Welcome to CS0.101 Computer Programming

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Admin Stuff

Teaching Team

Instructors: Girish Varma

Head TA: Sajjid Ansari

TAs:

How to ace this course?

12 Weeks Course (excluding exam/holiday/prep weeks)

Session	Time (hrs)	Marks (%)
2 Lectures	2 x 1.5	-
1 Tutorial	1 x 1	-
1 Lab	1 x 3	1.0
Reading/Practice	3	
Assignment	3	2.0

Total Time per week: 13 hrs

Total Problem solving per week: 3 (Lab) + 2 (Tut) + 2 (Assgn) + 2 (Practice) = 9

Evaluation

Component	Marks (%)	
Lab	10 x 1	
Assignments	7 x 2	
Quiz	8 x 2	
Mid Term	10 + 15	Written + Lab
End Sem	15 + 20	Written + Lab

Solve 100 problems over the entire course.

Websites

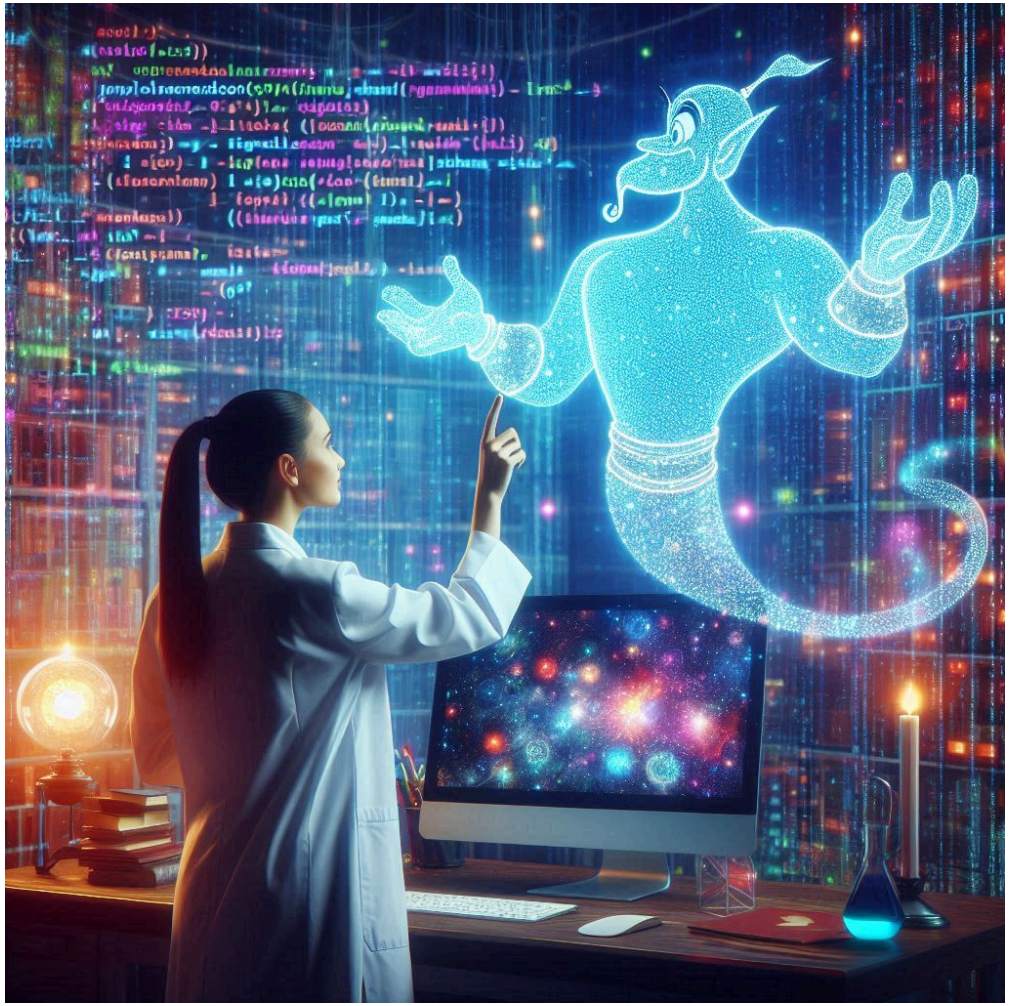
Course Website: https://cpro-iiit.github.io/

All lecture/lab/tutorial material is posted. Additional information, links to other courses/tutorials on the web.

