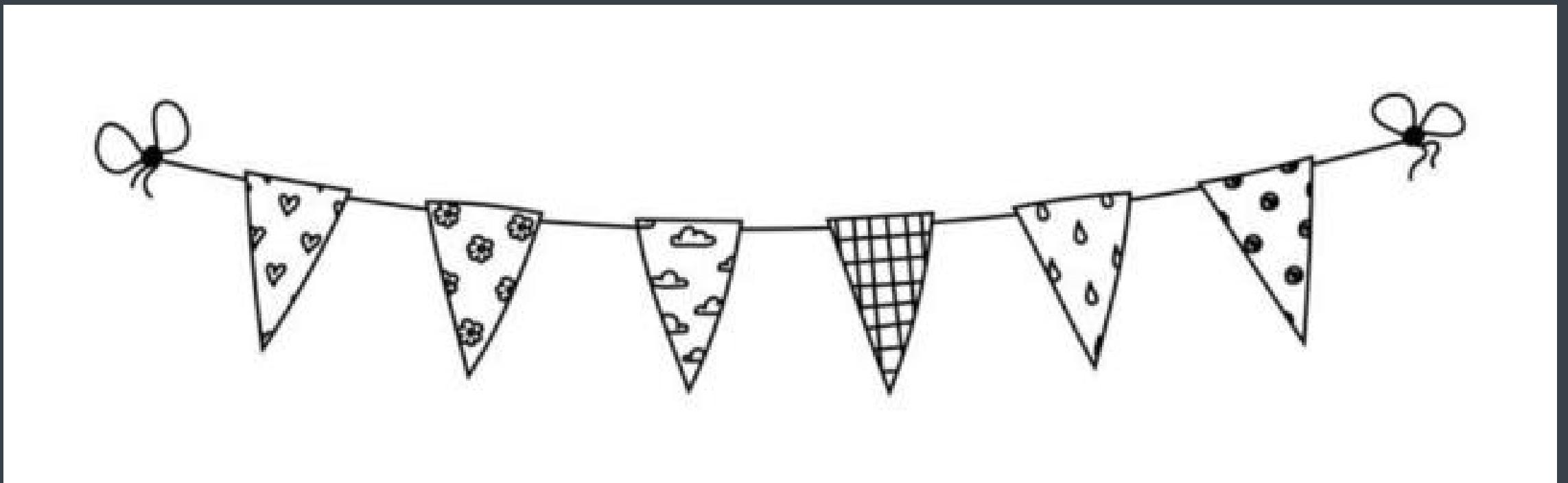


# Strings

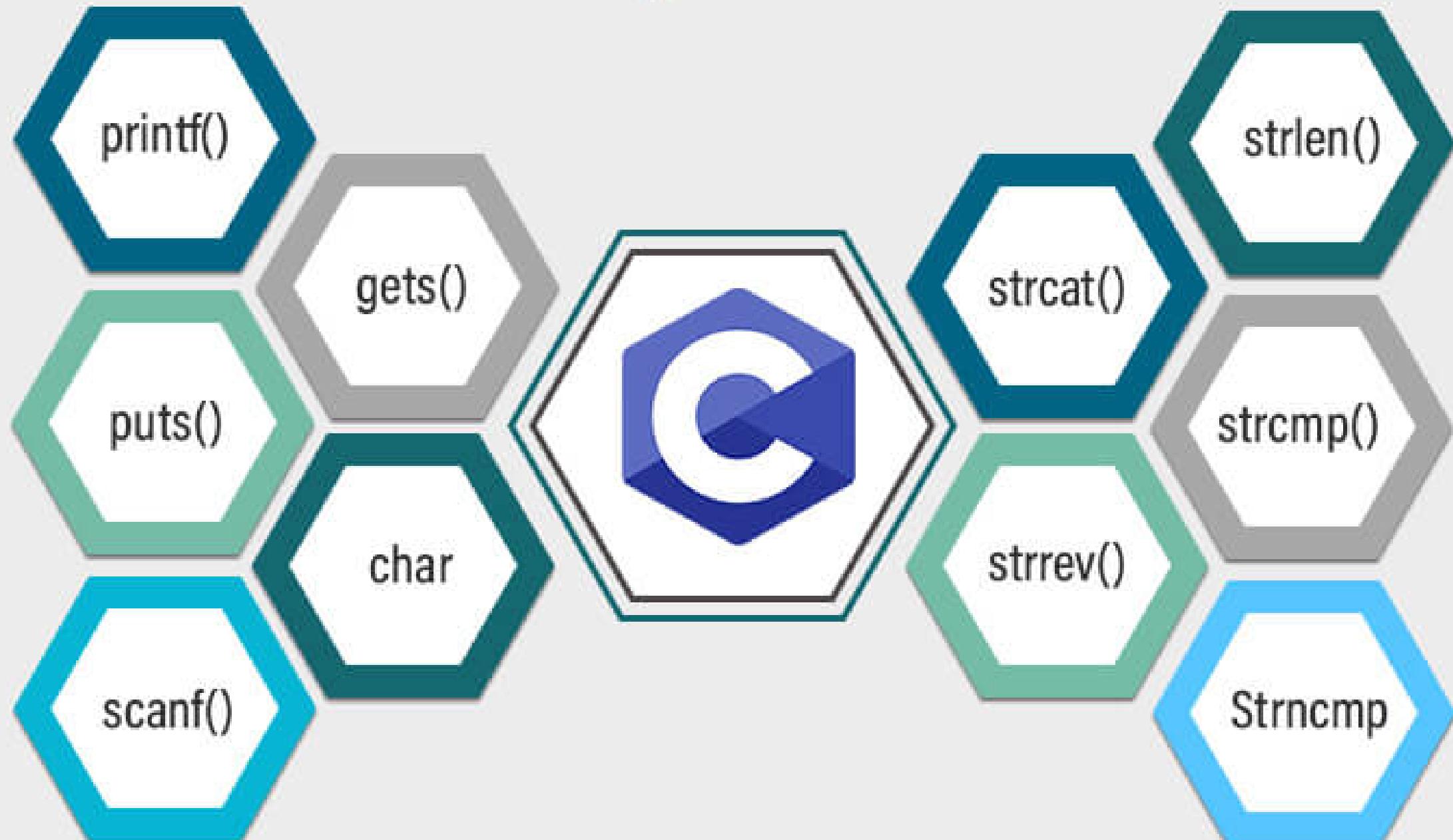


## Definition

fundamental data type used to represent textual data. They are sequences of characters and are enclosed in double quotes (" ")



# C String Functions



## Creating Strings

Strings in C are sequences of characters represented as arrays of characters (char arrays). They are defined using double quotes (" "), and the last character is a null character '\0' to indicate the end of the string.

```
// Declare a character array for the string  
char greeting[] = "Hello, World!";
```

Variable	H	e	I	I	o	\0
----------	---	---	---	---	---	----

# String Indexing

Strings are ordered sequences, and you can access individual characters using indexing. C uses zero-based indexing, where the first character has an index of 0.

Index	0	1	2	3	4	5
Variable	H	e	I	I	o	\0

# String Manipulation Techniques

- **Appending:** Concatenating one string to the end of another.
- **Truncating:** Removing characters from the end of a string.
- **Extracting Substrings:** Selecting a portion of a string as a separate substring

# Appending

```
char str1[50] = "Hello, ";
char str2[] = "World!";
strcat(str1, str2);
printf("Appended String: %s\n", str1);
```

“Hello” + “World” = “ HelloWorld ”

The diagram illustrates the concatenation of two strings. At the top, the expression “Hello” + “World” = “ HelloWorld ” is shown in green. Below it, three red arrows point downwards from the words “Hello”, “World”, and “HelloWorld” to the labels “String 1”, “String 2”, and “Result” respectively. This visualizes how the characters of the two input strings are joined together to form the final result.

String 1    String 2    Result

# Truncating

```
char text[] = "Carrot";
text[3] = '\0';
printf("Truncated String: %s\n", text);
```

Carrot

Car

# String Functions and Operations

- **strlen()**: Calculates the length of a string.
- **strcpy()**: Copies one string into another.
- **strcat()**: Concatenates one string onto the end of another.
- **strcmp()**: Compares two strings for equality.

