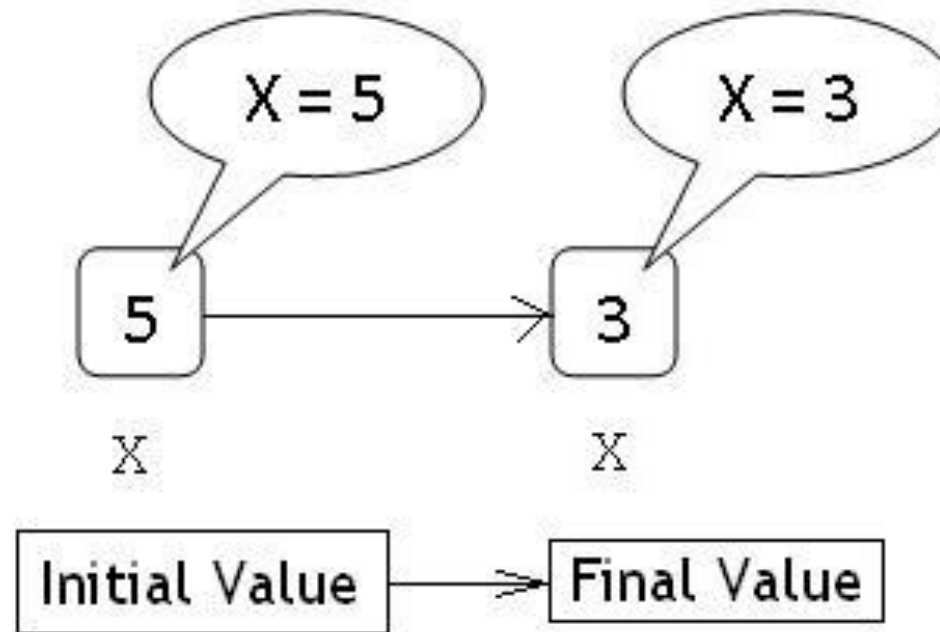# Variables, Data Types and Constants..

-Zubair uddin Shaikh

Variables

▶ A Variable is a name given to the memory location where the actual data is stored.

Variables...

▶ Memory **before** declaring (creating) a variable:

^	D	#	$	*
5	#	S	a	&
	!	%	,	D
1	A	%	Z	(
	1	Z	7	*

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This is memory before declaring variable. Each Square represents one byte of memory

Variables…

- Declaring variables in C….


```
char cvar;
```

^	D	#	$	*
5	#	S	a	&
	!	%	,	D
1	A	%	Z	(
	1	Z	7	*

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Randomly one byte is allocated for variable

Variables...

- Variable Initialization...

`cvar = 'A';`

^	D	#	$	*
5	#	S	a	&
	!	%	**A**	D
1	A	%	Z	(
	1	Z	7	*
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Variables…

Rules for variables:

1) A Variable name consists of any combination of alphabets, digits and underscores. Please avoid creating long variable name as it adds to your typing effort.

2) The first character of the variable name must either be alphabet or underscore. It should not start with the digit.

3) No commas and blanks are allowed in the variable name.

4) No special symbols other than underscore are allowed in the variable name.

5) We need to declare the type of the variable name before making use of that name in the program.

Variables...

▶ ***Variable attributes***

▶ Variable Name: **ivar**

▶ Variable Type: **Integer**

▶ Variable Address: **2000**

▶ Variable Size: **2 Bytes**

▶ Variable Value:**34**

```
int ivar;
```



```
34
```

2000

Variables

EXAMPLE:

#include <stdio.h>

int main()

{

    int number; // variable declaration

    number = 10; // variable initialization

    printf("The number is %d \n", number); // display the value stored in the variable

    return 0;

}

Comments

Keyword... Example

Example:

#include <stdio.h>

int main()

{

      int for; // variable declaration

      for = 10; // variable initialization

      printf("The number is %d \n", for); // display the value stored in the variable

      return 0;

}

keyword. c: 7:
Identifier Expected

Variable - Input...

```c
#include <stdio.h>

void main()
{
    int a,b, sum; // variable declaration

    printf ("ENTER VALUE FOR A :");
    scanf ("%d",&a);                    // Take first number as input
    printf("ENTER VALUE FOR B :");
    scanf("%d",&b);                     // Take second number as input
    sum=a+b;                            // Add the values

    printf("Sum Of Given Two Numbers is %d", sum); // display the result

}
```

Constant

- Constant means "**Whose value cannot be changed**"
- It can only be changed at the initialization point… and not during the program execution…

- Constant Declraration:

  - **const int**   a = 1;
  - **int   const**   a = 1;

Constant - Example…

```c
#include <stdio.h>

int main()
{
    const int x = 10; // constant declaration
    int y, sum;

    y = 20;
    x = x+1; // changing the value of constant
    sum = x + y;

    printf("The sum is %d \n", sum);

    return 0;
}
```

Error!!!