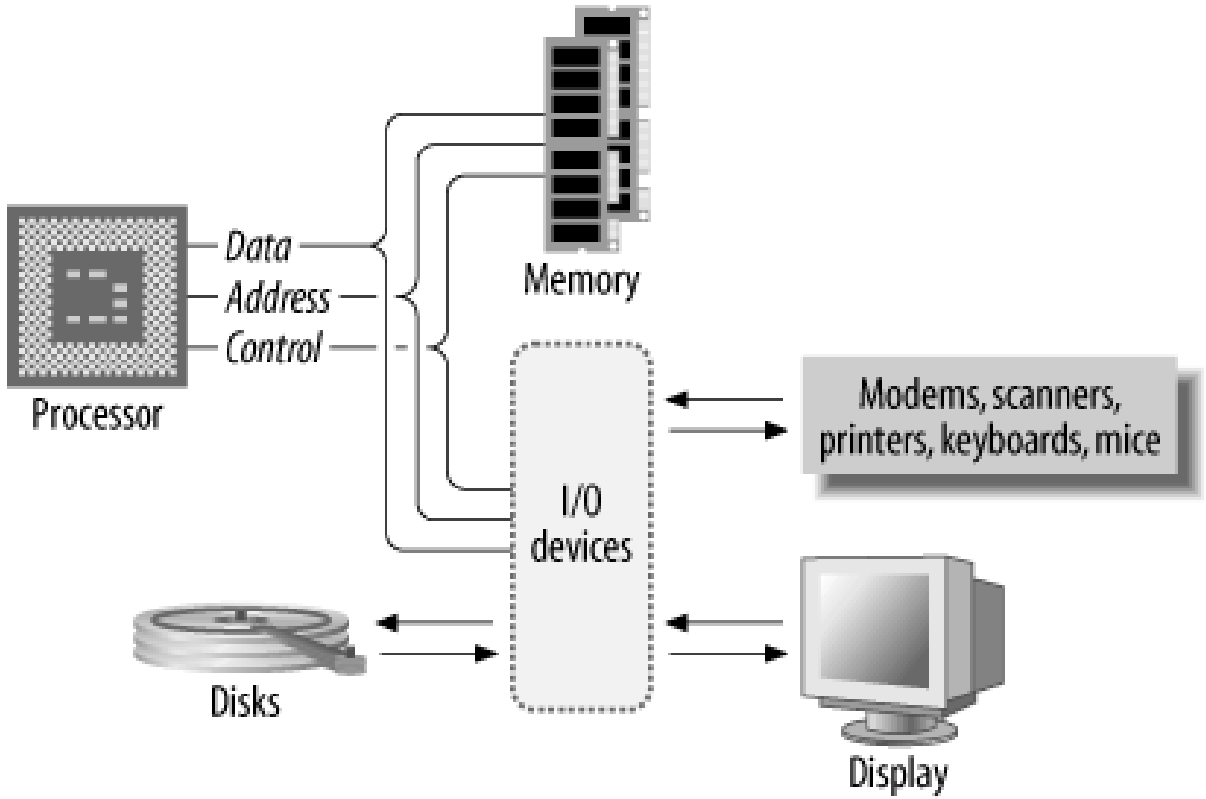
Introduction to Computer Programming

What this Course is about?

