C programming quick reference pdf

Photo Courtesy: Flashpop/DigitalVision//Getty Images Whether in the form of a fizzy drink or flavored lozenges, cold and flu preventative supplements almost always highlight vitamin C as one of their key ingredients. So, what’s so magical about vitamin C? Also known as ascorbic acid, vitamin C is critical to living healthily. Since the human body cannot spontaneously generate this nutrient, vitamin C must instead be absorbed from outside sources, such as vitamin supplements or foods that are naturally rich in it.What Does Vitamin C Do?Commonly found in cold and flu preventative supplements, vitamin C strengthens and speeds up immune system functionality. Though research does not indicate that vitamin C intake alone can prevent the onset of cold or flu, adequate daily intake may shorten the duration of an infection or lessen the severity of symptoms. Photo Courtesy: Catherine Falls Commercial/Moment/Getty Images Vitamin C is crucial for the maintenance of well being. For example, it plays a role in wound healing and helps maintain many essential body tissues. It also acts as a potent antioxidant and can repair damage from free radicals, which are linked to aging effects, and disease vulnerability. Additionally, vitamin C can also prevent anemia, since it helps the body increase absorption of dietary iron, another vital mineral that the body cannot spontaneously create. Foods that contain high concentrations of vitamin C have been linked with a lower risk of cardiovascular disease, like heart attack and stroke. Vitamin C can also increase levels of nitric oxide, a compound that widens blood vessels and, in turn, lowers blood pressure. In addition, regular intake of vitamin C, along with other vitamins, has been linked to a decreased risk for developing age-related cataracts, a leading cause of visual impairment in the United States.Common Sources of Vitamin CVitamin C can be easily obtained through the many different foods, including: Photo Courtesy: Akaradech Pramoonsin/Moment/Getty Images Citrus fruits and juices (orange, grapefruit, lemon, lime and tangerine) Berries Melons Mangoes Kiwi Tomato Broccoli Red peppers Spinach Squash Potatoes Cooking these foods may result in the loss of some of the vitamin content, so it is ideal to ingest them raw, either whole or juiced. Nowadays, there are also numerous packaged food products, like cereals, that have been enriched and fortified with vitamin C, so that the nutrient can be easily obtained. Vitamin C may also be labeled as “L-ascorbic acid” in supplement form, and most over-the-counter multivitamins contain the recommended daily amount of the vitamin. While it is a good source when an individual is in need of a vitamin C boost, supplements are not meant to replace a diet rich in naturally derived vitamin C.What Happens When You Have Too Much — or Too Little — Vitamin C?Vitamin C is a water-soluble vitamin that can be easily flushed out of the body via urination when it is not needed. Therefore, if the main source of vitamin C is from naturally occurring foods, it is near-impossible for excess vitamin C to produce side effects. However, taking excessive concentrated vitamin C supplements may lead to diarrhea or stomach upset. Photo Courtesy: Violeta Stoimenova/E+/Getty Images Since vitamin C-rich foods are so readily available nowadays, symptoms of inadequate vitamin C intake are also rare in the United States. However, malnourished individuals can experience symptoms of vitamin C deficiency over time, including: Weakness Fatigue Anemia Easy bruising Joint pain Skin breakdown Weakened tooth enamel Gum inflammation Severe vitamin C deficiency is referred to as scurvy. Scurvy can be easily treated with increased dietary or supplemental vitamin C. Since vitamin C is crucial in the detoxification of the body, a lack of vitamin C can compromise the immune system and make an individual more susceptible to diseases and infections. Individuals with insufficient vitamin C may find that it takes longer than usual to recover from a cold or a physical wound. Daily Dosage Recommendations: The daily dosage recommendation for vitamin C is different for everyone, depending on factors such as gender, age, lifestyle and current health condition. The recommended daily dosage for vitamin C is at least 75 mg daily for women and 90 mg for men. Since people who are pregnant, breast feeding, smoking or using oral contraceptives have a lower blood level of vitamin C than others, larger doses of vitamin C may be needed to achieve optimal results in these individuals. Those who have prior or current medical conditions may also require bigger or smaller dosage levels, as recommended by their healthcare providers. Resource Links: MORE FROM SYMPTOMFIND.COM C Info (Quick Reference) Introduction C was originally developed by Dennis Ritchie of the Bell Laboratories in 1972. It is also called "Common C" or "Classic C". The language was named "C" because it was the successor to a language named "B". C is a structured, procedural programming language that has been widely used both for operating systems and applications and that has had a wide following in the academic community. Many versions of UNIX-based operating systems are written in C. C has been standardized as part of the Portable Operating System Interface (Portable Operating System Interface). Nowadays, with the increasing popularity of object-oriented