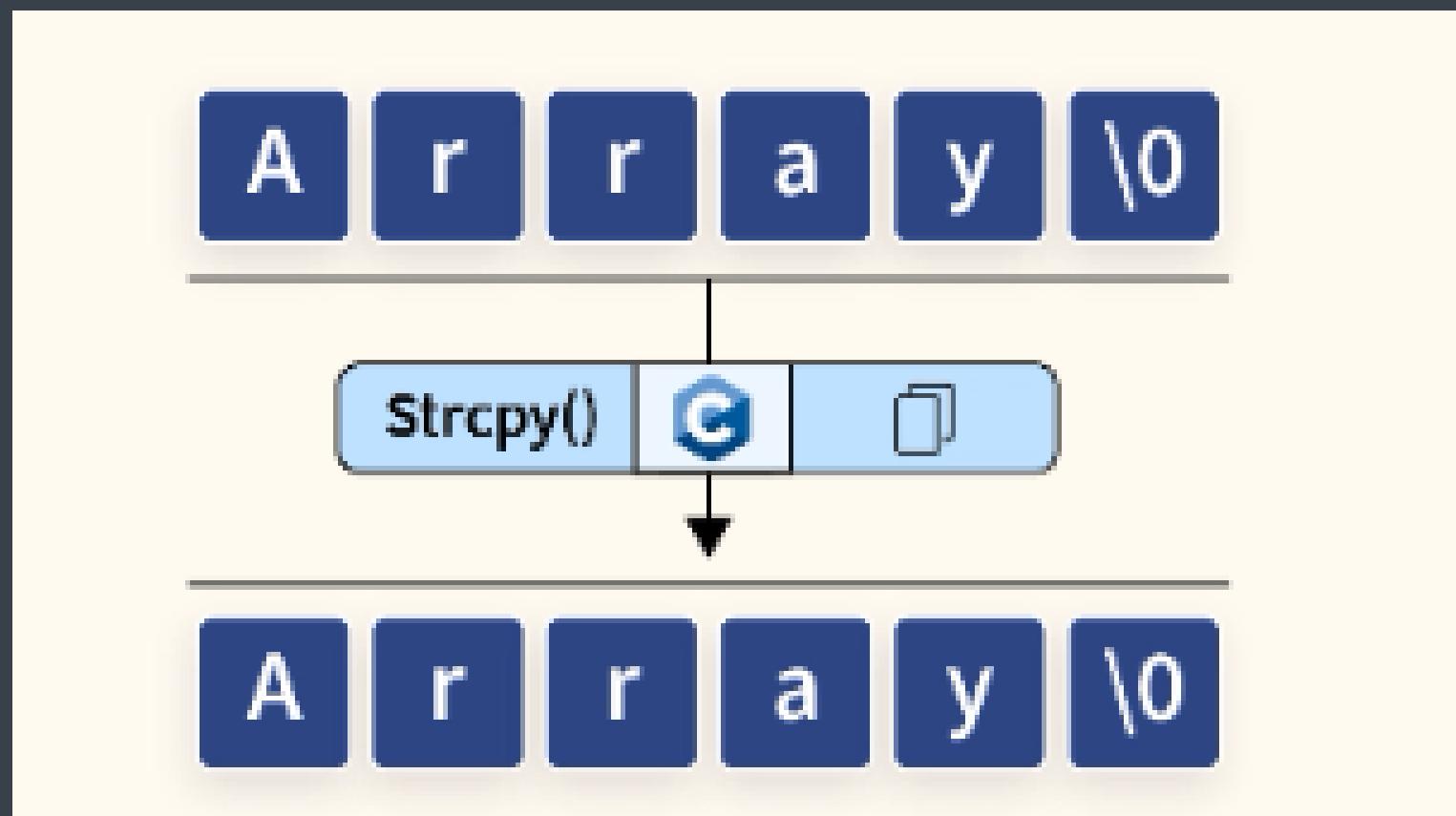
# strlen()

```
char text[] = "abcdefg!";  
int length = strlen(text);  
printf("Length of the string: %d\n", length);
```