Data Types

- Think of Items of different shapes and size…

Data Types...

- Square

  shaped items

- Examples...

Data Types...

- Round/Cylinder
  shaped items

- Examples...

Data Types...
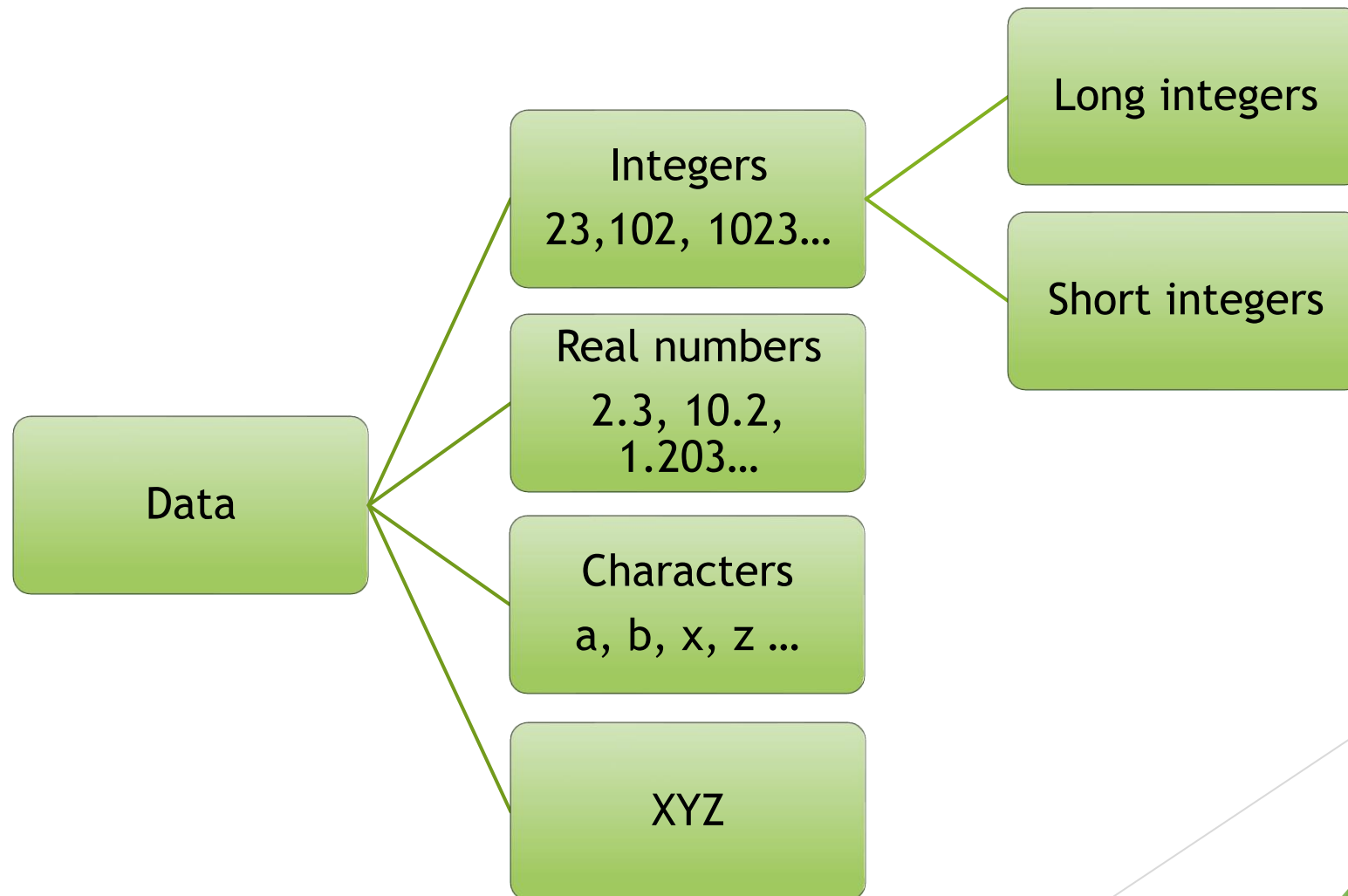
- Triangle shaped items

- Examples...

