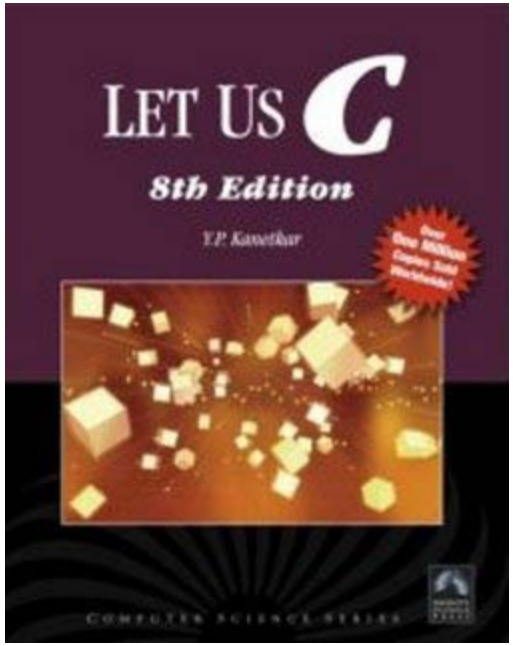
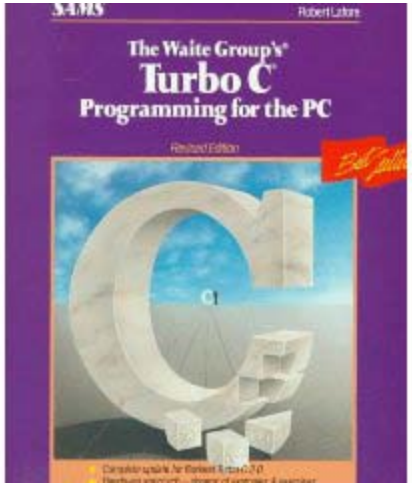
Lecture 3
Introduction to C language

Reference Books

- **Let Us C** by Yashavant P. Kanetkar



- **Turbo C** by Robert Lafore



What is a Program?

- A Precise sequence of steps to solve a particular problem.
  - Precise=exact
  - Sequence= what should be first, what should be second, and so on..
  - And there should be any problem to solve.

What is a programming Language?

- A vocabulary and set of grammatical rules for instructing a Computer to perform specific tasks. Each language has a unique set of keywords (words that it understands) and a special syntax for organizing program instructions.

Ask 8 different Computer Scientists, get 8 different answers!

- formal notation for computations
- tool for writing programs
- means of communicating between programmers
- vehicle for expressing high-level designs
- notation for algorithms
- way of expressing relationships between concepts
- tool for experimenting with solutions to problems
- means for controlling computerized devices

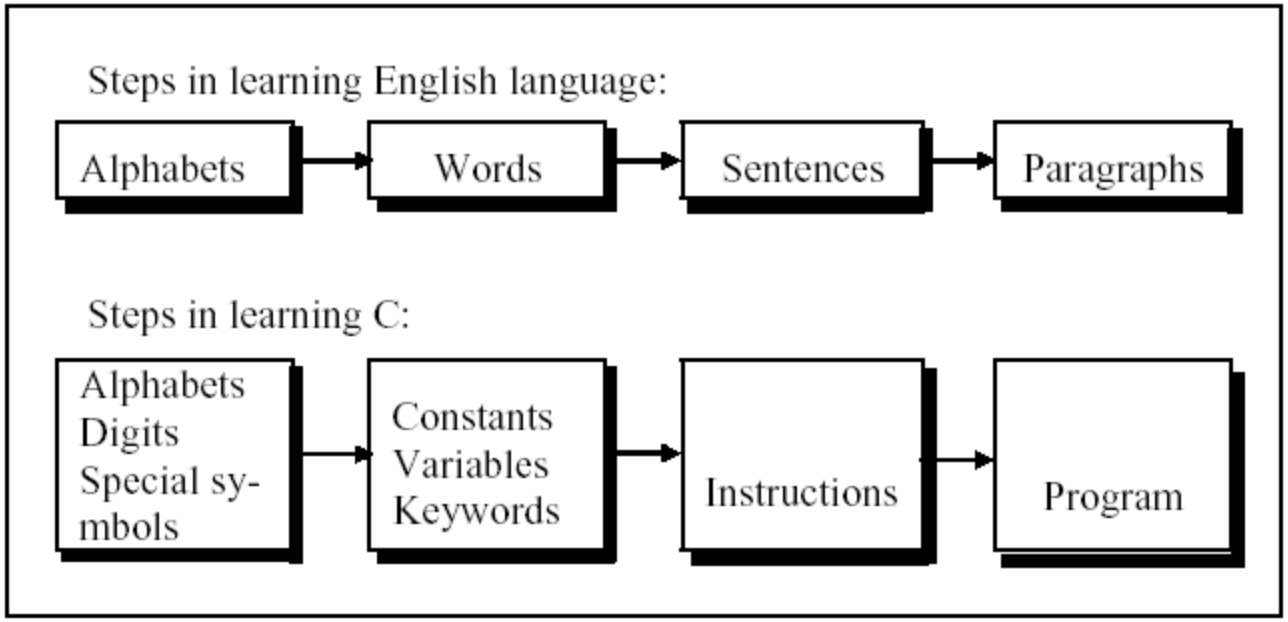
Introduction to C Language

Dennis Ritchie

- C is a programming language.
- It was developed at AT & T's Bell Laboratories of USA in 1972.
- It was designed and written by a man named Dennis Ritchie.