# strcpy()

```
char source[] = "Array";
char destination[20];
strcpy(destination, source);
printf("Copied String: %s\n", destination);
```



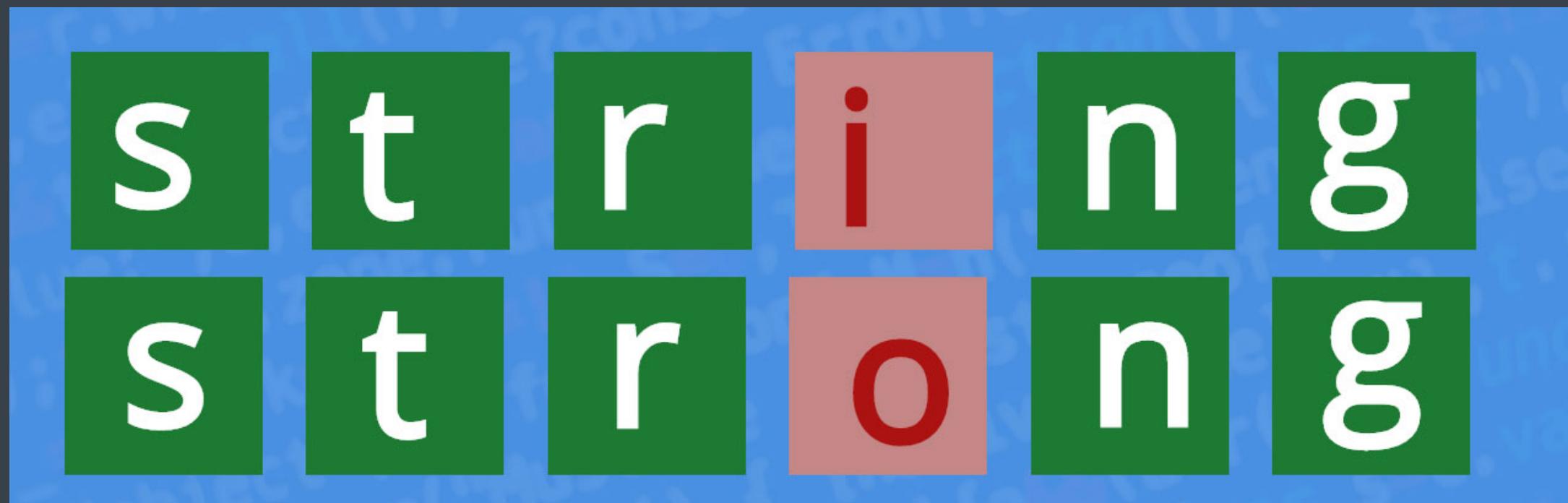
# strcat()

```
char str1[20] = "Hello, ";
char str2[] = "World!";
strcat(str1, str2);
printf("Concatenated String: %s\n", str1);
```

“Hello” + “World” = “Hello World”  
↓      ↓      ↓  
String 1   String 2   Result

# strcmp()

```
char stri[] = "string";
char str2[] = "strong";
int result = strcmp(stri, str2);
```



# Handling Escape Sequences in Strings

- \n: Newline
- \t: Tab
- \\: Backslash
- \" : Double quote

# Handling Escape Sequences in Strings

```
printf("This is a string with escape sequences:\n");
printf("Line 1\tTabbed\n");
printf("Line 2\\Backslash\n");
printf("Line 3\"Double-quoted\"\n");
```

This is a string with escape sequences:  
Line 1 Tabbed  
Line 2\Backslash  
Line 3"Double-quoted"

# String Formatting

- Using format specifiers with `printf()` and `sprintf()` to format strings.
- Examples include `%s` for strings, `%d` for integers, and `%f` for floating-point numbers.

