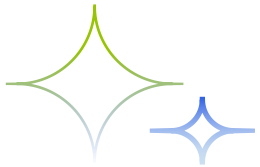

MONTANA
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Programming with C I

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String Basics

- **null character**
  - character ‘\0’ that marks the end of a string in C
- **A string in C is implemented as an array.**
  - char string_var[30];
  - char str[20] = “Initial value”;
- **An array of strings is a 2-dimensional array of characters in which each row is a string.**
- **String library string.h**

Input/Output

- **printf and scanf can handle string arguments**
- **use %s as the placeholder in the format string**
  - char president[20];
  - scanf(“%s\n”, president);
  - printf(“%s\n”, president);

Initializing Strings

- **sizeof() gives size in bytes**
- **strlen() gives length of string**

char string[16] = “hello world”;

sizeof() is 16
strlen() is 11

char *str = “hello world”;

sizeof() is 8
strlen() is 11

char s[] = “hello world”;

sizeof() is 12
strlen() is 11

String Terminology

- **string length**
  - in a character array, the number of characters before the first null character strlen() gives length of string

- **empty string**
  - a string of length zero
  - the first character of the string is the null character

Scanning a Full Line

- For interactive input of one complete line of data, use the fgets function from stdio.
- Arguments: destination string, max characters to read, input
- Output: destination string or NULL if nothing read
- The \n character is stored if space.

```
fgets(<dest_string>, <num_chars>, <input>)
```

Strings Review 10/11

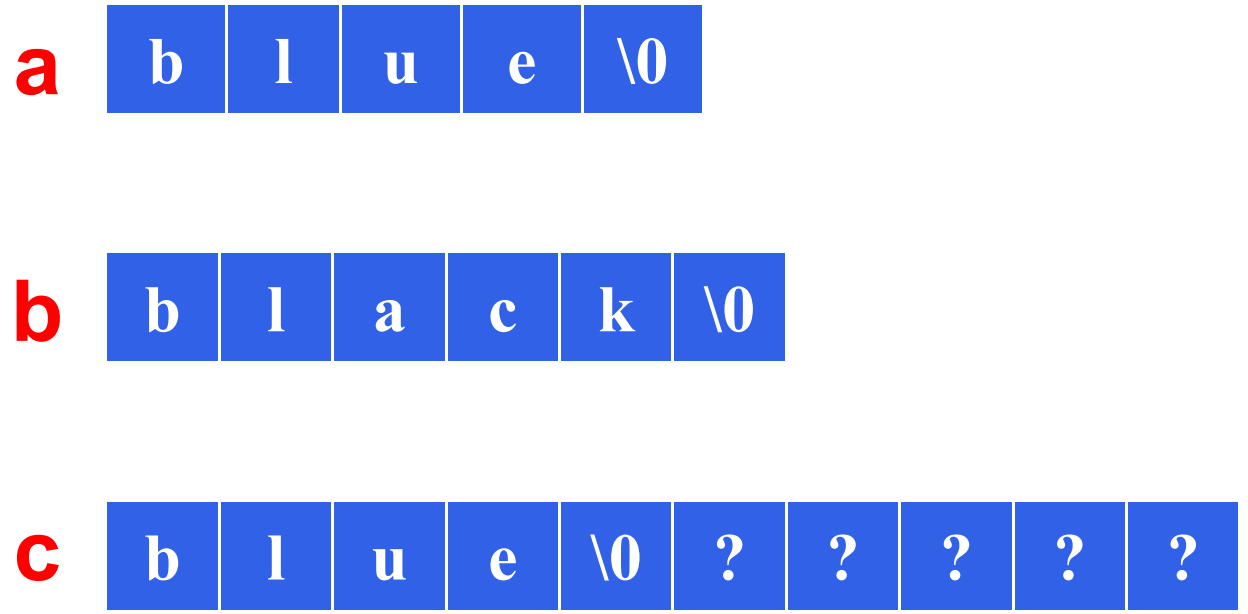
- In C, strings are…
- To store an array of strings, we need a…
- All strings must end with the…
- We can read in a full line (including spaces) as a string using the function…

String Assignment

- **strcpy**
  - copies string in second argument into its first argument
    - **strcpy(s1, “hello”);**
  - subject to buffer overflow
- **strncpy**
  - takes an argument specifying the number of chars to cope
  - if the string to be copies is shorter, the remaining characters stored are null
    - **strncpy(s2, “inevitable”, 5);**

= does not work!

String Comparison



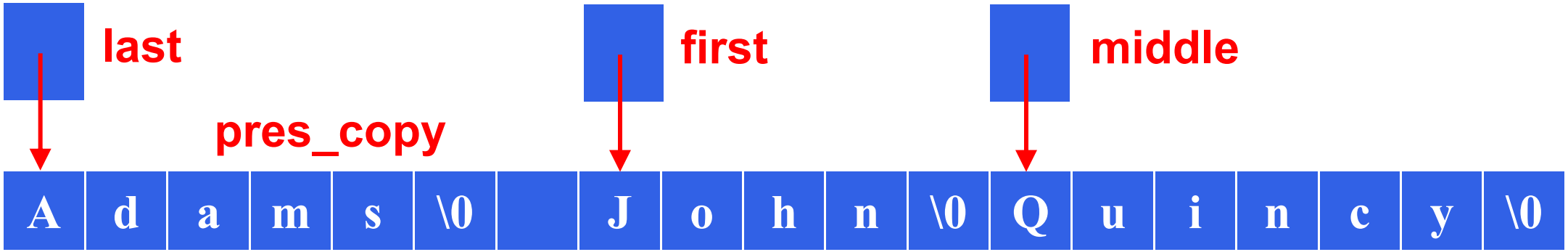
String Comparison

Table Possible Results of strcmp(str1, str2)

Relationship	Value Returned	Example
str1 is less than str2	negative integer	str1 is “marigold” str2 is “tulip”
str1 equals str2	zero	str1 and str2 are both “end”
str1 is greater than str2	positive integer	str1 is “shrimp” str2 is “crab”

String tokenization

```
char *last, *first, *middle;
char pres[20] = “Adams, John Quincy”;
char pres_copy[20];
strcpy(pres_copy, pres);
```




```
last = strtok(pres_copy, “, ”);
first = strtok(NULL, “, ”);
middle = strtok(NULL, “, ”);
```

THE END

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