



Lab

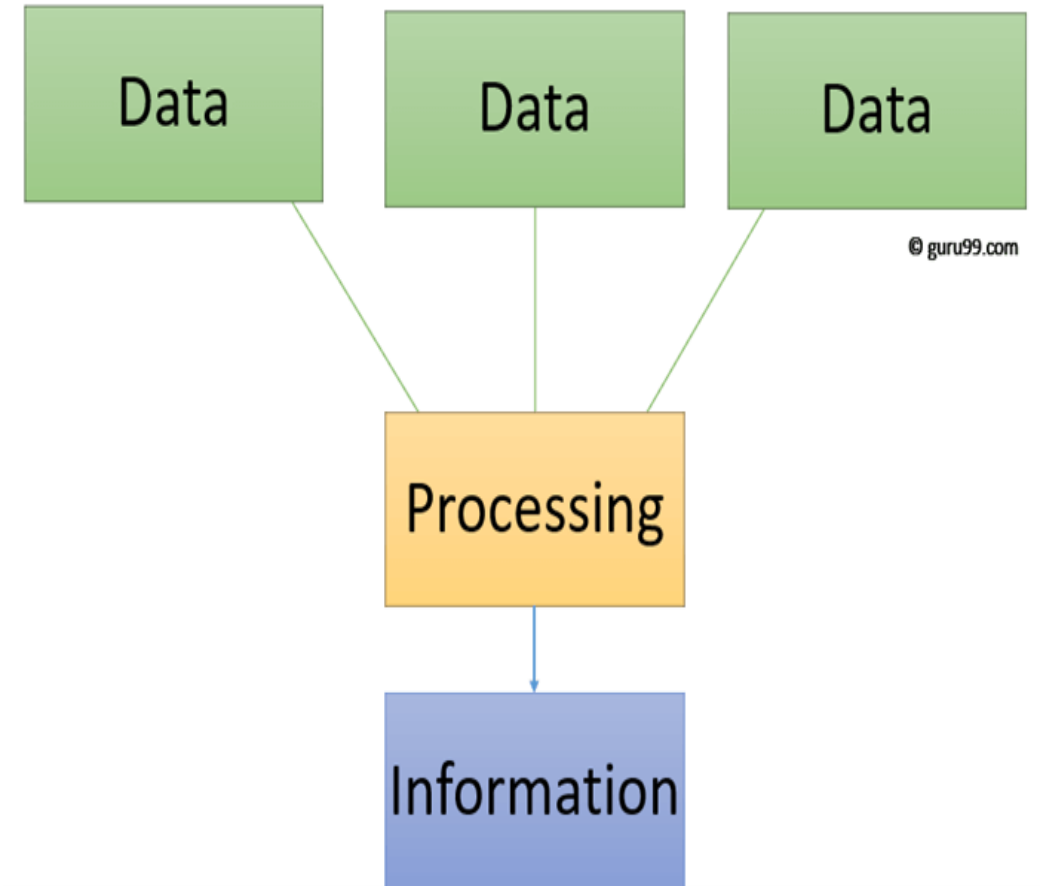
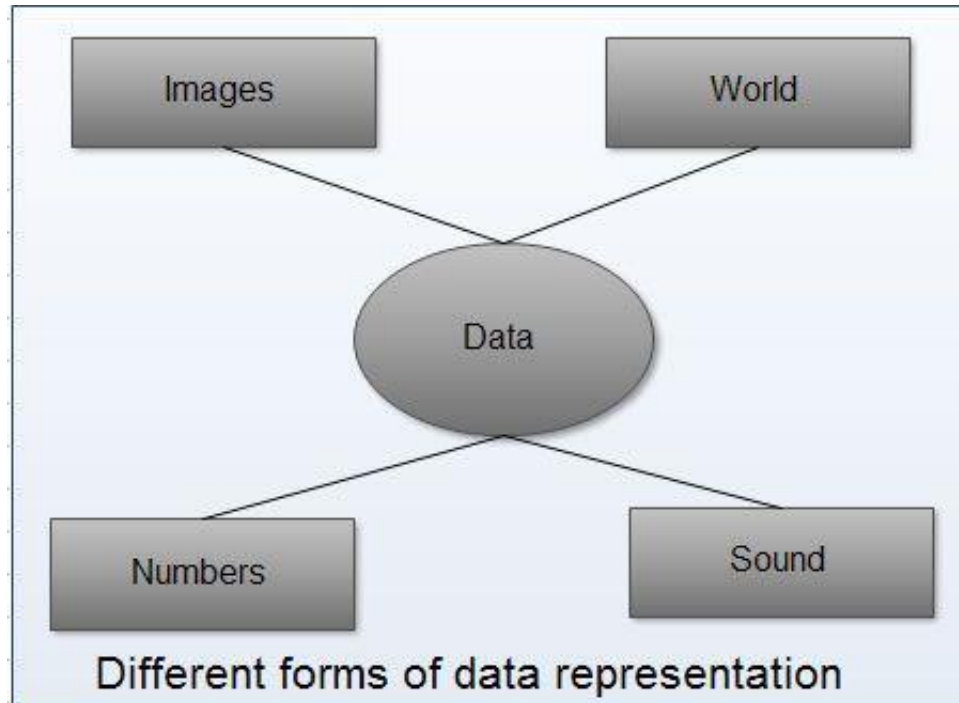
Principles of Programming Languages