programming, C is being rapidly replaced as "the programming language" by C++, a superset of the C language that uses an entirely different set of programming concepts, and by Java, a language similar to but simpler than C++, that was designed for use in distributed networks. The American National Standards Institute defined a standard for C, called ANSI C, eliminating much uncertainty about the exact syntax of the language. ANSI C incorporate a few improvements over the old common C and the main difference is in the grammar of the language. The form of function declarations has been changed making them rather more like Pascal procedures. Nowadays, most of the C programming texts are available in ANSI editions. C Standard Library : Diagnostics : Character Class Tests : Error Codes Reported by (Some) Library Functions : Implementation-defined Floating-Point Limits : Implementation-defined Limits : Locale-specific Information : Mathematical Functions : Non-local Jumps : Signals : Variable Argument Lists : Definitions of General Use : Input and Output : Utility functions : String functions : Time and Date functions References: The C Programming Language, by Brian Kernighan and Dennis Ritchie - Prentice-Hall, ISBN 0-13-110362-8 C Programming Notes - by Steve Summit - UW Experimental College - Washington Programming in C - UNIX System Calls and Subroutines using C - A. D. Marshall 1994-9 The Program Development Cycle The Program Development Cycle for an application program written in C is summarized below : 1. Creating a program - Use a text editor to create or modify the source program. To identify your program as a C program, UNIX expects you to store your program in a file whose name ends in .c (Remark: You can use any available editor. For example: Emacs, Xemacs, pico or vi.). 2. Compiling the Program - As follows find four ways to achieve this, though the three first eventually rely on the compiler (called cc on our system), and the last one rely on another compiler. Just choose one of them. a) Using C Compiler < cc > - This is the simplest method. Just type: > cc [-options] filename.c (To check all options type man cc) This will try to compile filename.c, and, if successful, will produce a runnable file called a.out. If you want to give the runnable file a better name you can type: > cc filename.c -o filename This will compile filename.c, creating runnable file filename. (It is better keep the same name for the source and the runnable programs.) b) Using a Program Builder < make > - UNIX also includes a very useful program called make. Make allows very complicated programs to be compiled quickly, by reference to a configuration file (usually called Makefile). If your C program is a single file, you can usually use make by simply typing: > make [-options] filename (To check all options type man make). This will compile filename.c and put the executable code in filename. c) Using Improved Type Checking < lint > - The checker called lint will not generate any runnable code. You can use it, typing: > lint [-options] filename.c (To check all options type man lint). Lint is very good at detecting errors which cause programs to crash at run time. A disadvantage of lint is the fact that lint generally produces a long list of messages about minor problems with the program. Experience will teach you how to distinguish the important messages from those which can be ignored. Comments: The order of the options may be changed. You could type: cc -o filename filename.c. Care about the options Use the extension .out to name your runnable (or executable) files. It will help you to distinguish your files d) Using the GNU Compiler < gcc > - GCC is a free compiler collection for C, C++, Fortran, Objective C and other languages. It is also available in our server. GCC works very similar than CC. > gcc [-options] filename.c (To check all options type man gcc). 3. Running the progam - To run a program under UNIX you simply type a.out or , in case you gave a better name, just type the filename. >a.out (If you did not give a better name.) OR > filename.out (Use the same extension you choose during the compilation step. In our case .out. If you did not choose any extension, just type filename) You will see your prompt again after the program is done. If logical or run-time errors are encountered when the program is executed, it will be necessary to return to step 1, correct the errors and repeat steps 2 and 3. Example: A simple program. 1. Creating a program. >pico hello.c and type the following code: #include main() { printf("Hello World !! This is a C program !! "); } 2. Compiling the Program, using C Compiler cc. >cc hello.c -o hello.out 3. Running the progam. - To run a program under UNIX you simply type in the filename. >hello.out The program will print the message and you will see your prompt again after the program is done. Hello World !! This is a C program !! > [back] C - Quick Reference Structure of a C Program Every C program contains a function called main, and must appear once, and only once in every C program. The function main is the start point of the program, but it does not have to be the first statement in the program. Because main is a function is must be followed by a pair of parentheses - main(). Normally the first line is #include . It allows the program to interact with the screen, keyboard and file system of your computer. You will find it at almost