Reasons to learn C

- Main reason is its simplicity reliability, and its easy to use and easy to learn


Steps in learning English language:
Alphabets
Words
Sentences
Paragraphs
Steps in learning C:
Alphabets
Digits
Special sy-
mbols
Constants
Variables
Keywords
Instructions
Program

Some Definitions

- **Syntax(form):-**The syntax of a language describes the possible combinations of symbols that form a correct program.

- **IDE:-** It is a screen display with pull down menus. We use menu selections to invoke all the operations necessary to develop our program.

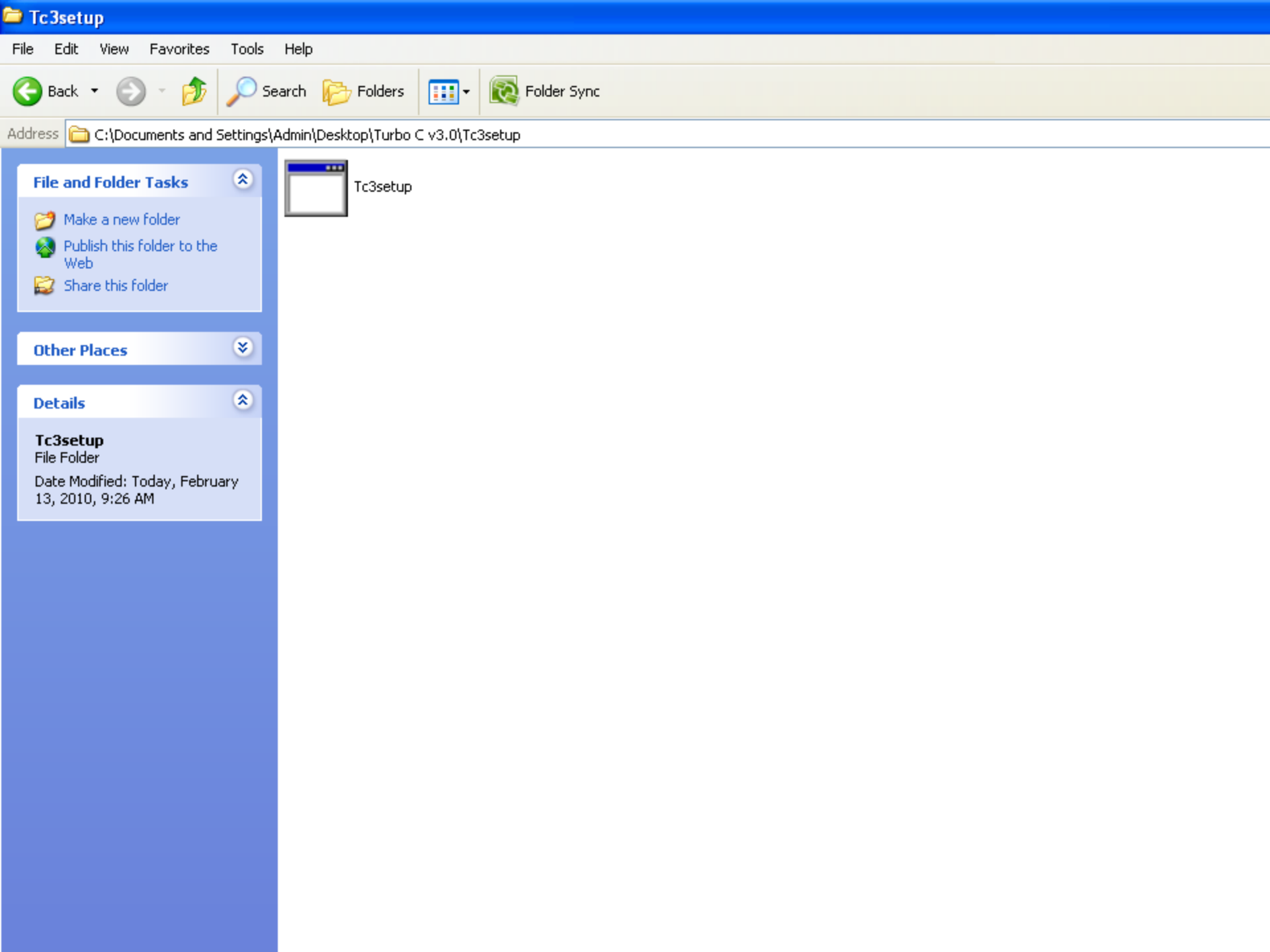
- **Compiler:-** It is the part of IDE, that translates our source file into machine language.

- **Keyword:-** Keywords are the words whose meaning has already been explained to the C compiler

How to install Turbo C

Download tc3setup.exe file from
http://www.sirjameel.com

Exact link is as below:
http://www.sirjameel.com/lecture_notes/NED/Graduation/CSIT/c_language.html


