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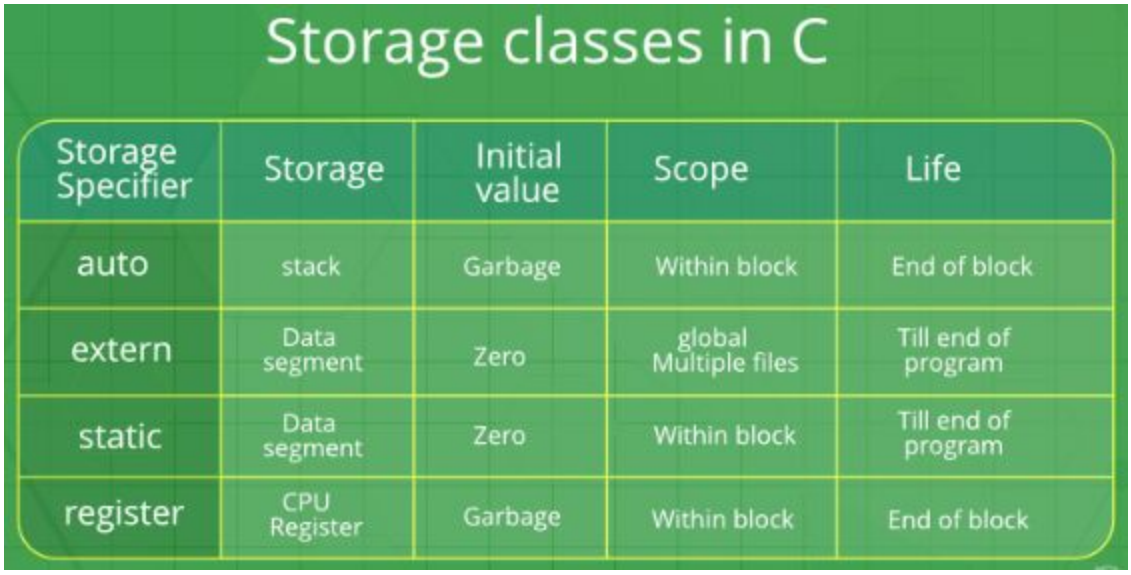
Core and Crux for Basic Programming in C and C++

- We can **create a body** without **any function**, without any **if-else statement** and or without any **class** by using **{ }**, and this set of braces has its scope of variables.
- The range of unsigned short int is from 0 to 65535, if i=65536 on-increment it will become zero and after another increment, it will be 1 and so on forth.
- **Unary**, **Conditional**, **Exponent,** and **Assignment** operators have the **right to left** associativity. I.e. (the rightmost term will be evaluated first).
- Int a=(2,3,4), braces consider only the last value and skip the all. So here a=4.
- **Comma operator** will consider only the first value and skip the all, e.g. int a=2,3,4,5; here a=2.
- **Braces have the highest precedence**.
- Increment, Decrement Operators may or may not change their value in memory while evaluating with the logical operators, e.g. (**0&&z++** and **1||z++**) here z won't increment because here compiler need not check z while (**1&&z++** and **0||z++**) here compiler depends on the value of z, also **Logical Operators won't check the other terms if it is not necessary to check them**.
- **Modulo operator works only on integer values**. (8.8%2 is not allowed)
- sizeof(pointer) is 4 bytes for modern OS and it is the same for all data types.
- int p:3; means here p can store only three bits of a number. **Colon restricts p to store only 3 bits**.
- **In an array x[5] can also be written as 5[x] and (x+5)[3] means x[8].**
- When a character array contains its first symbol as a **null character** then the whole string will be null.
- Consider **%c** as a character, **%d** as decimal, **%s** as a string, **%f** as float, **%lf** as double, **%o** as octal, and **%x** as hexadecimal in **printf()** and **scanf()** function as a **format specifier**.
- float i=0.2; here if(i==0.2){...} won't execute whereas if we assign float i=1.25 then if(i==1.25){...} will execute. Float takes terminating values(values which will terminate after multiplying by 2^n) as true assignment.
- In **printf()** and **scanf()** functions there must be a format specifier for each variable. (If there are less fewer format specifiers then compilers consider first for first, second for second respectively and skip the last variables without printing and scanning them.)
- **Assignment of a printf() and scanf() function to a variable is assigned as the number of symbols in the string.** I.e. c=printf("rohit"); here c=5; and c=printf("%d",78); here c =2 and c=printf("\n%d",56); here c=3.(\n will also be included).
- printf(3+"ohhsenorita"); print senorita.
- Any value with **0x** prefix is in hexadecimal notation ie. 0x10 (10 of hexadecimal is equal to 16 in decimal).
- Any value with **0** prefixes is in octal notation ie. 010 (10 of octal is equal to 8 in decimal).

- **sizeof(x)** means the size of the data type(if the data type is a string then we include the spaces and if the data type is char array then we include the null character too).
- In **sizeof()** operator increment and decrement operator won't work. sizeof(++a) will not increment the value of a.
- **strlen()** function is used to find the length of the string.
- The **size of a union** is the **maximum size of a single variable** of the variables it contains while in the structure data type the size is the total size of its variables.
- **Static variables** can be **initialized only once** and must be **initialized by a constant**, not a variable and static variables hold their value in the entire code. But it can be assigned a new value every time explicitly.
- The default value of static int is zero(0), garbage otherwise.
- **Exit:** quit a program, **Break:** quit the block, **Continue:** skip the current iteration, **Return**: quit and return the value to a function.
- **'Continue'** keyword in the switch case will give an error.
- In the switch case, there can't be two same cases, it will throw a duplicate case error. (97 and char a will give duplicate case error since char a has the ASCII value 97)
- typedef is used to create new datatypes e.g. typedef pair<int, int> p;
- #define square(x) x*x, Square (4+5)=4+5*4+5=29, not 81
- #define msg "Rohit #is a\ good boy", all the symbols will be removed while executing.
- typedef is limited to giving symbolic names to types only, whereas #define can be used to define an alias for values as well, e.g., you can define 1 as ONE, 3.14 as PI, etc. typedef interpretation is performed by the compiler where #define statements are performed by preprocessor
- Always use scanf() function after the use of EOF(end of file character), if you want to read more inputs in a program. Since the cin operator doesn't work after the EOF. ex: scanf("%d", &var);
- Distance(s.begin(), it) is used to find the index of the iterator in a set. (O based indexing) for vector use it-it2s
- We use greater<int> in a data structure and greater<int>() in a function call to sort descending.
- There is no need to define iterators in vectors.
- **Local variables** or **static variables** are stored in the **Stack** while **Heap Space** is used by the runtime to allocate memory to **Objects**, **JRE classes,** and **global variables**. Whenever we create an object, It's always created in the Heap space.
- There are four storage classes. **auto**, **extern**, **static,** and **register**.

- 
Storage classes in C
Storage Specifier
Storage
Initial value
Scope
Life
auto
stack
Garbage
Within block
End of block
extern
Data segment
Zero
global Multiple files
Till end of program
static
Data segment
Zero
Within block
Till end of program
register
CPU Register
Garbage
Within block
End of block