Variables & Data types in 3 minutes

CHAPTER 15

SURESH TECHS

C PROGRAMMING COURSE

Variables

- Variables are **used to store the data** and it's value **can be changed at any time**

- Syntax:
  - type **variable**
  - type **variable1, variable2**

- Ex:
  - int **a;**
  - long int **la;**
  - float **b**;
  - char **c**;

```c
#include<stdio.h>
int main(){
    int a;
    int b;
    a = 10;
    b = 30;
    int sum = a+b;
    printf("%d\n",sum);
    a = 90;
    int sub = a-30;
    b = sub;
    printf("a = %d, b = %d",a,b);
    return 0;
}
```

Rules for defining Variables

- A variable can have **alphabets, digits, and underscore.**
- A variable name can start with the **alphabet, and underscore only**. It **can't start with a digit**.
- **No whitespace is allowed within the variable name**.
- A variable name **must not be a keyword**

Types of Variables

- **local** variable
- **global** variable
- **static** variable
- **automatic** variable
- **external** variable

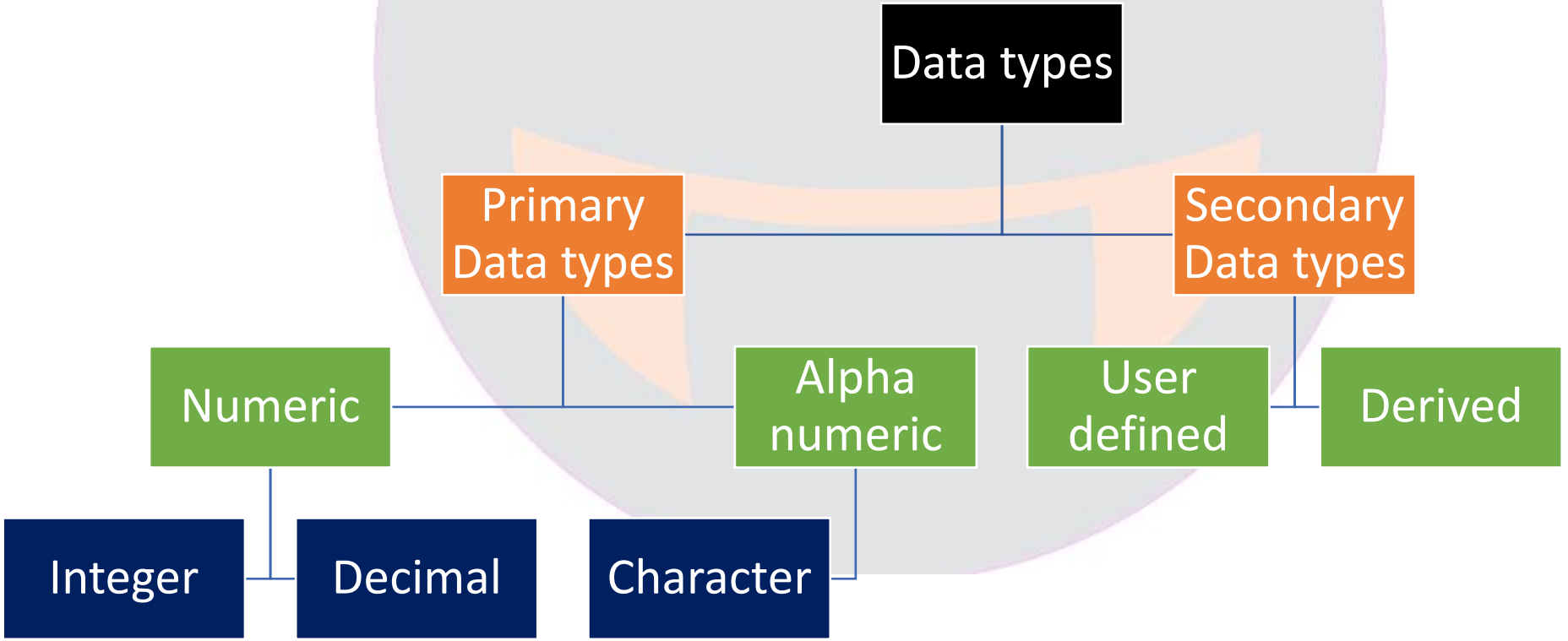
Will discuss in storage classes chapter

```c
#include<stdio.h>
void sum(int a, int b, int c){
    static int totalSum = 10;
    int sum = a+b+c;
    totalSum = totalSum + sum;
    printf("Total sum: %d\n",totalSum);
    extern int marks;
    printf("Marks: %d\n",marks);
}

int main(){
    auto int a = 10;
    register int b = 20;
    register int c = 40;
    sum(a,b,c);
    extern int marks;
    marks=300;
    sum(a,b,c);
    return 0;
}

int marks=200;
```

