Writing a simple program

Discussion

- How do you write an essay/article/blogpost?
- Why is structure important?
- What is the core idea behind deciding a structure?

What does a C program looks like

- Starts with comments

  /*

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  *Author abc

  */

- Then include statements

  #include <stdio.h>

- Finally the program code

  int main(void) {}

Understanding a simple code

```c
/*Author Rishabh
Program to add two numbers*/
#include <stdio.h>
int main()
{
        int p,r;
        printf("enter values of p and r");
        scanf("%d %d", &p, &r);
        int total=p+r;
        printf("%d",total);
        return 0;
}
```

Build Process

- Preprocessing
- Compiling
- Assembling
- Linking
- Executing

Format specifier

- %c character
- %d integer
- %i integer
- %f floating point
- %e exponential
- %x hexadecimal
- %o octal
- %s string
- %p address

Data Types

- ## System defined
  - Integer
  - Float
  - Character
  - String

- ## Derived
  - Array
  - Pointer

- ## User defined
  - Structure
  - Union
  - Enum

Storage Classes

- Automatic
- Register
- Static
- Extern

They define

- – Storage location
- – Default initial value
- – Scope
- – Life

Memory Layout

- Code segment

- Stack Segment

- Heap

- Data segment
  - Initialized data
  - Uninitialized data

Points to remember

- Comments
- Include statements
- Main and other functions
- Return type
- ';'
- Arithmetic operators
- Data types
- Input and Output statements
- '&'

Summary

- The three primary constants and variable types in C are integer, float and character.

- A variable name can be of maximum 31 characters.

- Do not use a keyword as a variable name.

- An expression may contain any sequence of constants, variables and operators.

- Operators having equal precedence are evaluated using associativity.

- Input/output in C can be achieved using **scanf( )** and **printf( )** functions.

Questions

- What is scope of a variable? What are the different scopes?

- Difference between declaration and definition?

- What is extern int j? declaration or definition

- Output?

```
main()
{
 extern int i;
 i=20;
 printf("%d",sizeof(i));
}
```

- Is this correct C statement?

Float a=3.14; a=a%3;

- What is the storage class of i in this?

int i;

- Can I and j be used in other files?

auto int i;

static int j;

- What will be the values in int I; float j; if they are declared in main/ outside main?

Answers

- Scope indicates region where variables declaration has effect. Kinds of scope are file, function, block and prototype

- In Definition space is reserved and some initial value is given to it whereas declaration only identifies the nature or type of variable.

- It's a declaration

- Compile time error: Undefined I

- Float and double cannot be divided directly. We use special library methods to perform arithmetic operations on them.

- Auto if declared in main and extern if declared outside

- Variable I can be used provided it is declared as extern int i in any other file and j being static cannot be used.

- Inside main auto so garbage outside extern so 0 and 0.0

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