Tc3setup
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Search
Folders
Folder Sync
Address
C:\Documents and Settings\Admin\Desktop\Turbo C v3.0\Tc3setup
File and Folder Tasks
Make a new folder
Publish this folder to the Web
Share this folder
Other Places
Details
Tc3setup
File Folder
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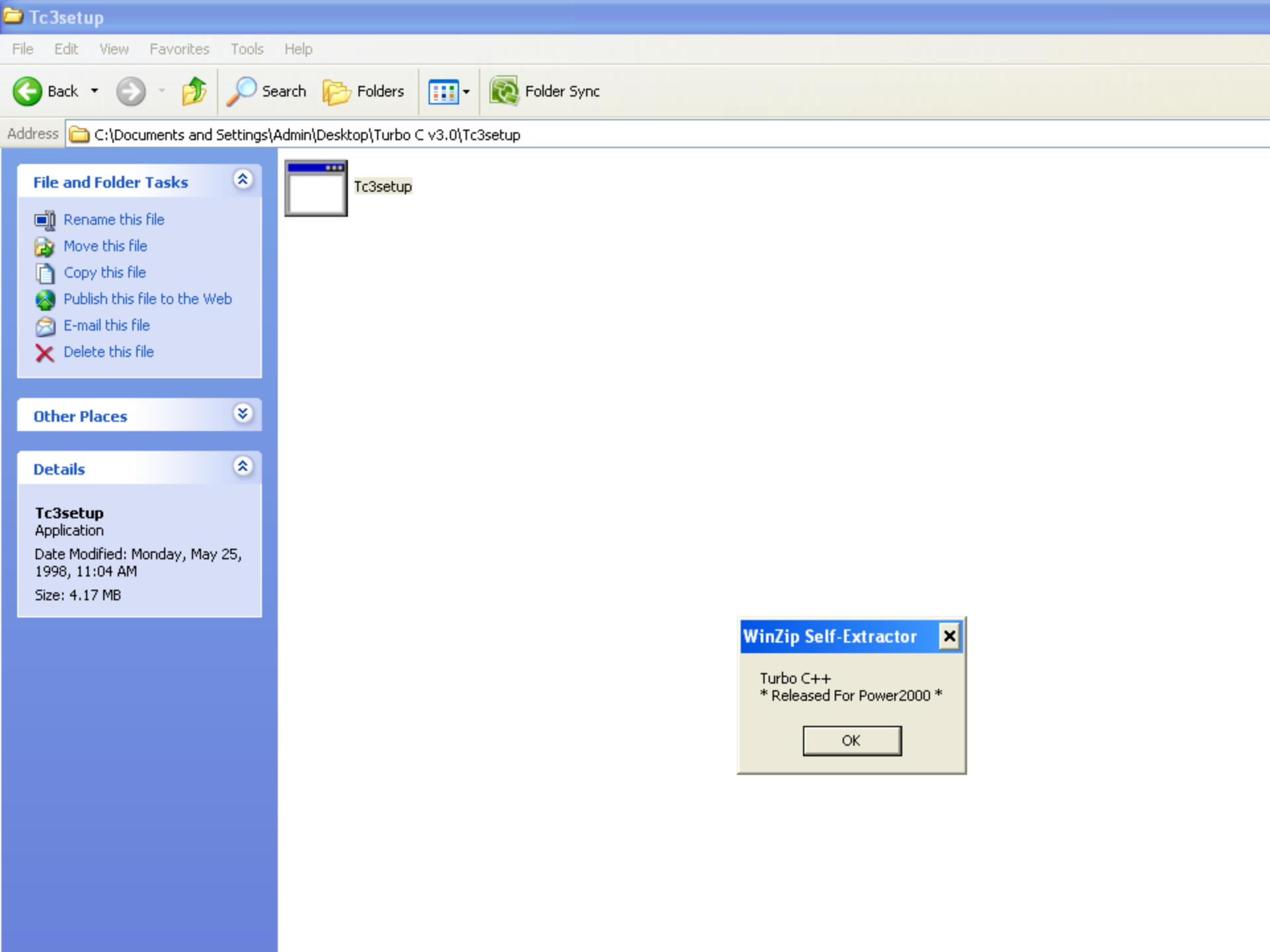
Tc3setup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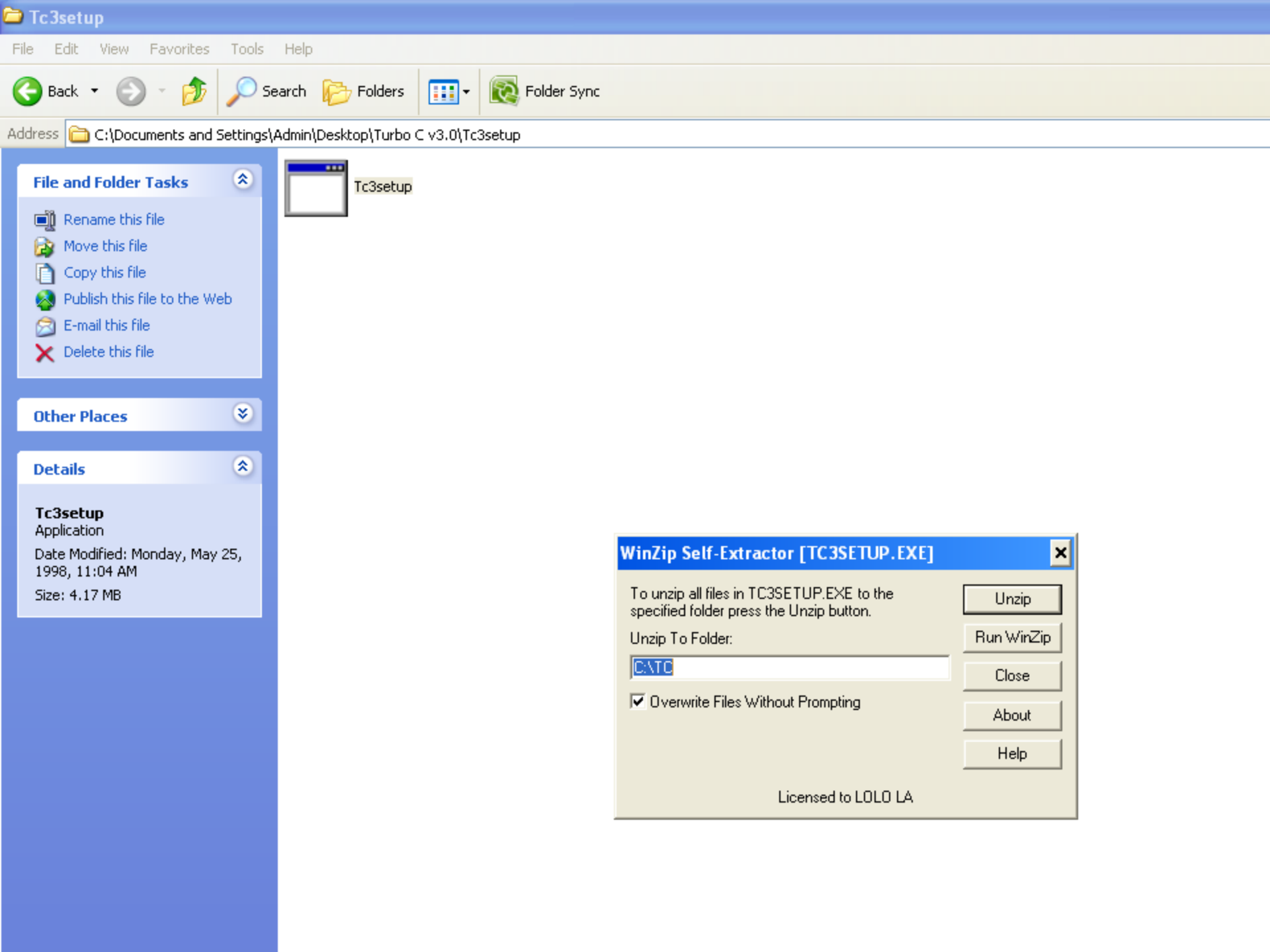
Size: 4.17 MB
Tc3setup
WinZip Self-Extractor
Turbo C++
* Released For Power2000 *
OK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Size: 4.17 MB
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WinZip Self-Extractor [TC3SETUP.EXE]
To unzip all files in TC3SETUP.EXE to the specified folder press the Unzip button.
Unzip To Folder:
C:\TC
Overwrite Files Without Prompting
Unzip
Run WinZip
Close
About
Help
Licensed to LOLO LA