Lab: Principles of Programming Languages

Exp-1

Type compatibility rules of a C compiler.

Data?



Data, Information, Knowledge, Wisdom

Data

- 100

Information

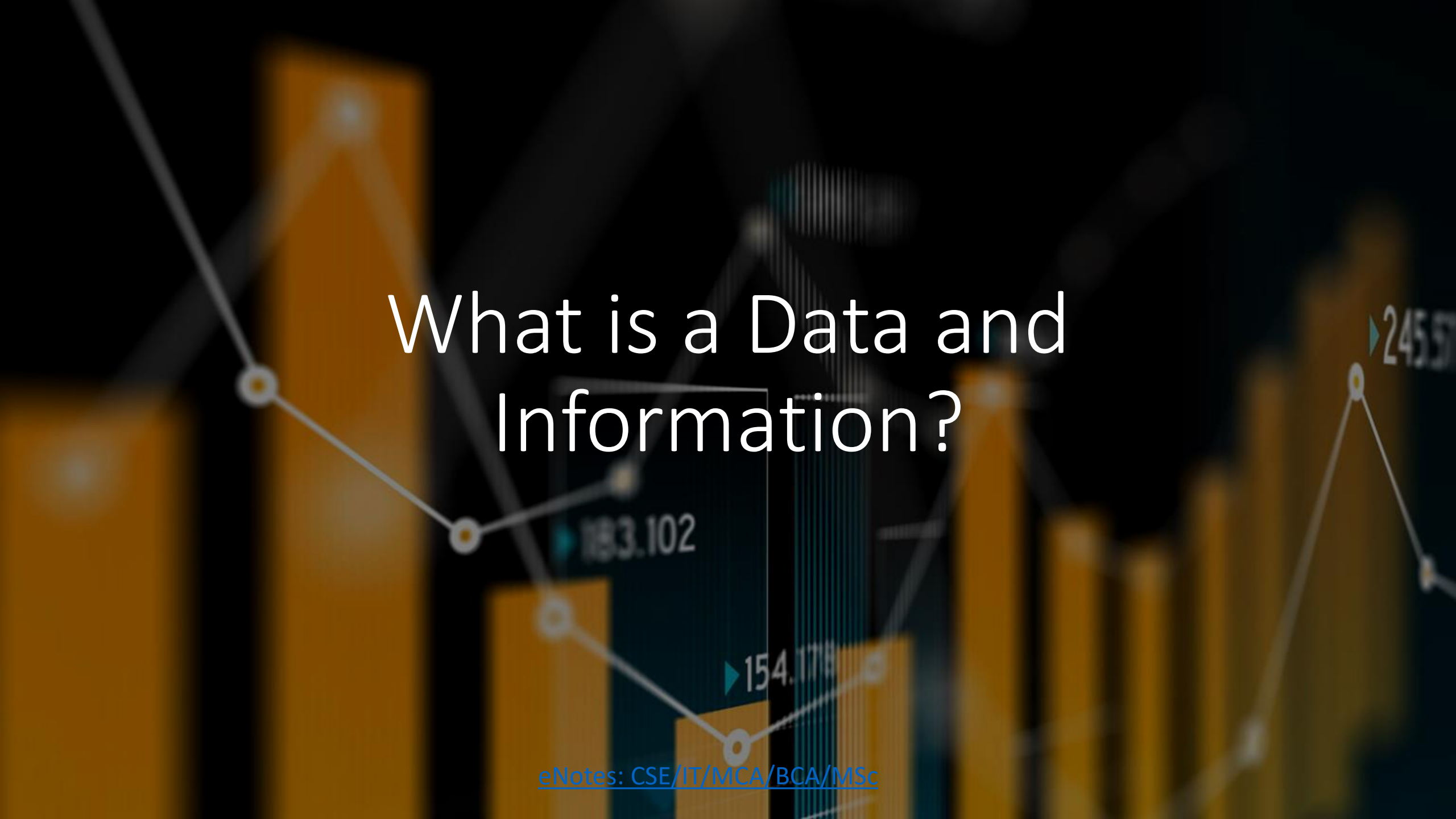
- 100 miles

Knowledge

- 100 miles is quite a far distance.

Wisdom

- It is very difficult to walk 100 miles by any person, but vehicle transport is okay