every C program. It is a preprocessor directive. The curly brackets, or braces, show the start and the end of the function main(). /* This is a comment. */ #include main() { ....; } Separating Statement The semicolon (;) is used as a statement separator. It signals to the compiler that a statement is complete. Grouping Statements Curly brackets, or braces, ({ and }) are used to group statements together as in a function, or in the body of a loop or selection. It is known as a compound statement or a block. Comments Explanations about a program's operation are called comments. C Language uses the slash star combination as comments delimiters, (/* and */). Keywords There are some words reserved by the C Language and they are defined as keywords. They have a predefined meaning and can be used only for their intended purpose. They can not be arbitrarily redefined by the programmer. They are always written in lower case. In ANSI/ISO C Language, there are 32 keywords. A complete list follows: auto break case char const continue default do double else enum extern float for goto if int long register return short signed sizeof static struct switch typedef union unsigned void volatile while In addition to this list of keywords, your compiler may define a few more. For further information, check the documentation of your compiler. Identifiers An identifier is a name that is given to some program element, such as a constant, a variable, a function, a data definition, etc. C is case sensitive, that is, a lower case letter and it's upper case are different. Most C programs are in lower case letters. Usually upper cases are found in preprocessor definitions, constants or inside quotes as parts of character strings. They consist of letters, digits and underscore (_) characters, in any order, except that the first character must be a letter or an underscore. Since most compiler writers use the underscore as the first character for variable names internal to the system, it is not recommended to use underscore to begin an identifier to avoid the possibility of a name clash. They should contain enough characters so that its meaning is readily apparent (mnemonic). On the other hand, an excessive number of characters should be avoided. The Common C considers significant only the first 8 characters of an identifier. Most modern ones do not apply this limit though. The ANSI C considers the first 31 characters. To be sure about this matter, check the documentation of your compiler. Keywords, or reserved words, can not be used as identifiers. The following names are examples of valid identifiers: abc total counter factorial power sum x1 x2 in_file out_file The following names are examples of not valid identifiers for the reasons stated. c-max 4thValue while last word Characters other than letters and digits are not allowed. The first character must be a letter. while is a reserved word. (See Appendix A). Blank spaces are not allowed (a blank space is a character). Data Types C Language provides various data types. The most common are: - int - store integers – the positive and negative counting numbers. (e.g. -234,-1,0,1,234). - float - store floating points numbers - i.e. including decimal points, or are expressed as powers of 10. (e.g. -3.5, 0.0, 1E-02, 4.5E02, 6.02e+23). - char - store a single byte of memory, enough to hold any of the characters - letters, punctuation marks, digit and special characters - that appear on the character set. (e.g. ‘a’,’$’,’3’). Special characters are represented by special patterns. A backslash leading a (sequence of) character(s). A list of them follows: C code Meaning \b \f \r \t \\ \' \" \0 Backspace Form Feed Newline (linefeed + carriage return) Carriage Return Tab Backslash Single quote Double Quote NULL They are also several variants on these types. A list follows: - short - An integer, possibly of reduced range. - long - An integer, possibly of increased range. - unsigned - An integer with no negative range, the spare capacity being used to increase the positive range. - unsigned long - Like unsigned, possibly of increased range. - double - A double precision floating point number. All of the integer types plus the char are called the integral types. Float and double are called the real types. Constants A C constant is usually just the written version of a number. (e.g. 1, 0, 9.734, 12.3e4). It is possible to specify our constants in octal or hexadecimal, or force them to be treated as long integers. Octal constants are written with a leading 0 (zero). e.g. 023. Hexadecimal constants are written with a leading 0x (zero and x). e.g. 0x123abc. Long constants are written with a trailing L. e.g. 450L. Character constants are usually just the character enclosed in single quotes; 'a', 'b', 'c'. Excepted those special characters, represented by a sequence of characters leaded by a backslash. (e.g. '', '\\'). String constants are more convenient than character constants. A string constant is enclosed by double quotes, e.g. "This is a string". The string is actually stored as an array of characters. The null character '\0' is automatically placed at the end of such a string to act as a string terminator. Remember that a character is a different type to a single character string. Symbolic Constants Symbolic constants are conventionally written in upper case so they can be distinguished from variables names. There is no semicolon at the end of a #define