Tc3setup

File Edit View Favorites Tools Help

Back Search Folders Folder Sync

Address C:\Documents and Settings\Admin\Desktop\Turbo C v3.0\Tc3setup

File and Folder Tasks

- Rename this file
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- Copy this file
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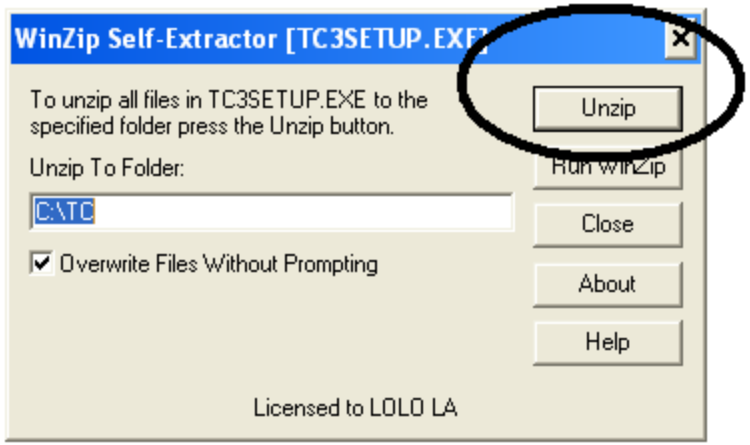

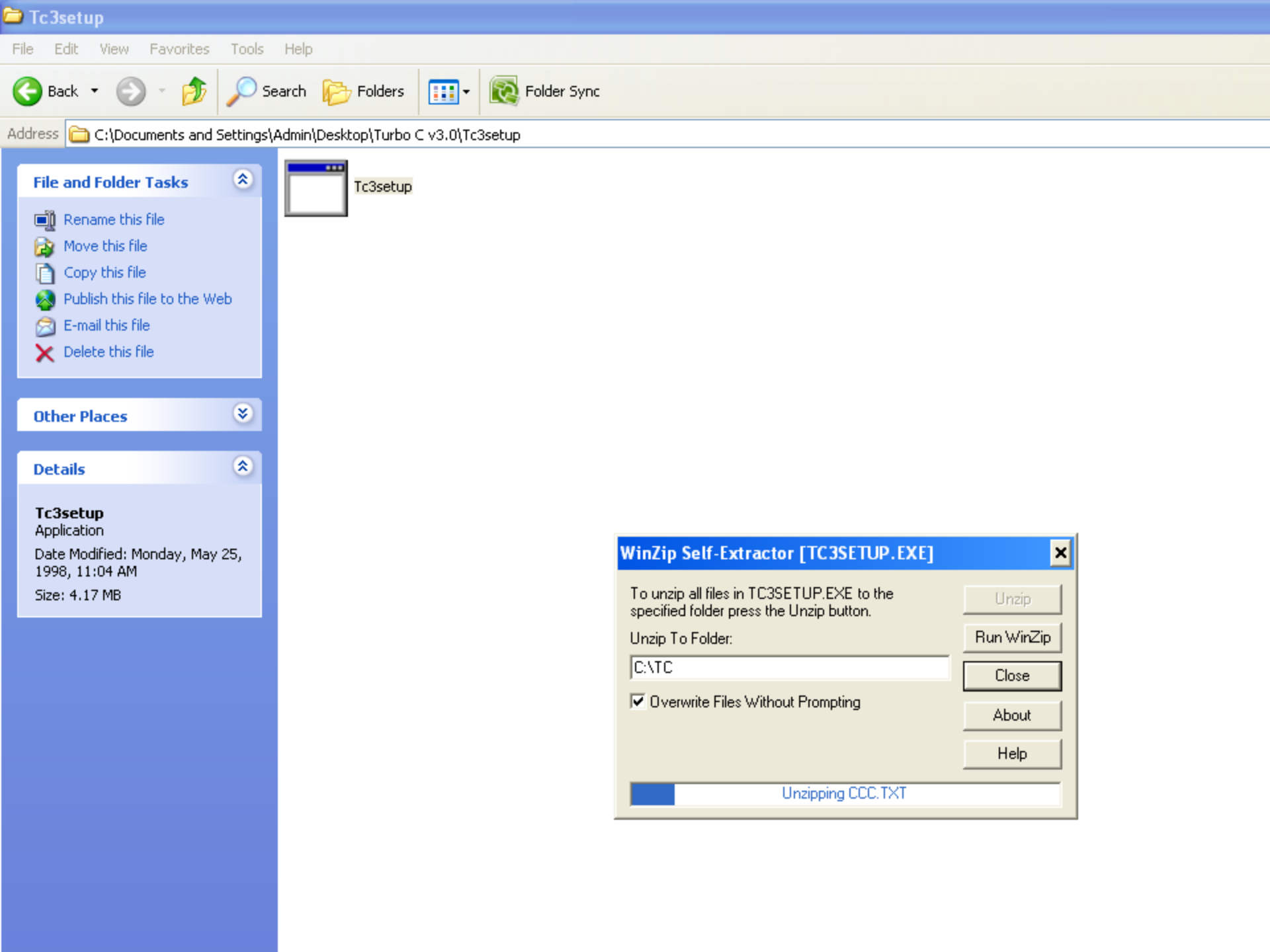
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Tc3setup
WinZip Self-Extractor [TC3SETUP.EXE]
To unzip all files in TC3SETUP.EXE to the specified folder press the Unzip button.
Unzip To Folder:
C:\TC
Overwrite Files Without Prompting
Unzip
Run WinZip
Close
About
Help
Unzipping CCC.TXT