# Pattern Matching and Searching in Strings

- Utilizing functions like **strstr()** to search for a substring within a string.
- **Regular expressions** for advanced pattern matching

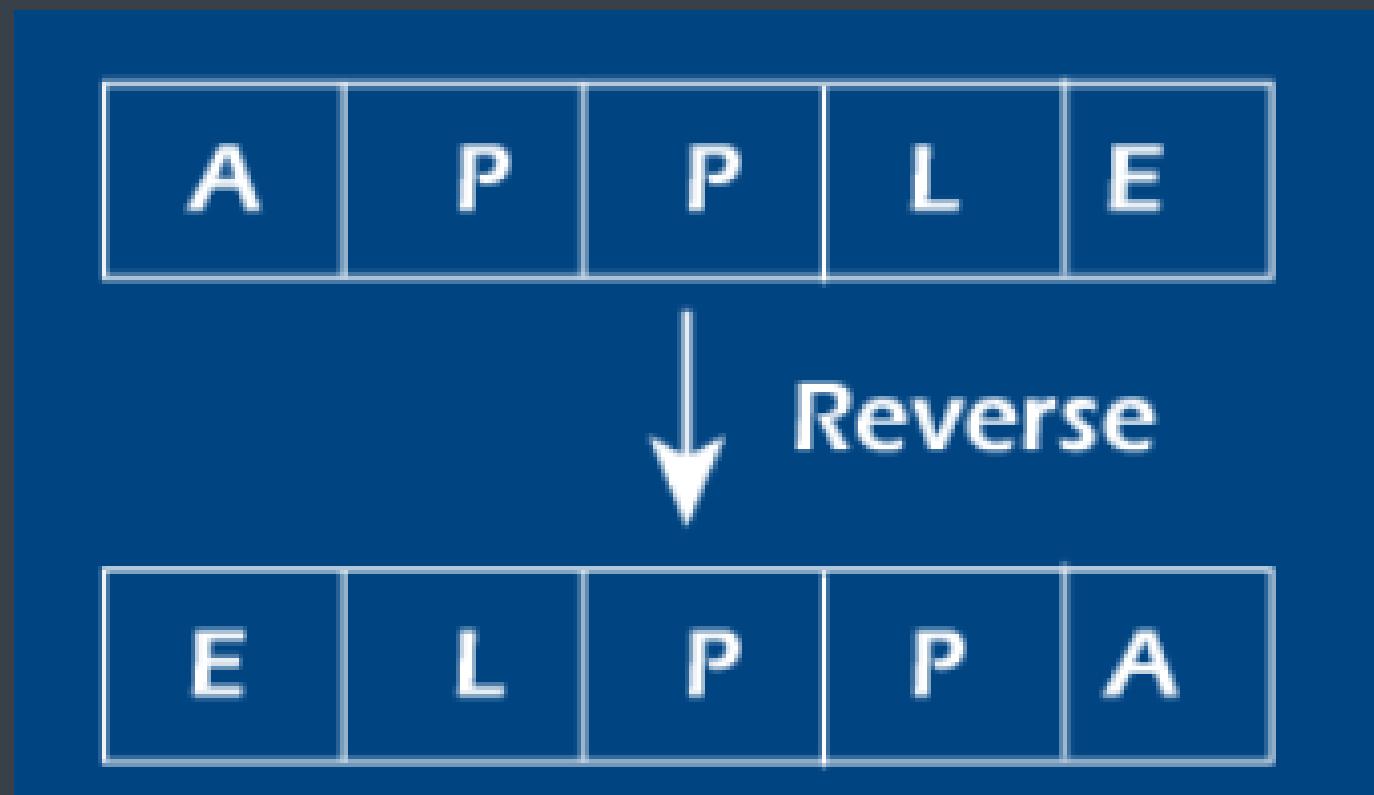
# Checking for Palindromes

- A palindrome is a string that reads the same forwards and backward (e.g., "racecar").
- To check for palindromes, you can compare characters from both ends of the string.



# Reversing Strings

- Reversing a string involves swapping the characters from the start with those from the end.
- This can be done using loops or recursion.



# Decimal to Binary and Binary to Decimal Conversion

- Converting decimal numbers to binary involves repeatedly dividing by 2 and recording remainders.
- Converting binary numbers to decimal involves summing powers of 2 based on the binary digits.