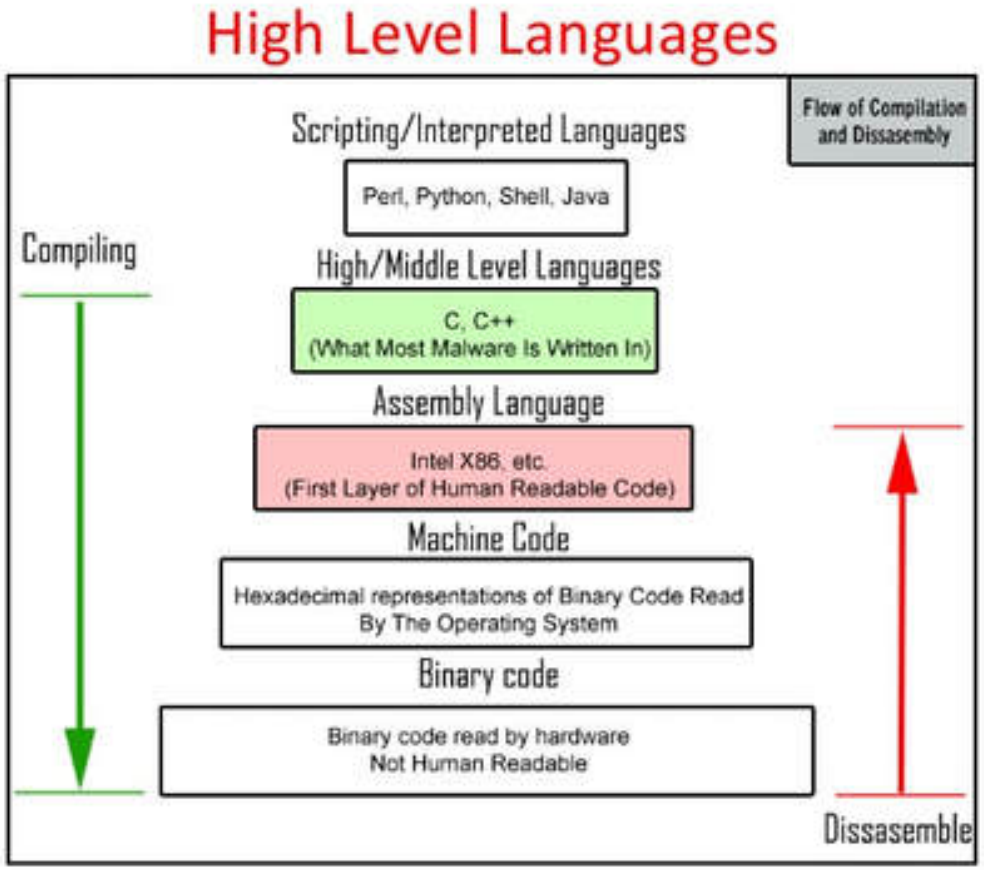
- Genie needs to be instructed precisely, otherwise it will not respond!
- It will precisely do, what you told it to do! If you meant something else and that was your problem.
- Genie only understand a language, which has no scope for confusion/ambiguity.



Basic Computer Organisation



Programming Languages



Intro to C Programming

Hello World! C Program

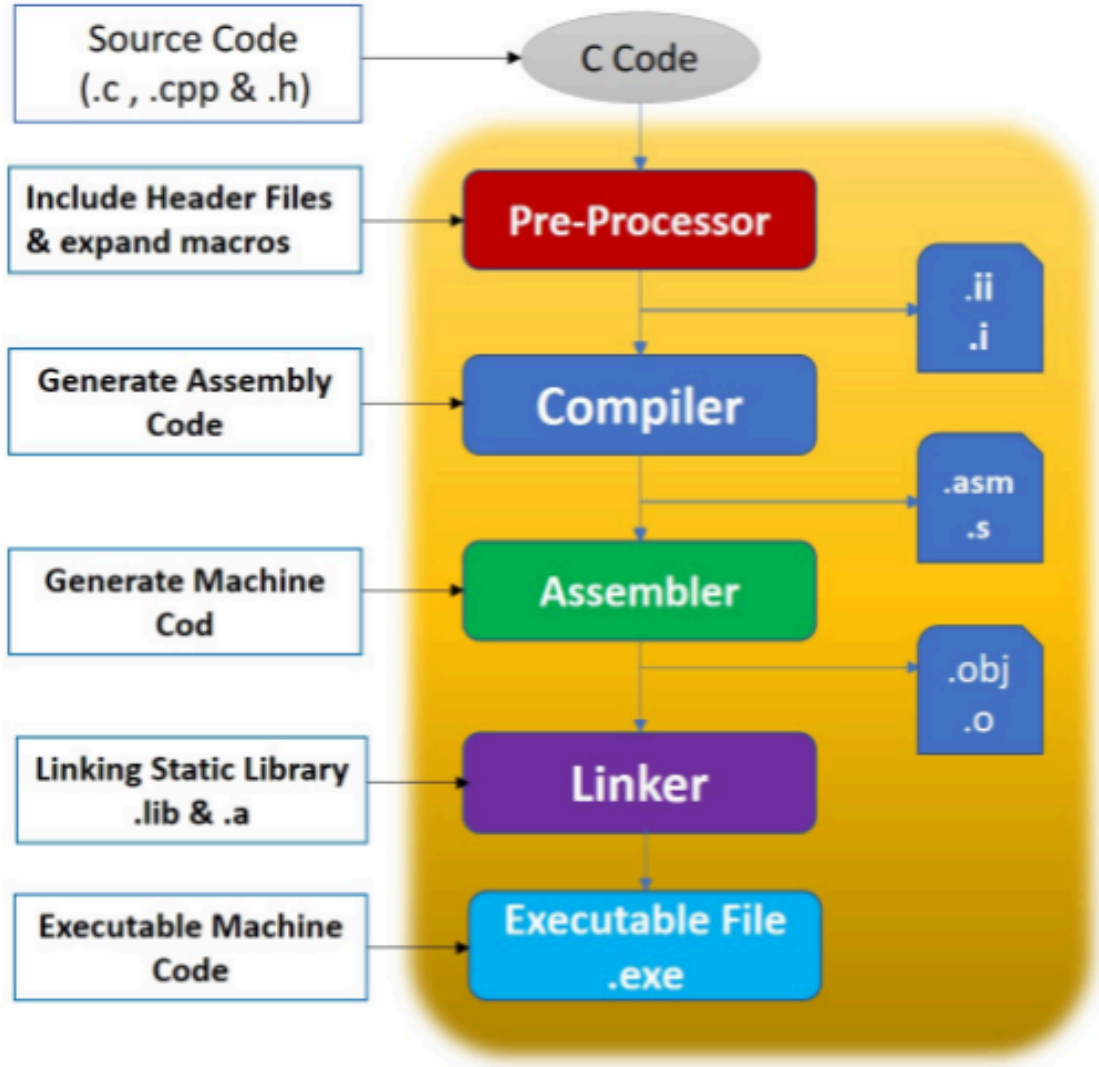
`main.c` file. Try it out at https://www.programiz.com/c-programming/online-compiler/

```c
// 1. This line is a comment that is ignored by compiler.

// 2. include standard library for input/output. Allows to print to shell
#include <stdio.h>

// 3. execution start inside this **function** named main.
int main()
{ // start of main function

    // 4. prints to the shell
    printf("Hello, world\n");
    return 0; /* 5. returns integer 0 */

} // end of main function
```