Tc3setup

File Edit View Favorites Tools Help

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Address C:\Documents and Settings\Admin\Desktop\Turbo C v3.0\Tc3setup

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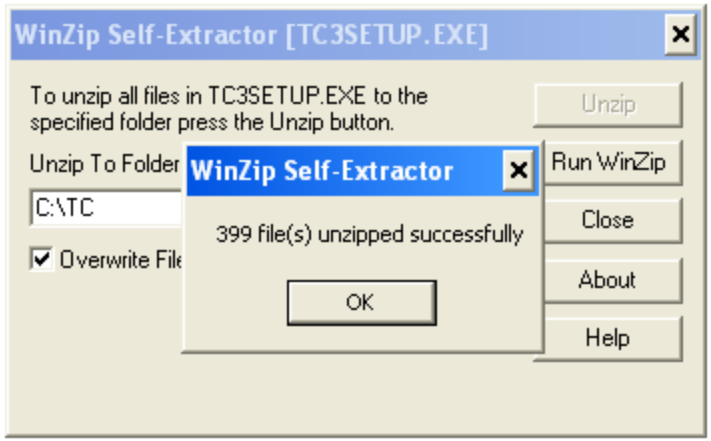

Tc3setup

File Edit View Favorites Tools Help

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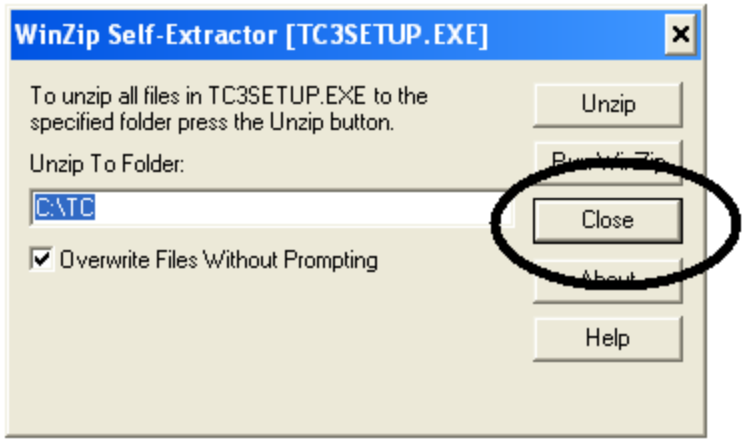
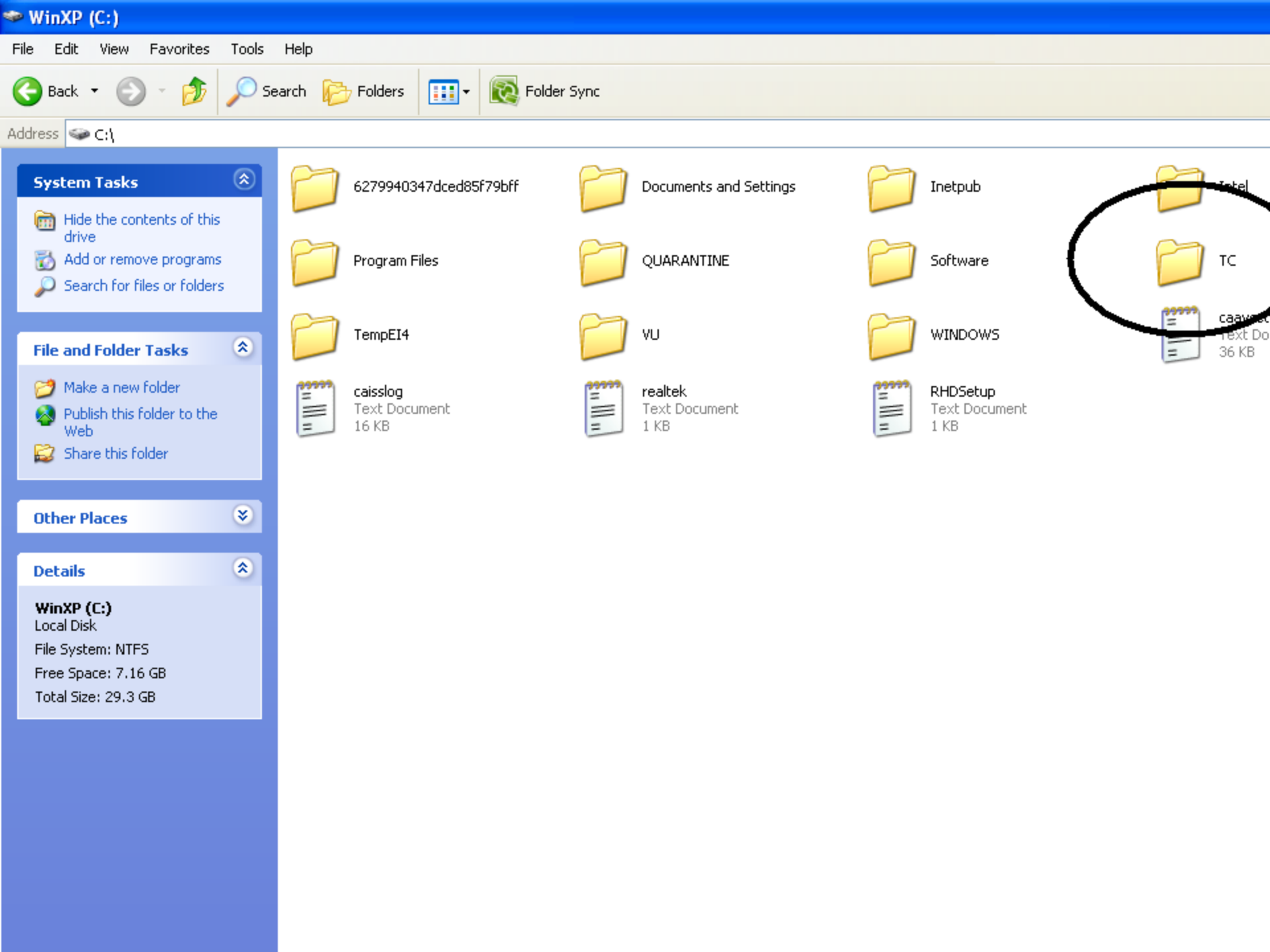



WinXP (C:)
File Edit View Favorites Tools Help
Back Search Folders Folder Sync
Address C:\
System Tasks
Hide the contents of this drive