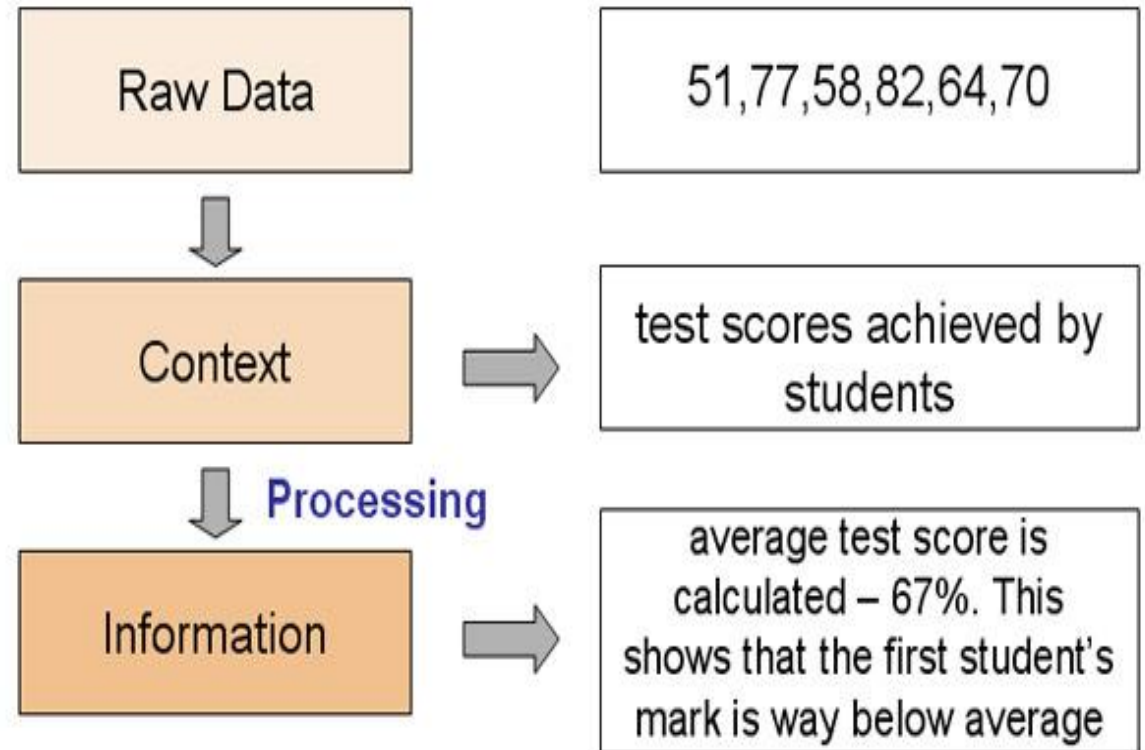
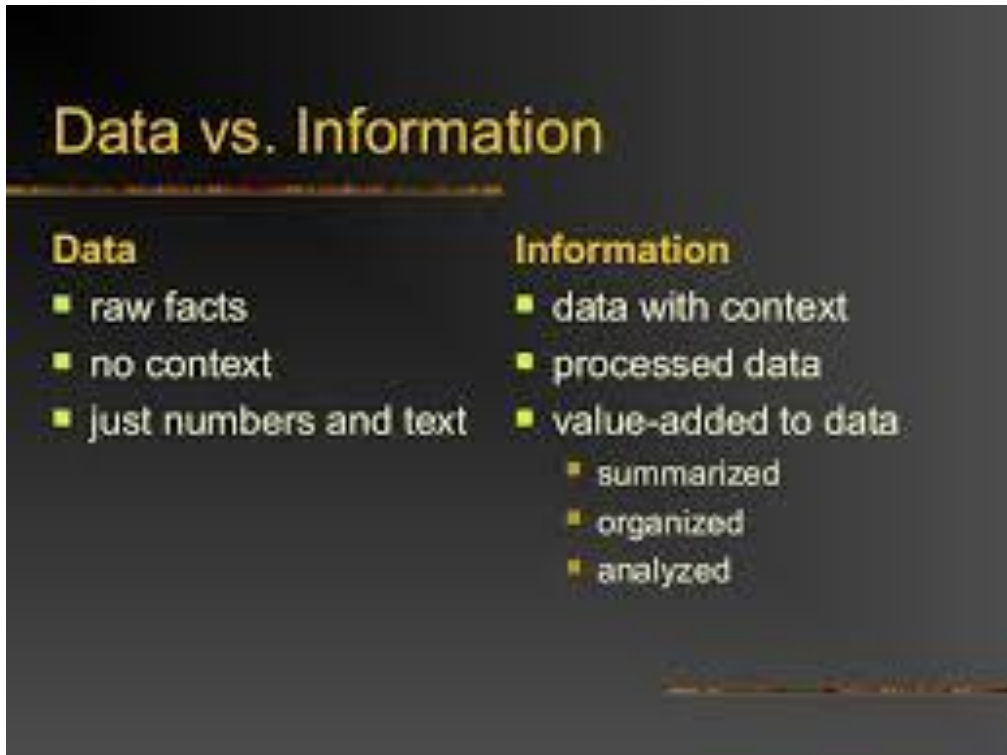


What is a Data and Information?

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- Data is an individual unit that contains raw materials which do not carry any specific meaning.
- Information is a group of data that collectively carries a logical meaning.
- **Data doesn't depend on information. ...**
- Information is measured in meaningful units like time, quantity, etc.

Example of Data and Information





Contd..

Common data types

Data type:	Example value:
------------	----------------

Integer	35462216
---------	----------

Floating-point	0.002756
----------------	----------

Char	H
------	---

String	Hello, World!
--------	---------------

Boolean	true
---------	------

ComputerHope.com

Student ID	First Name	Last Name	Credits completed	GPA
34933	Victoria	Slater	36	3.27
93759	Justin	McNeil	82	3.54
20847	Jessica	Bennett	56	2.87
65947	Michelle	Dolin	112	3.81
24956	David	Price	57	2.34
65692	Franklin	Mullins	13	3.72
24271	Alissa	Lee	77	2.96

Type Conversion in C

- The type conversion process in C is basically **converting one type of data type to other to perform some operation.**
- Type casting refers to **changing an variable of one data type into another.** The compiler will automatically change one type of data into another if it makes sense.
- For instance, if you assign an integer value to a floating-point variable, the compiler will convert the int to a float.

