```
17    string sInput;
18    int iLength, iN;
19    double dblTemp;
20    bool again = true;

21    while (again) {
22        iN = -1;
23        again = false;
24        getline(cin, sInput);
25        system("cls");
26        stringstream(sInput) >> dblTemp;
27        iLength = sInput.length();
28        if (iLength < 4) {
529           again = true;
530           continue;
531       } else if (sInput[iLength - 3] != '.') {
532           again = true;
533           continue;
534       } while (++iN < iLength) {
535           if (isdigit(sInput[iN])) {
                  continue;
              } else if (iN == (iLength - 3) ) {
          } else if (...
```

CRASH COURSE ON C

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C LANGUAGE ORIGIN

- Developed at Bell Laboratories (begin of 70) by Dennis Ritchie (a pioneer of UNIX)
- First implementation on DEC PDP-11 on UNIX OS
- By many year the "De-Facto Standard" of the language is contained in the book by Kernighan e Ritchie.
- In 1983 the ANSI committee define the first standard for C language
- Next evolved in **C89**, C90, C95, C99, **C11, C18**

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C FEATURES

- ## Is an intermediate level language

Its easy to combine high level formalist with low level instruction (like the assembly)

- ## Easy low level manipulation of bit, byte, word pointers

C is target for OS development and/or hardware interface

- ## C for many year was a good choice for the development of general purpose library, compilers, OS, low level interface driver, …

C CHARACTERISTIC

- **C is a structured language**
  - C has the ability to store information and use instruction that are hidden

- **C is primitive language**
  - No feature are built in in the language

I/O is done by libraries

MATH is done by libraries

STRING manipulation is done by libraries

…

- **C is a compiled language**
  - There are dialect of C that are interpreted

https://gitlab.com/zsaleeba/picoc (PICO C)

http://www.softintegration.com (CH interpreter)

- **C is free (mainly)**
  - The C compiler is universally availble in any OS, the GNU C is available virtually on any hardware.

C MAIN PROGRAM

A C program consists of a single function named **main.**

The function must return an integer

```c
// I am a single line comment
/*
  I am a multi line comment
*/

int // the function return a value of type "integer"
main() {

  /*\
   | fill lines by user code
   |
  \*/

  return 0;
}
```

COMPILING AND LINKING

- **Compiling operation**

    - **Compilation** refers to the processing of source code files (.c, .cc, or .cpp) and the creation of an 'object' file. This step doesn't create anything the user can actually run. Instead, the compiler merely produces the machine language instructions that correspond to the source code file that was compiled.

- **Linking operation**

    - **Linking** refers to the creation of a single executable file from multiple object files. In this step, it is common that the linker will complain about undefined functions (commonly, main itself). During compilation, if the compiler could not find the definition for a particular function, it would just assume that the function was defined in another file. If this isn't the case, there's no way the compiler would know -- it doesn't look at the contents of more than one file at a time. The linker, on the other hand, may look at multiple files and try to find references for the functions that weren't mentioned.

C BASIC DATA TYPE AND OPERATOR

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C KEYWORDS

- ## Type of data

void, char, int, float, double, enum, struct, union

- ## Modification of data size/storage

signed, unsigned, short, long, extern, static, register, cost, volatile

- ## Conditions and loops

if, else, do, while, for, continue, break, goto, switch, case, default

- ## Operatos

assign, **=**, logical **||** (or) **&&** (and), **!** (negation)

arithmetic, **+**, **-**, *, /, **%** (remainder only for integer)

comparison **>**, **<**, **>=**, **<=**, **==**, **!=**

bit manipulation, **&**, **|**, **~**, **>>**, **<<**

- ## Other keywords

main, return, typedef, sizeof

SIZE OF MAINLY USED DATA

Data Type	Keyword	Size
character	char	Generally 1 byte
integer	int	Generally 4 bytes
floating point	float	Generally 4 bytes
double floating point	double	Generally 8 bytes
valueless	void	no size

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SIZE MODIFIER

Modifier	apply to
long	int, double
short	int
signed	char, int
unsigned	char, int

Notice that **unsigned int** can be shorted to **unsigned**

short int and **long int** can be shorted int **short** and **long** respectively

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CONSTANTS

- **characters**

a character is defined a letter/number between quote, e,g,

- 'a', 'h', '1'

special ascii character like new line, tab have special code prefixed by \

- '\n' new line
- '\t' tab
- '\r' return

any ascii code can be inserted with **** followed by **0N** where **N** is an octal integer. For example the ascii character '+' that correspond to the ascii character number 43 (56 in octal) can be accessed with '\056'

- **strings**

are simply a consecutive sequence (array) of character terminated by the special character '\0' (zero). They are denoted by double quote:

"mikey mouse"

"pluto" ('p', 'l', 'u', 't', 'o', '\0')

CONSTANTS

- **integer**

are written as usual, can specify special end character to define unsigned (U) long (L), long long (LL)

    123 (normal integer)

    123U (unsigned integer)

    123UL (unsigned long integer)

123L (signed long integer)

    Special prefix are used to insert octal or exadecimal number

    0xFF (the number 255 in decimal notation 15+16*15)

    077 (the number 63 in decimal notation 7+8*7)

- **floating point number**

constant number with dot are by default double precision (**double**), single precision (**float**) must be terminate by **f**

    123.0 (double number)

123**f** or 123.0**f** (float number)