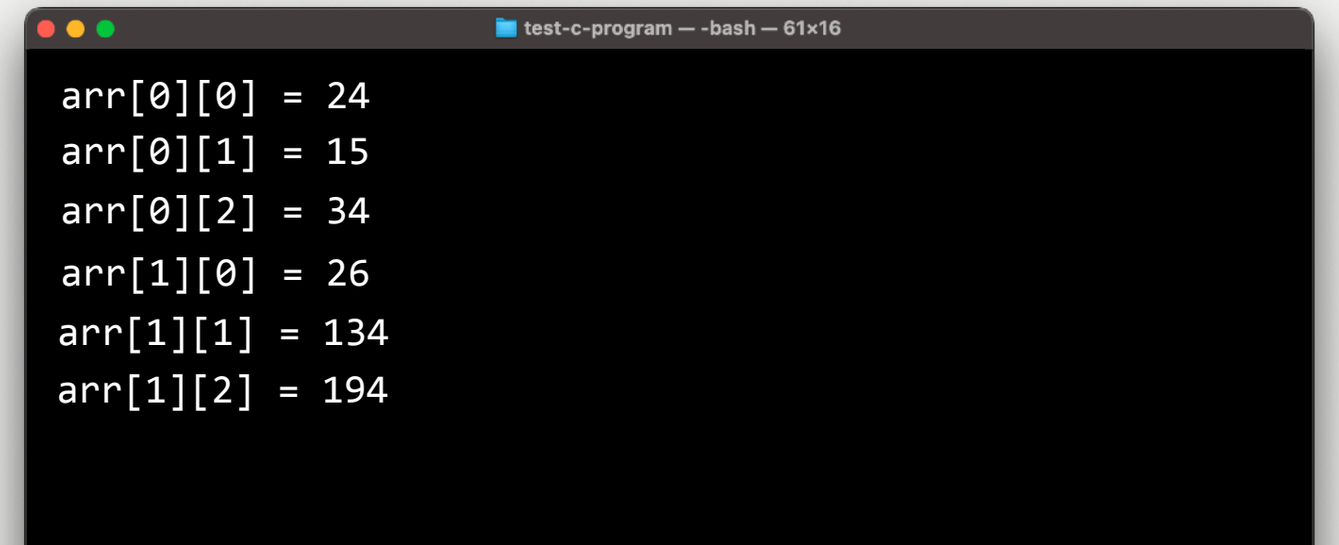

Demo

Acknowledgements

Slides adapted from Dr. Andrew Steinberg's COP 3223H course