Running the Program

1. Run gcc compiler to get executable file `main`
   ```
   gcc main.c -o main
   ```
2. Run the executable `main`
   ```
   ./main
   ```

What just happened?



Using Makefile to do it together

1. Create a file `Makefile` (one time step)

```
// Makefile
run:
    gcc main.c -o main
    ./main
```

2. run `make run`

Next time, after you modify `main.c`, only `make run` needs to be done.

Constants, Datatypes, Expressions

Constants

```c
#include <stdio.h>
int main()
{
    printf("printing the integer constant %d\n", 1);
    printf("printing the integer constant %d\n", 100);

    printf("printing the float constant %f\n", 1.5);
    printf("printing the float constant %f\n", 15.6);

    return 0;
}
```

Try out code online:

https://www.programiz.com/online-compiler/7vCJDbICMawSj

Data Types

Type	C Type	Memory
Integer	int	32 bits
Real Number	float	32 bits
Character	char	8 bits

Expressions

```
printf("circumference is %f", 2*3.14*5);
```

Try out code online:

https://www.programiz.com/online-compiler/7vCJDblCMawSj

Comments for C:

- Whole-line comment
- Partial line comment
- Multiple line comment

```
// This is a whole-line comment
variable = 5; // this is partial line comment
/* and
comment
comment
..
*/
```

- Programiz, web editor: https://tinyurl.com/bdd55vwn

Identifiers:

- Unique names that are assigned to variables, structs, functions, and other entities.
- Allow us to name data and other objects in the program.
- Each identifier object in the computer is stored at a unique address.

Rules to create identifiers:

- First character must be alphabetical or underscore '_'
- Must contain only alphabetical characters, digits, or underscore
- The first 63 characters of an identifier are sufficient
- Can not duplicate a keyword

E.g. for identifiers

```
a                   // valid
my_name             // valid
_your_name_         // valid
_Bool               // valid
_bool               // valid but not same as _Bool
Student Name        // invalid
int                 // not valid, int is a keyword
char                // not valid, char is a keyword
2_name              // invalid, starting with digit
I_am-Yoda           // invalid, '-' not allowed
```

Constants:

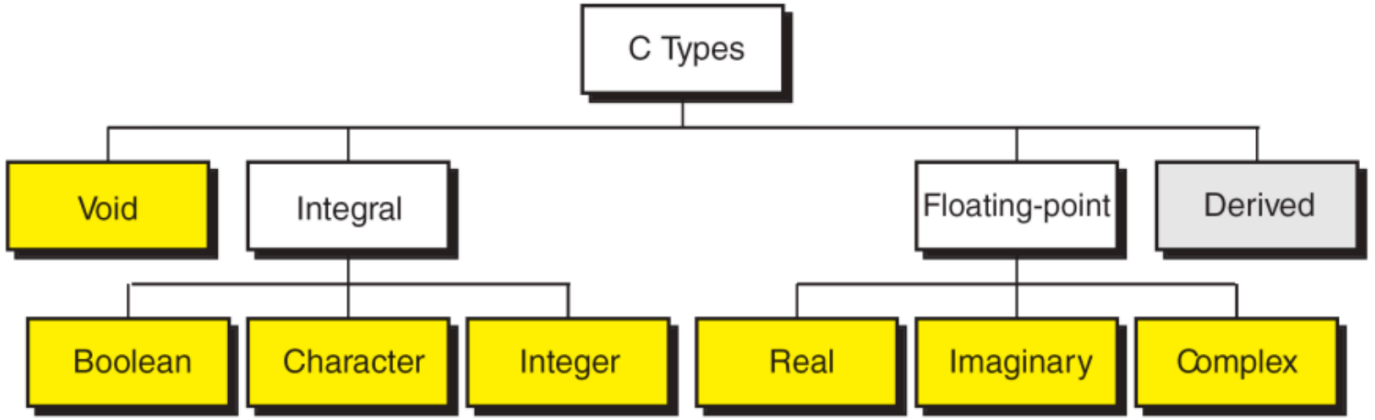
Constants are data values that can not be changed during the execution of a program. Like variables, constants have a type.

Constant types:

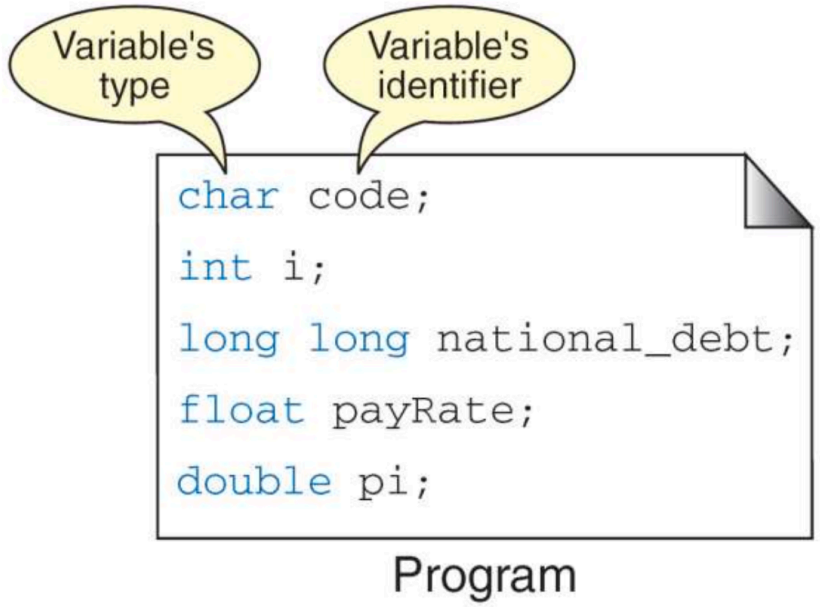
- **Boolean, character, integer, real, complex, and string constants.**

Variables:

```
Void, Character, Integer
```



Variable Initialization:




```
bool   fact;
short  maxItems;              // Word separator: Capital
long   long national_debt;    // Word separator: underscore
float  payRate;               // Word separator: Capital
double tax;
float  complex voltage;
char   code, kind;            // Poor style—see text
int    a, b;                  // Poor style—see text
```

Reading

Chapter 1 upto Section 1.4,

Chapter 2 upto Section 2.2

Computer Science: A Structured Programming Approach Using C

Behrouz A. Forouzan, Richard F. Gilberg

Chapter 2

Computer Science: A Structured Programming Approach Using C

Behrouz A. Forouzan, Richard F. Gilberg

Fundas for doing Programming!

Tresure Hunt/Dumb charades!

- Dont be afraid to make guesses!
- Dont be afraid to try out guesses!
- Failed guess gives clues. Learn from them!
- You will eventually learn to make more clever guesses.

Thanks