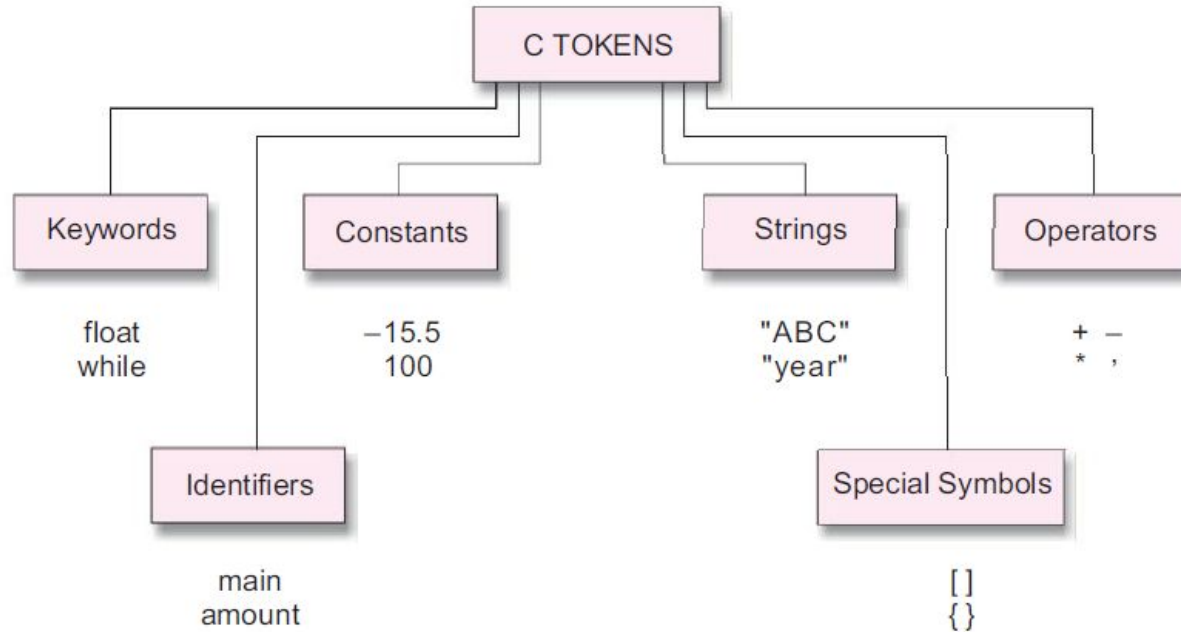


Data Types and Variables

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C Tokens



`main` can be used as identifier.

Data Types

- Set of values
- Set of operations on these values

In Mathematics:

- Natural numbers 1, 2, 3,
- +, -, *, /, >, <

Basic Data Types in C

- **int**
 - bounded integer
 - ex: -5 or 762
 - **float**
 - real numbers
 - ex: 3.14 or 2.0
 - **double**
 - real numbers with more precision
 -
 - **char**
 - single character
- **%d**
 - **%f**
 - **%lf**
 - **%c**

Characters

- Characters are written in " (single quotes)
- Case sensitive
 - meaning 'a' and 'A' are not the same.
- Types distinguishes similar looking values
 - meaning 6 and '6' are not the same.
- Special characters
 - '\n', '\', '\"'

Can you guess the output?

```
#include<stdio.h>

void main() {

    int y = 2147483648;

    printf("%d", y);

}
```