Data Types...

- Each shape corresponds to a different TYPE.

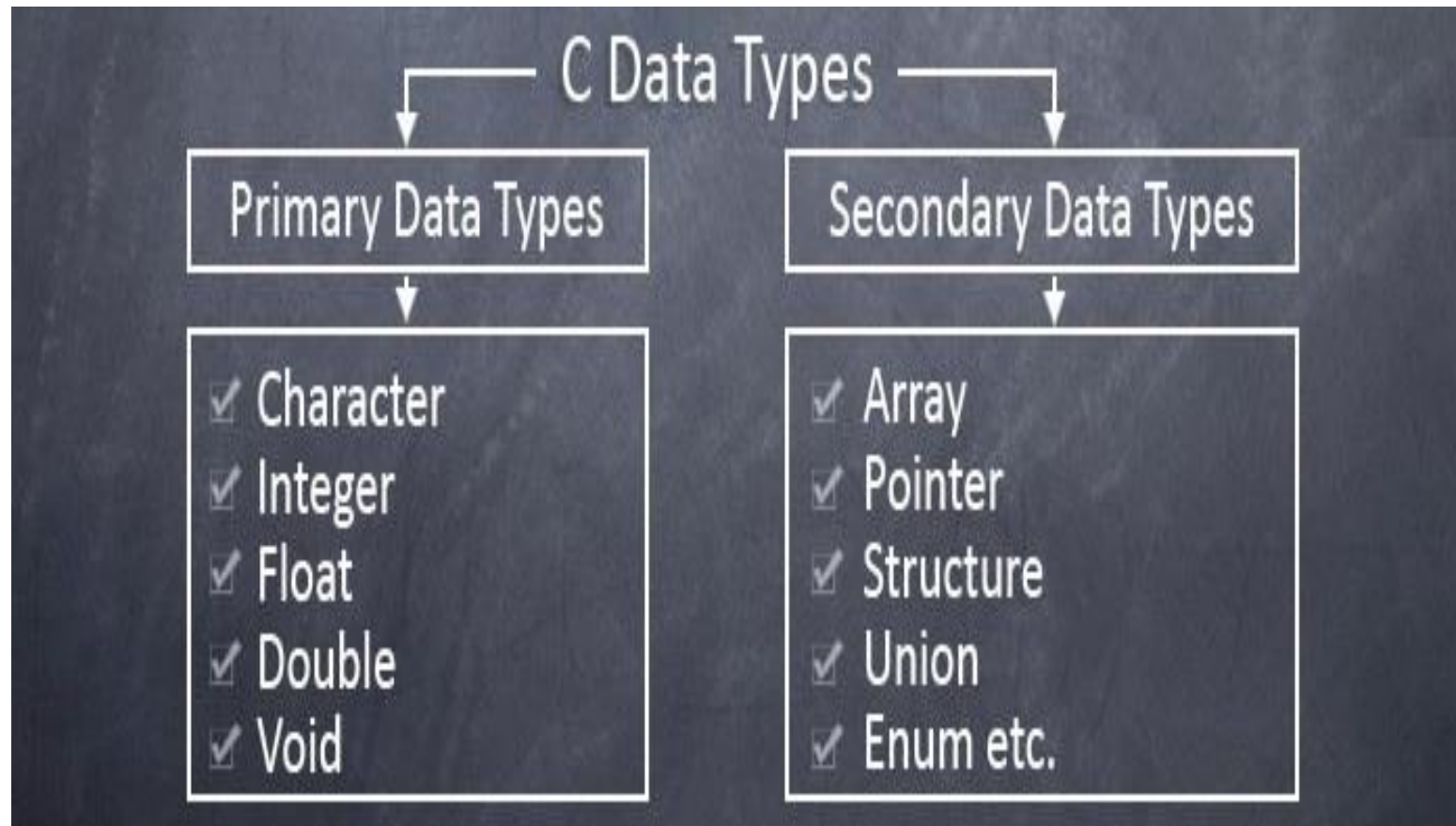- ## Some Examples (Items/Containers) from Students…..