Add or remove programs
Search for files or folders
File and Folder Tasks
Make a new folder
Publish this folder to the Web
Share this folder
Other Places
Details
WinXP (C:)
Local Disk
File System: NTFS
Free Space: 7.16 GB
Total Size: 29.3 GB
6279940347dced85f79bff
Documents and Settings
Inetpub
Program Files
QUARANTINE
Software
TC
TempEI4
VU
WINDOWS
caisslog
Text Document
16 KB
realtek
Text Document
1 KB
RHDSetup
Text Document
1 KB
36 KB

My first Program

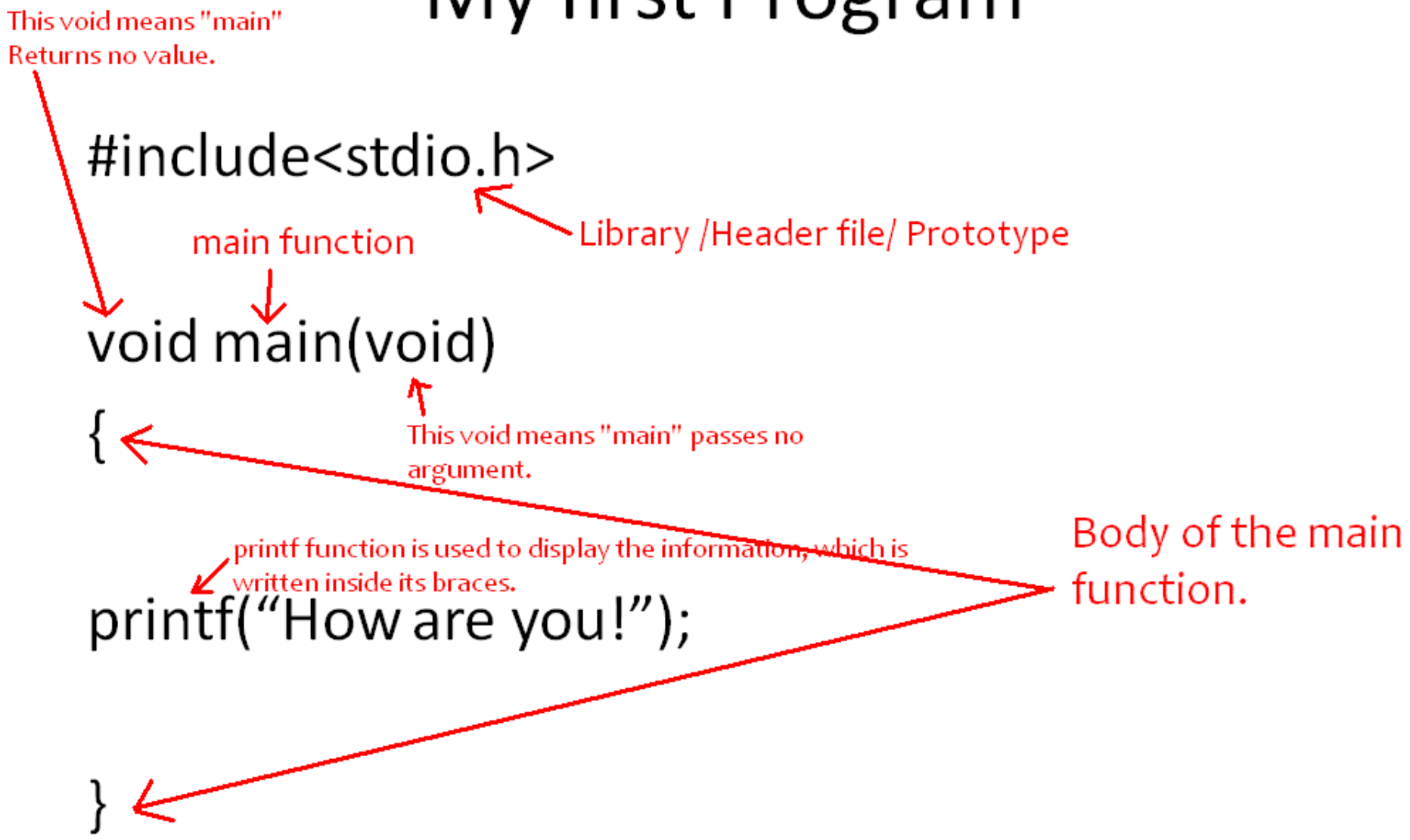
```
#include<stdio.h>

void main(void)
{

printf(“How are you!”);

}
```