Types of type conversion

There are two types of type conversion:

- **Implicit Type Conversion**
- **Explicit Type Conversion**

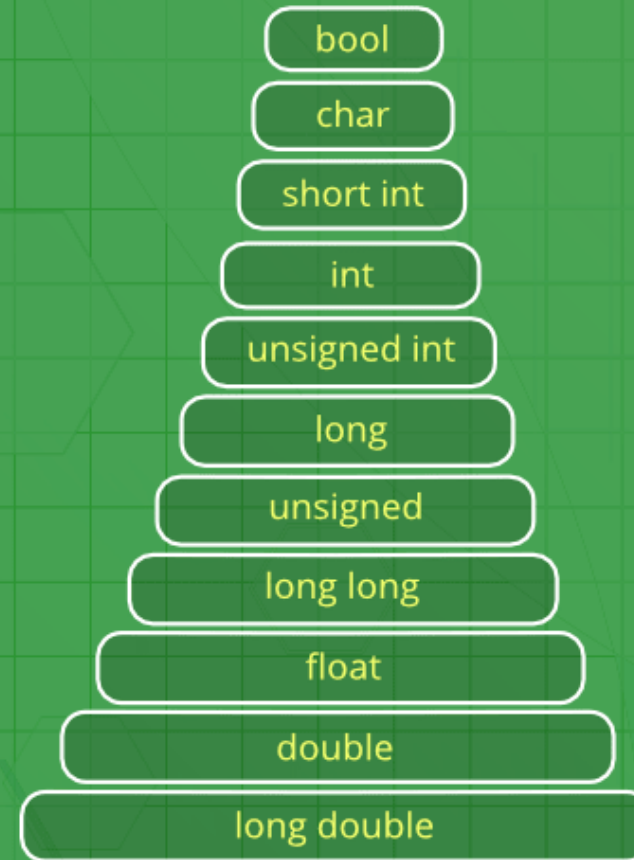
Implicit Type Conversion

Also known as 'automatic type conversion'.

- Done by the compiler on its own, without any external trigger from the user.
- Generally takes place when in an expression more than one data type is present. In such condition type conversion (type promotion) takes place to avoid loss of data.
- All the data types of the variables are upgraded to the data type of the variable with largest data type.

Contd..

Implicit Type Conversion



// An example of implicit conversion

```
#include<stdio.h>
```

```
int main()
```

```
{
```

```
    int x = 10;    // integer x
```

```
    char y = 'a'; // character c
```

```
    // y implicitly converted to int. ASCII
```

```
    // value of 'a' is 97
```

```
    x = x + y; //x=107
```

```
    // x is implicitly converted to float
```

```
    float z = x + 1.0; //107 + 1.0 => 107.0 + 1.0
```

```
    printf("x = %d, z = %f", x, z);
```

```
    return 0;
```

```
}
```

x = 107, z = 108.000000

Explicit Type Conversion

[eNotes: CSE/IT/MCA/BCA/MSc](#)

Explicit Type Conversion

Lower
Data type

Explicit Type
Conversion

Higher
Data type

Contd..

This process is also called type casting and it is user defined. Here the user can type cast the result to make it of a particular data type.

The syntax in C:

(type) expression

Output:

sum = 2

```
// C program to demonstrate explicit type casting
#include<stdio.h>
```

```
int main()
{
```

```
    double x = 1.2;
```

```
    // Explicit conversion from double to int
```

```
    int sum = (int)x + 1;
```

```
    printf("sum = %d", sum);
```

```
    return 0;
```

```
}
```

Advantages of Type Conversion

- This is done to take advantage of certain features of type hierarchies or type representations.
- It helps us to compute expressions containing variables of different data types.