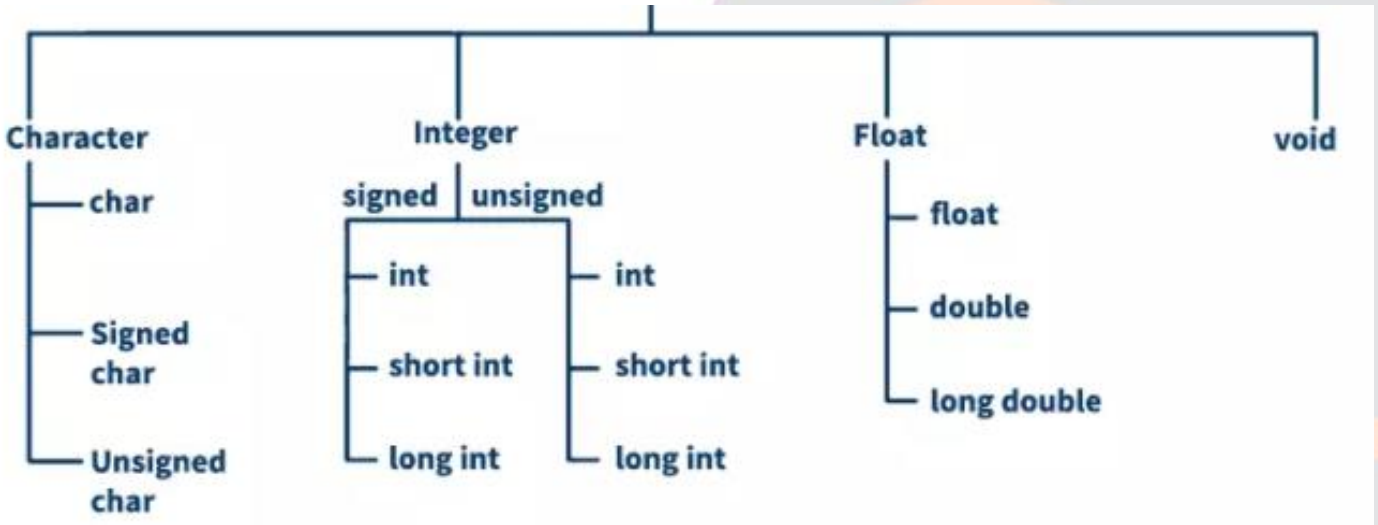
Data types

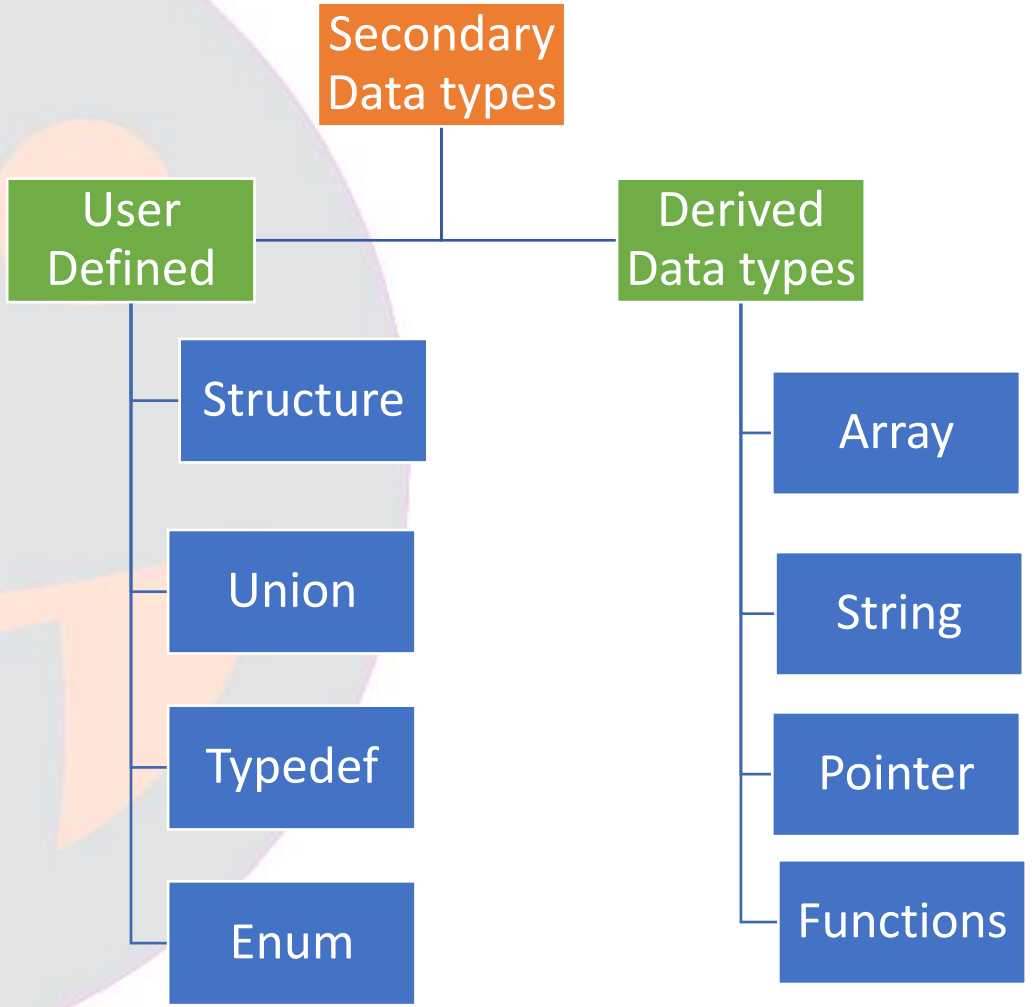
Data types

- A data type defines the **type of data** and **size of the data**



Primary / Basic data types





int data type

- It holds integers(**negative integers, zero and positive integers**).
- The keyword "**int**" is used to declare the integer data type and the format specifier is denoted by "**%d**".
- We can also use different type **modifiers** with this data type.
- They are **short, long, signed and unsigned**.

int data type

- The **short** keyword reduces the memory allocated to the **int** data type. The range, therefore, reduces accordingly.
- The **long** keyword increases the memory allocated to the **int** data type. The range increases accordingly.
- The **unsigned** keyword specifies that **only non-negative** integers can be stored inside the **int** data type.
- The **signed** keyword specifies that **all positive, negative and zero integers** can be stored.
- **Unless mentioned, the int data type is signed by default.**

float data type

- This data type holds **decimal** numbers.
- Decimal numbers are those which contain an **integer part** and a **fractional part** separated by a decimal point
- Ex: **19.23**, -9.21
- The keyword "**float**" is used to declare the **float data type**.
- The format specifier is denoted by "**%f**"

What happens when we store an integer in float variable

```c
#include<stdio.h>
int main(){
    float a = 10;
    printf("%f",a);
    return 0;
}
```

```
10.000000
```

```c
#include<stdio.h>
int main(){
    int a = 9.29;
    printf("%d",a);
    return 0;
}
```

```
9
```

double data type

- This is also used **to store decimal numbers**.
- The keyword "**double**" is used to declare the **double data type**
- The format specifier is denoted by “**%lf**”

double data type

- The **key difference** between the **float** and the **double** data type is the **number of digits each can store after the decimal point** and therefore the memory allocated to both of them is different.

- The **double** data type has **15** decimal digits of **precision** while the **float** data type has **6** decimal digits of **precision**

char data type

- It is used to store **single character values**
- Each **character has an ASCII value associated with it**. The keyword “**char**” is used to declare the char data type.
- The format specifier for this data type is "**%c**“

char data type

- We can also have **signed and unsigned type modifiers** for the char data type.

- The **signed** char data type has a range from **-127 to 128**.

- The **unsigned** data type has a range from **0 to 255**.