My first Program



Output

How are you!

What is #include<stdio.h> ?

- Since we are using a function printf(); in our program in order to print a sentence, so it is necessary to give reference of this function.

- The functionality of printf(); function is defined somewhere in one of many C Standard Libraries, the name of that library is stdio.h.

- Hence including stdio.h at the top of our program become reference for printf function. We also call it prototype, or header file, since it is at the head of our program.

- stdio.h, which stands for "standard input/output header", is the header in the C standard library that contains macro definitions, constants, and declarations of functions and types used for various standard input and output operations.

What is void main(void)?

- C language is function oriented language. In this language we write programs through functions.

- C provides some built-in functions. We call it built-in, because functions can also be user defined, which we will learn later in this course.

- Hence main is one of the functions of C. Its name is main, because it is an important function, and must be used in a C program, whether you are using other functions or not.

What is void main(void)? Cont..

- Void which is written before main means that the function main will not return a value.
- How a value is Returned? You will learn this ahead in your course.
- Void which is written after main means that the function main will not send any argument.
- How arguments are sent/passed? This topic also is covered in coming topics.

More on main()….

- This is the entry point of a program
- When a file is executed, the start point is the main function
- From main function the flow goes as per the programmers choice.
- There may or may not be other functions written by user in a program
- Main function is compulsory for any c program

```
#include<stdio.h>
#include<conio.h>

void main(void)
{
printf(“How are you!”);
getch();
}
```

Explanation:

Note that, we have written an extra function:
“getch();”.

This function holds the output ”How are you” on the output window, till user presses any key. Getch stands for get character.

Getch() fucntion is the member of conio.h library, hence we include this library at the top of our program.

```
#include<stdio.h>
#include<conio.h>

void main(void)
{
clrscr();
printf(“How are you!”);
getch();
}
```

What is clrscr();?

- Clrscr(); is a fucntion used to clear the previous output from output window.

My second Program

```
#include<stdio.h>
#include<conio.h>

void main(void)
{
clrscr();
printf(“4 is a number”);
getch();
}
```

Output

4 is a number

```
#include<stdio.h>
#include<conio.h>

void main(void)
{
clrscr();
printf("4+4 is a number");
getch();
}
```

Output

4+4 is a number

Explanation:

Since we are writing a number inside the double quotes, it is treated as text, not a number. In order to treat numbers as numbers, we use format specifiers inside printf.

```
#include<stdio.h>
#include<conio.h>

void main(void)
{
clrscr();
printf(“%d is a number”,4);
getch();
}
```

```
#include<stdio.h>
#include<conio.h>

void main(void)
{
clrscr();
printf(“%d is a number”,4+4);
getch();
}
```

- %d is a format specifier, used to indicate integers.
- Integer is a Data Type, used to represent non decimal numbers.

Data types in C

- Primitive data types
  - int, float, double, char
- Aggregate data types
  - Arrays come under this category
  - Arrays can contain collection of int or float or char or double data
- User defined data types
  - Structures and enum fall under this category.