Output: -2147483648

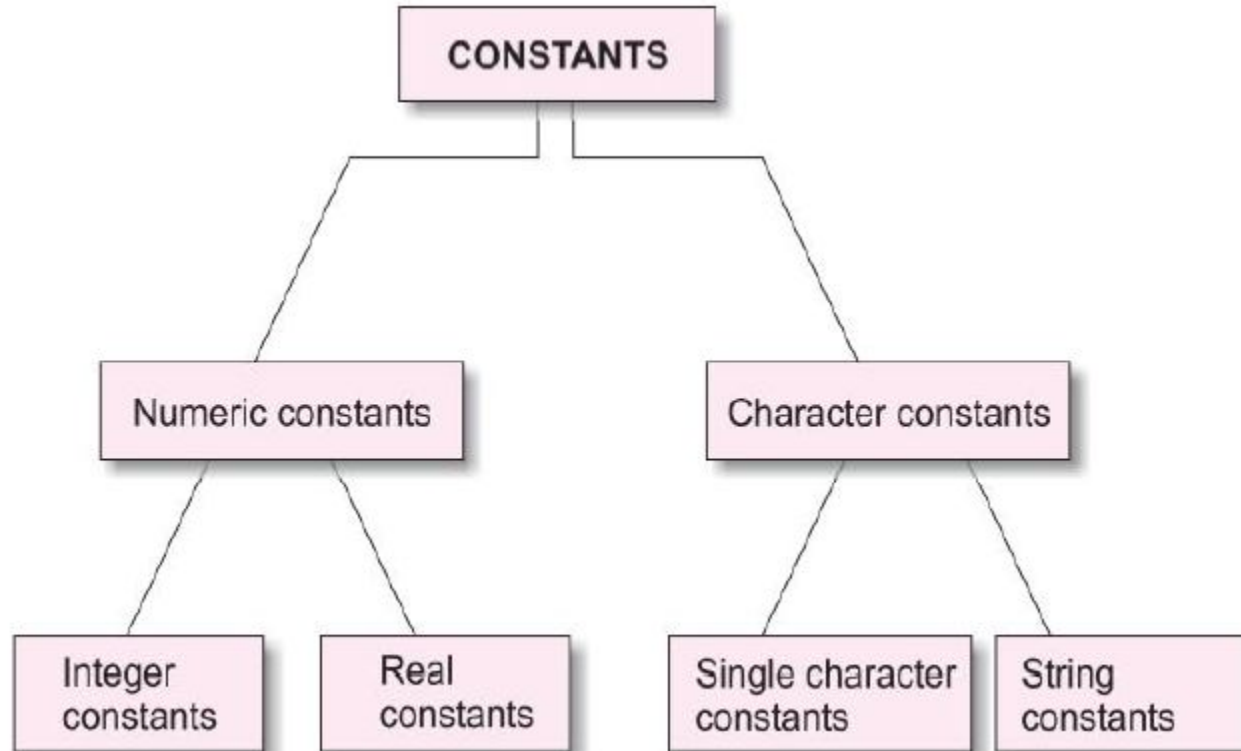
Size of Data Types

	32-bit	64-bit
char	1 byte	1 byte
int	2 bytes	4 bytes
float	4 bytes	4 bytes
double	8 bytes	8 bytes

Range

<i>Data type</i>	<i>Range of values</i>
char	–128 to 127
int	–32,768 to 32,767
float	3.4e–38 to 3.4e+e38
double	1.7e–308 to 1.7e+308

Constants



Constant

Use the keyword const

```
const int a = 5;
```

```
const char first = 'a';
```

```
const float pi = 3.14;
```

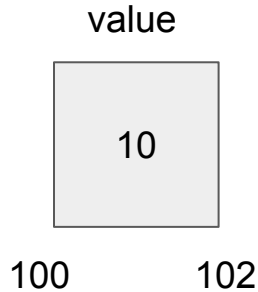
```
printf("Welcome to CSVTU")
```

String literal or constant

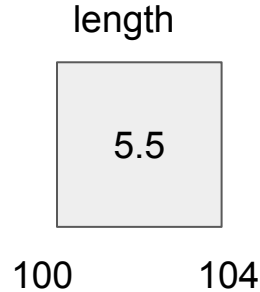
Variables

- A name associated with memory cells (boxes) that store data.
- Type of variable determines the size of box.
- Value can change during the program.

```
int value = 10;
```



```
float length = 5.5;
```



Variable Declaration

To communicate to compiler the names and types of the variables used by the program.

- Types tells size of the box to store value
- Variable must be declared before use
- Optionally, declaration can be combined with definition

```
int count;           // Declaration without initialization
```

```
int count = 0;       // Declaration with initialization
```

Identifiers

- Names given to different objects
 - variable, function etc.
- Consists of letters, digits, and underscore (_) symbol
 - must start with a letter or _
- Case Sensitive
 - count ≠ Count ≠ COUNT ≠ count
- i, count, max_profit, count5
- 5j, min-profit, lab.7

Reserved Words

Keywords in C Programming			
auto	break	case	char
const	continue	default	do
double	else	enum	extern
float	for	goto	if
int	long	register	return
short	signed	sizeof	static
struct	switch	typedef	union
unsigned	void	volatile	while

Choosing Identifiers

- Choose meaningful names
 - count vs c vs tmp1
- Should be easy to read and understand
 - count vs c_o_u_n_t
- Shorten only when no loss of meaning
 - Max vs Maximum
- Avoid unnecessary long names
 - a_loop_counter vs counter vs i