statement. Use meaningful names to symbolic constants in order to let programs more readable. The syntax is: #define For example: #define city "Macau" #define tax 1.5 #define step 20 Variables In C, a variable must be declared before it can be used. Conventionally, variables names are written in lower case. A variable declaration begins with the type, followed by the name (see Identifiers) of one or more variables. For example, int a, x, counter; char letter; float average; A variable can also be initialized when it is declared. Just add an equals and the value after the declaration. For example: It is equivalent to: int counter; counter = 1; Variable declarations can be spread out, allowing space for comments. For example: int total; /* Total of salaries */ int marks[10] /* Series of input marks */ char letter; /* Letter grade */ float average; /* Average of sales */ Variables can be declared at the beginning of any block of code, but most are found at the beginning of each function. Scope of Variables Global Variables - They are available to all functions, but excessive use of them is not recommended in order to avoid poor program structure. - They are located outside any of the program's functions. Usually at the beginning of the program file, but after preprocessor directives. - They do not need to be declared again in the body of the functions which access them. Local variables - They are declared within the body of a function, and can only be used within that function. - Most local variables are created when the function is called, and are destroyed on return from that function. - Data can be passed between functions as arguments. - Local variables takes precedence over a like-named global variable. Class of Variables External Variables - Where a global variable is declared in one file, but used by functions from another, then the variable is called an external variable in these functions, and must be declared as such. - The declaration must be preceded by the word extern. Compare the following example: #include int a = 123; /* global variable */ main() { printf ("%d%d",a,b); } int b = 456; /* global variable */ #include int a = 123; /* global variable */ main() { extern int a,b; printf ("%d%d",a,b); } int b = 456; /* global variable */ >cc test.c >"test.c", line 7: undefined symbol: b cc: acomp failed for test.c > > > cc test.c >a.out 123 456 > - Global and external variables can be of any legal type. They can be initialized, but the initialization takes place when the program starts up, before entry to the main function. - It is also recommended to avoid using external variables. Static Variables - Like local variables, static variables can only be accessed from the function in which they were declared. - Instead of destroying their values on exit from the function, static variables preserve their values, and make them available again when the function is next called. - Static variables are declared as local variables, but the declaration is preceded by the word static. - Static variables can be initialized as normal, the initialization is performed once only, when the program starts up. For example: { static int a; static sum=0; float pi=3.14; } Automatic Variables - By default, if a variable does not have a class, the compiler will assume as automatic variable. - Like local variables, automatic variables can only be accessed from the function in which they were declared. - The declaration must be preceded by the word auto, but nowadays they seldom appear in C programs. Register Variables - They are used as automatic variables. It is not recommended because they are confuse and do not give any advantage. - The purpose is to store values direct in the registers and not in the memory of the computer. But, it does not work as planned. In some machines, it can not be implemented and the compiler and the language have problems to manage them. Arrays An array is a collection of variables of the same type. Within an array, elements are identified by an integer index. The index begins at zero and is always written inside square brackets. Arrays can have one or more dimensions. Each index has its own set of square brackets. For example: int numbers[20]; /* this is a single-dimension array */ int numbers_2d[20][5]; /* this is a two-dimension array */ int numbers_3d[20][5][3]; /* this is a three-dimension array */ Where an array is declared in the main function it will usually have details of dimensions included. When passed as an argument to a function, the receiving function need not know the size of the array. So for example if we have a function which sorts a list (represented by an array) then the function will be able to sort lists of different sizes. The drawback is that the function is unable to determine what size the list is, so this information will have to be passed as an additional argument. As an example, here is a simple function to add up all of the integers in a single dimensioned array. int add_array(int array[], int size) { int i; int total = 0; for(i = 0; i < size; i++) total += array[i]; return(total); } Strings A string is a group of char type data - letters, digits or special characters - terminated by a null character. A string is simply a special case of an array, a series of char type data. Operators and Expressions Arithmetic operators - The most common arithmetic operators: + - * / % Addiction Subtraction Multiplication Division