Data Types...

- Hangers for Curtain roads, rails and wires..
    - For rings … rods
    - For clips… wires
    - For hooks...rails
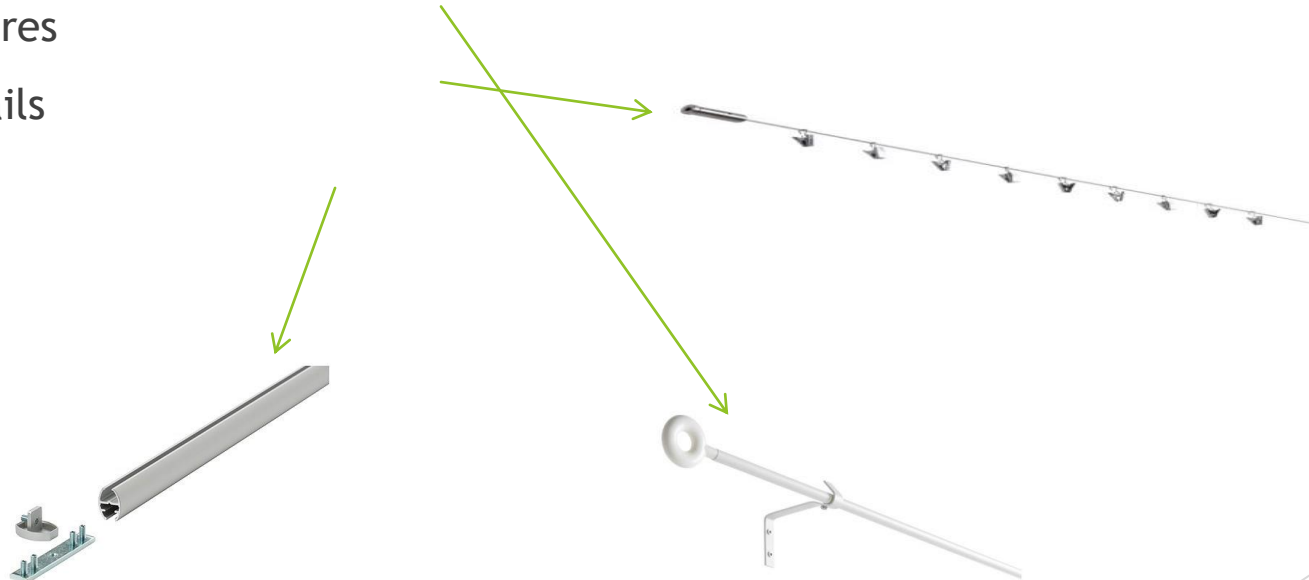
Data Types…

Data Types in C...

Data Types in C...

DATA TYPE	SIZE (IN BYTE)
char	1
short int	2
int	4
long int	4
float	4
double	8
long double	12
void	MEANING LESS

Data Types in C...
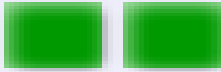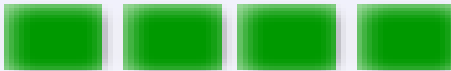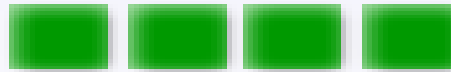
Float Example

```c
#include <stdio.h>

// Program for calculating the circumference of the circle..

int main()

{
        const float pi = 3.14; // constant declaration

        int radius = 0; // variable declaration

        float circumf = 0;


        printf("Please enter the radius of the circle:\n"); // ask for radius

        scanf("%d",&radius);


        circumf = pi * radius;


        printf("The circumference is: %f", circumf);


        return 0;

}
```

Char Example

```c
#include <stdio.h>

// Program for testing char input..

int main()
{
    char input;

    printf("Do you want to enter a number? Press y or n:\n"); // ask for input
    scanf("%c", &input);
    //input = getchar();

    printf("The answer is: %c", input);

    return 0;
}
```

● ● ● ● ● ● ●

- Two bytes meet. The first byte asks, "Are you ill?"

- The second byte replies, "No, just feeling a bit off."