Assignment Statement

- A simple assignment statement
 - Variable = Expression;
- Computes the expression on the right hand side (RHS), and stores it in the variable on left hand side.
- = is known as assignment operator

Input/Output

I/O Functions

printf function is used to display results to the user (output)

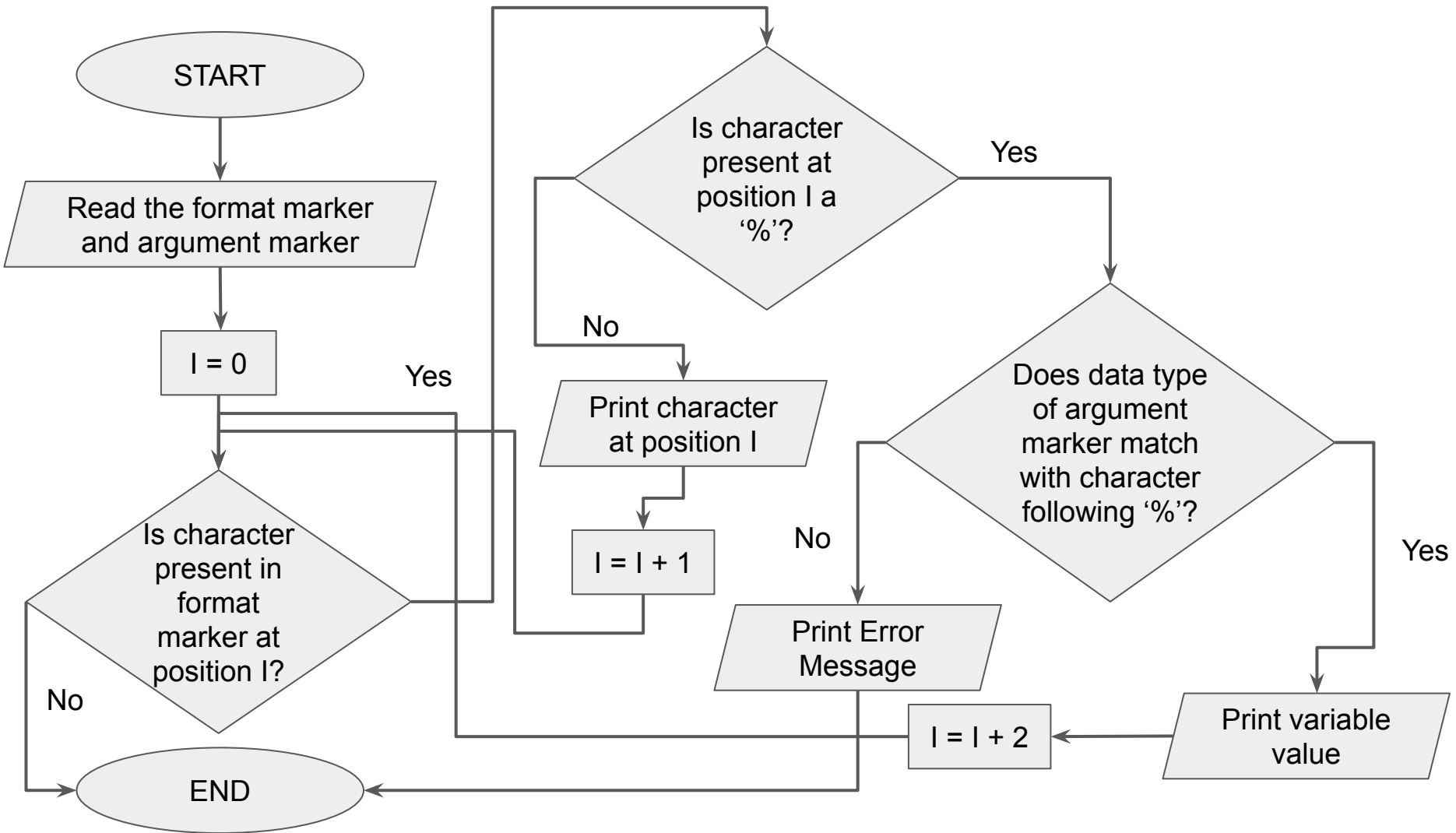
scanf function is used to read data from the user (input)

Printf function

```
printf("The sum of %d and %d is: %d", no1, no2, sum);
```



- The format marker is printed one character at a time till a % is encountered.
- If a % is encountered, then the argument marker is used one value at a time.
- The string terminates at ".



Flowchart for printf function

Can you draw the flowchart for printf function?

What all things you need to consider?

Thank You!!