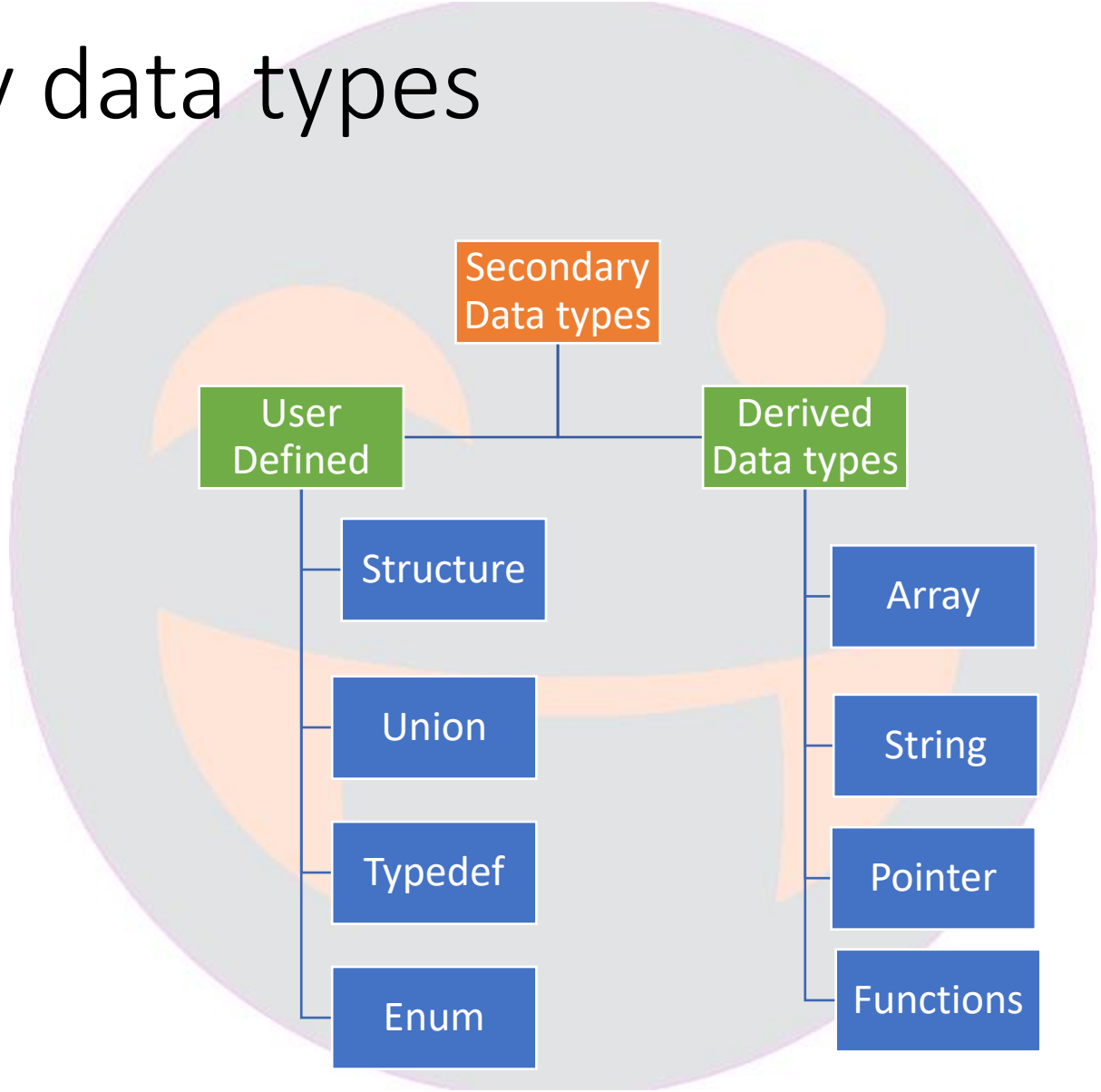
void

- It is **used if nothing is passed in the function or the function doesn't return anything**.

```
void printMe(int value)
{
    printf("%d",printMe);
}
```

```
int getData(void)
{
    return 2000;
}
```

Secondary data types



కొన్ని రోజులు (Research)

కొన్ని రోజుల తరువాత

Dennis Ritchie

1. 10 bores are not working – int bores = 10;

2. Pass percentage of school students are 30.26

3. Fight with king “SURBALI”

Let’s operate our kingdom

Father

నాన్న నాకు కుంచం సమయం ఇవ్వండి

SURBALI

C Grammar,

C Tokens,

Trigraph sequences,

Keywords,

Identifiers

etc