Standard Input/Output Functions

printf() and scanf():

- **printf()** is used to output data to the console.
- **scanf()** is used to read input from the console.

Example - Using printf() and scanf():

```
int num;
printf("Enter an integer: ");
scanf("%d", &num); // Note the '&' to get the address of the variable
printf("You entered: %d\n", num);
```

Other Standard I/O Functions:

- **getchar()** and **putchar()** are used for single character input and output.
- **gets()** and **puts()** are used for reading and writing strings.

String Manipulation

String Functions:

- C provides a library of functions for string manipulation.
- Common functions include **strlen()**, **strcpy()**, **strcat()**, **strcmp()**, and more.

Example - Using String Functions:

Code

```
#include <string.h>
char str1[] = "Hello, ";
char str2[] = "World!";
strcat(str1, str2); // Concatenate str2 to str1
printf("%s\n", str1); // Output: "Hello, World!"
```

Structures and Unions

Structures:

- Structures allow you to create custom data types to group related data.

Example:

Code

```
struct Person {
    char name[50];
    int age;
};
```

Unions:

- Unions are similar to structures but allow you to store only one value at a time.

  Example:

Code

```
union Value {
   int integer;
   float floating;
   char character;
};
```

Preprocessor Directives

#include, #define, and #ifdef:

- Preprocessor directives are used to modify the source code before compilation.
- **#include** is used to include header files.
- **#define** is used to create macros.
- **#ifdef** is used for conditional compilation.

Example - Using #define:

Code

```
#define PI 3.14159
```

Example - Using #ifdef:

Code

```
#ifdef DEBUG
   // Debugging code
#endif
```