

ED1021 - Introduction to computation and visualisation

L4 - Programming basics - Variables

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Course web page: <https://ed.iitm.ac.in/~raman/introcomp.html>

Moodle page: Available at <https://courses.iitm.ac.in/>

Variables (Scalar variables)

Recap

- We saw about `constants` last time.

Variables

- Can vary during the execution of the program
- Each variable has a specific storage location in memory.
- It's like a 'name_tag' for the location
- Variables are used to store constants.
- A variable can take another constant during the program (that's why it is called as 'variable').

Variable

Syntax

- Always starts with a `letter`
- Can have also numbers.
- Underscore can be used.
- Examples: fahrenheit, theta, centi123, abc, ABC (Note that small case and caps are considered different variable names).
- Qn: Give some examples for what is NOT a variable?

Variable (also called Identifiers)

integer and floating point variables

- integer variable can only store integer constant.
- floating variable can only store floating point constant.

Variable

integer and floating point variable declaration

- All variables in a program have to be declared before using in the program.
- integer variables are declared using the keyword 'int'.
- Example - int number; (number is the name of a variable that can only take integer constants).
- floating point variables are declared using the keyword 'float'.
- float num; (num is the name of a variable that can only take floating point constants).

Variable

Valid and invalid declarations

- Syntax - typename var1, var2, var3;

A Sample Program

Example program for adding two integer numbers

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

```
int main() {  
    int a, b, c; // a, b, c are called variables  
    a = 2;  
    b = 3;  
    c = a + b;  
    printf("c = %d\n", c);  
    return 0;  
}
```


A Sample Program

Example program for adding two floating point numbers

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

```
int main() {  
    float a, b, c; // a, b, c are called variables  
    a = 2.2;  
    b = 3.55;  
    c = a + b;  
    printf("c = %f\n", c);  
    return 0;  
}
```

‘C’

- ‘C’ requires `Syntax’ (rules)
- C is Syntax heavy (Each and everything that you write has to follow certain rules).

Defining Constants

not same as numeric constants

- Value to a variable while declaring it.
- E.g.: `int a = 5;`
- E.g.: `float b = 4.56;`
- Another way is to use `#define` (which I will discuss later)

A Sample Program

Example program for defining constants

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

```
int main() {  
    int a = 2, b = 3, c;  
    c = a + b;  
    printf("c = %d\n", c);  
    return 0;  
}
```

Other types of declarations

Find out more details about the following

- short int
- long int
- double
- char
- unsigned int
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