Modulo Reduction (Remainder from Integer Division) - The operators *, / and % will be performed before + or - in any expression. - Parentheses or brackets change the order of evaluation, because a sub-expression within parentheses gets evaluated before the rest of the expression. In nested expression, calculations are done from the inside out. - Where division is performed between two integers, the result will be an integer, with remainder discarded. - Modulo reduction works with integers. - Division by zero, will cause an error, usually causing the program to crash. - Examples of arithmetic expressions used within assignment statements: sum=sum + number; counter=counter + 1; area = pi * radius * radius; - C has some operators which allow abbreviation of certain types of arithmetic assignment statements. Operator Shorthand Equivalent to Increment Decrement ++i; or i++; --i; or i--; i = i + 1; i = i - 1; - These operations are usually very efficient and they can be combined with another expression. - Care about where the operator occurs. These can cause confusion if you try to do too many things on one command line. Restrict the use of the increment and the decrement operators to ensure that your programs stay readable. As follows some examples: Expression Equivalent to a = b * c++; a = b * c; c = c + 1; a = b * ++c ; c = c + 1; a = b * c; Another shorthand notation is listed below: Expression Equivalent to a += 10 a -= 10 a*= 10 a /= 10 a = a + 10 a = a - 10 a = a * 10 a = a / 10 Relational and Logical Operators - C Language has no special type to represent logical or Boolean values. - The Relational and Logical Operators are used to compare two numeric values and produce a logical result. - As follows, a list with those operators: Relational Operators Meaning > >= < ~ bitwise AND bitwise inclusive OR bitwise exclusive OR left shift right shift one's complement (unary) Precedence and Associativity of Operators - The following table summarizes the rules for precedence and associativity of all operators. Operators on the same line have the same precedence; rows are in order of decreasing precedence. Operators Associativity ( ) [ ] -> . ! ~ ++ -- + - * (type) sizeof * / % + - = == != & ^ | && || ?: = += -= /= %= ^= |= = . left to right right to left left to right left to right left to right left to right left to right left to right left to right left to right left to right left to right right to left right to left left to right Conditional Expressions Conditional expressions are written with the ternary operator (?:). The expression expr1 is evaluated first. If it is non-zero (true), then the expression expr2 is evaluated, and that value is the value of the conditional expression. Otherwise expr3 is evaluated, and that is the value. Only one of expr2 and expr3 is evaluated. The syntax is: For example: (The three forms are equivalent.) largest = (a > b) ? a : b; z = max(a,b); if (a>b) z=a; else z=b; It could be used wherever any other expression can be. For example: printf ("You have %d items%s.", n, n==1 ? "" : "s"); Assignment Statement It is the most frequently used statement in programming. The assignment operator (=) changes the value of a variable within a program – to initialize, or to alter its current value. A variable must be initialized, or given a starting value, before it can appear in an expression. The variable is undefined until it is initialized. The syntax is: Variable identifier = the value represented by an expression For example: age = 18 ; firstletter = ‘A’ ; sum=0; area = radius*radius*pi ; a=b+1; Type conversion - You can mix the types of values in your arithmetic expressions. char types will be treated as int. Otherwise where types of different size are involved, the result will usually be of the larger size, so a float and a double would produce a double result. Where integer and real types meet, the result will be a double. - There is usually no trouble in assigning a value to a variable of different type. The value will be preserved as expected except where; The variable is too small to hold the value. In this case it will be corrupted (this is bad). The variable is an integer type and is being assigned a real value. The value is rounded down. This It is often done deliberately by the programmer. - Values passed as function arguments must be of the correct type. The function has no way of determining the type passed to it, so automatic conversion cannot take place. This can lead to corrupt results. The solution is to use a method called casting which temporarily disguises a value as a different type. Example: The function sqrt finds the square root of a double. int i = 256; int root root = sqrt((double) i); Explanation: The cast is made by putting the bracketed name of the required type just before the value. (double) in this example. The result of sqrt((double) i); is also a double, but this is automatically converted to an int on assignment to root. Control Structures Statements and Blocks - Use semicolon (;) to terminate a statement and braces ({ and }) to group statements. If-Else Statement - The if-else is a selection statement. It is used to express decisions. - Multi-way decision can represented by a sequence of if-else statements. (See example 3) - The syntax is: if (expression) statement_1; /* if expression is true perform statement_1 */ else statement_2; /* if expression is false perform statement_2 */ For example: if (a > b) max = a; else max = b; if (counter b) { max = a; min = b; } else { max = b; min = a; } if (result >= 90) printf("Grade A"); else if (result >= 70) printf("Grade B"); else if (result >= 50) printf("Grade C"); else printf("Failed"); Switch Statement - This is another form of the multi-way decision. It tests whether an expression matches one of a number of constant integer values, and branches accordingly. - The syntax is: switch (expression) { case constant_expression : statements case constant_expression : statements ... default: statements /* default is an optional */ } For example: switch(number) { case 0: printf("Zero"); break; /* the break statements causes an immediate exit from the switch */ case 1: /* case serves just as labels, without the break, the execution will */ printf("One"); /* falls through to the next unless you take explicit action to escape*/ break; case 2: printf("Two"); break; case 3: case 4: /* No break statement, the execution continue on allowing the */ case 5: /* same action for case 5. */ printf("Several"); break; default : printf("Many"); break; } While Statement - The while loop keeps repeating an action until an associated test returns false. This is useful where the programmer does not know in advance how many times the loop will be traversed. - The syntax is: while (expression) statement; For example: while (i < 10) printf("%d",i++); printf("We are out of the loop."); while (i < 10) { printf("%d",i++); printf("We are in the loop."); } Do-While Statement - The do while loops is similar, but the test occurs after the loop body is executed. The loop will always run at least once. - The syntax is: do statement while (expression); For example: do printf("%d",i++); while (i < 10); printf("We are out of the loop."); do { printf("%d",i++); printf("We are in the loop."); } while (i < 10); For Statement - The for loop is frequently used, usually where the loop will be traversed a fixed number of times. It is very flexible, and novice programmers should take care not to abuse the power it offers. - Commonly expression1 is the initial value of the loop variable; expression2 is a test, when it becomes true the loop stops; and expression3 is the increment of the loop counter. - But, any of the three parts can be omitted, although the semicolons must remain. In this case, in order to avoid an infinite loop, the programmer must break by other means, such as a break or return. - The syntax is: for (expression1;expression2;expression3) statement For example: for (i=1; i x and p->y. Remember that *p.x is the same as *(p.x) !!! C File Handling - File Pointers C communicates with files using a new datatype called a file pointer. This type is defined within stdio.h, and written as FILE *. A file pointer called output_file is declared in a statement like Your program must open a file before it can access it. This is done using the fopen function, which returns the required file pointer. If the file cannot be opened for any reason then the value NULL will be returned. You will usually use fopen as follows if ((output_file = fopen("output_file", "w")) == NULL) fprintf(stderr, "Cannot open %s", "output_file"); fopen takes two arguments, both are strings, the first is the name of the file to be opened, the second is an access character, which is usually one of: r – open file for reading w – create file for writing a – open file for appending Standard file pointers in UNIX UNIX systems provide three file descriptors which are automatically open to all C programs. These are stdin – The standard Input. The keyboard or a redirected input file. stdout – The standard Output. The screen or a redirected output file. stderr –The standard Error. This is the screen, even when the output is redirect. This is the conventional place to put any error message. Since these files are already open, there is no need to use fopen on them. The fclose command can be used to disconnect a file pointer from a file. This is usually done so that the pointer can be used to access a different file. Systems have a limit on the number of files which can be open simultaneously, so it is a good idea to close a file when you have finished using it. This would be done using a statement like If files are still open when a program exits, the system will close them for you. However it is usually better to close the files properly. Reading and writing files - functions fprintf and fscanf a commonly used to access files. int fprintf(FILE *stream, char *format, args..) int fscanf(FILE *stream, char *format, args..) These are similar to printf and scanf except that data is read from the stream that must have been opened with fopen(). The stream pointer is automatically incremented with ALL file read/write functions. We do not have to worry about doing this. char *string[80] FILE *stream, *fopen(); if ((stream = fopen(...)) != NULL) fscanf(stream,``%s'', string); Other functions for files: int getc(FILE *stream), int fgetc(FILE *stream) int putc(char ch, FILE *s), int fputc(char ch, FILE *s) These are like getchar, putchar - getc is defined as preprocessor MACRO in stdio.h. fgetc is a C library function. Both achieve the same result!! fflush(FILE *stream) -- flushes a stream. fclose(FILE *stream) -- closes a stream. We can access predefined streams with fprintf etc. fprintf(stderr,``Cannot Compute!!n''); fscanf(stdin,``%s'',string);

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