Variables

- Variables are data that will keep on changing
- Declaration

  <<Data type>> <<variable name>>;

  int a;
- Definition

  <<varname>>=<<value>>;

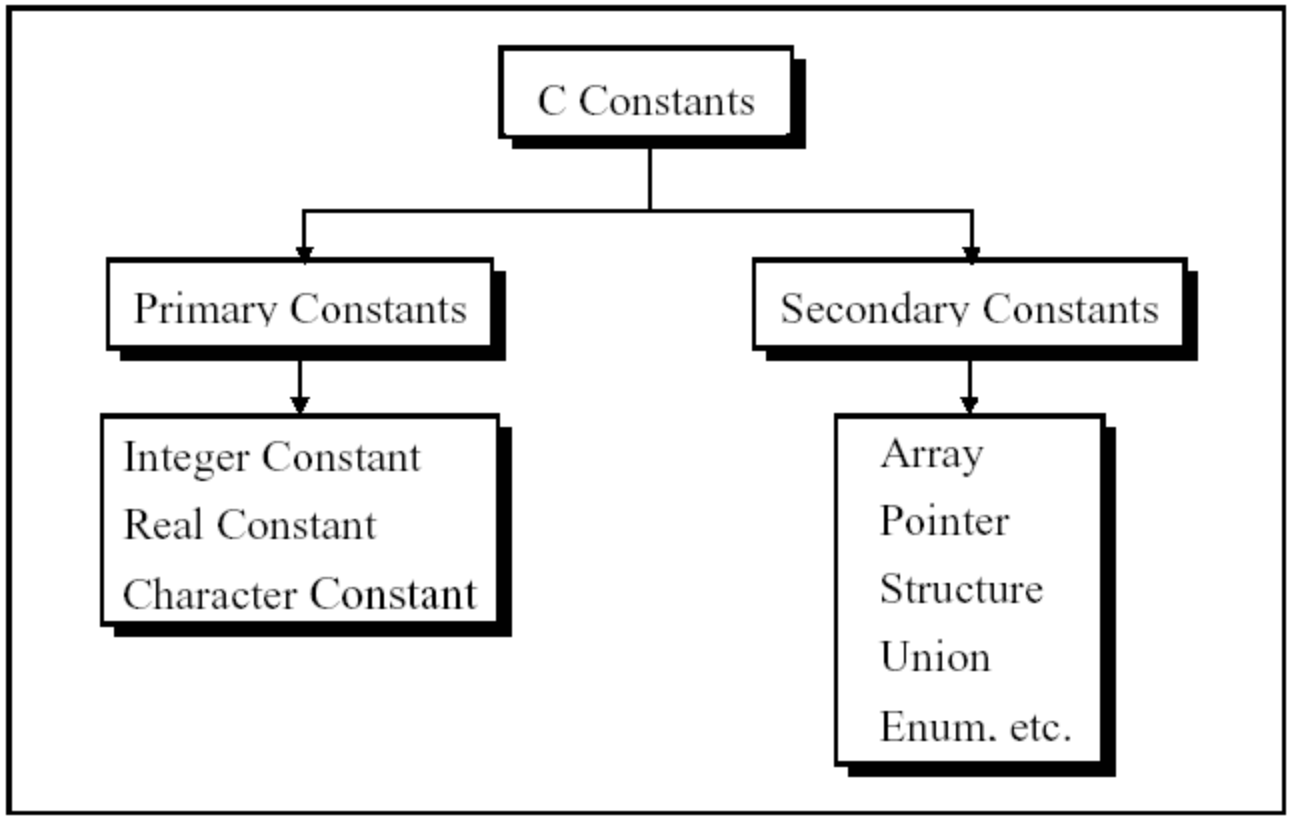
  a=10;
- Usage

  <<varname>>

  a=a+1; //increments the value of a by 1

Variable names- Rules

- Should not be a reserved word like int etc..
- Should start with a letter or an underscore(_)
- Can contain letters, numbers or underscore.
- No other special characters are allowed including space
- Variable names are case sensitive
  - A and a are different.


C Constants
Primary Constants
Secondary Constants
Integer Constant
Real Constant
Character Constant
Array
Pointer
Structure
Union
Enum. etc.

Rules for Constructing Integer Constants

- An integer constant must have at least one digit.
- It must not have a decimal point.
- It can be either positive or negative.
- If no sign precedes an integer constant it is assumed to be positive.
- No commas or blanks are allowed within an integer constant.
- The allowable range for integer constants is -32768 to 32767.

How we use an Integer in C Program

```
#include<stdio.h>
#include<conio.h>

void main(void)
{
clrscr();
int d;
d=84;
printf(“%d is a number”,d);
getch();
}
```

- A constant is quantity, that doesn’t change.

- A variable can be considered as a name given to the locationin memory, where this constant is stored.

d=84;

- In above instruction, d is a variable, and 84 is constant.

- We can use mathematical manipulations/ calculations with integers, some of the examples are given:

```
#include<stdio.h>
#include<conio.h>

void main(void)
{
clrscr();
int d;
d=84+2;
printf(“%d is a number”,d);
getch();
}
```

```
#include<stdio.h>
#include<conio.h>

void main(void)
{
clrscr();
int d;
d=84;
printf(“%d is a number”,d+2);
getch();
}
```

```
#include<stdio.h>
#include<conio.h>

void main(void)
{
clrscr();
int d=84;
printf(“%d is a number”,d);
getch();
}
```

```
#include<stdio.h>
#include<conio.h>

void main(void)
{
clrscr();
int d=84, e=50, f;
f=d+e;
printf(“%d is a number”,f);
getch();
}
```

```
#include<stdio.h>
#include<conio.h>

void main(void)
{
clrscr();
int d=84, e=50, f;
f=d-e;
printf(“%d is a number”,f);
getch();
}
```

```
#include<stdio.h>
#include<conio.h>

void main(void)
{
clrscr();
int d=84, e=50, f;
f=d/e;
printf(“%d is a number”,f);
getch();
}
```

```
#include<stdio.h>
#include<conio.h>

void main(void)
{
clrscr();
float d=84, e=50, f;
f=d/e;
printf("%f is a number",f);
getch();
}
```

Getting input from User

```
#include<stdio.h>
#include<conio.h>

void main(void)
{
clrscr();
int a;
printf(”Please type a number:”);
scanf(“%d”,&a);
printf(“You typed %d”, a );
getch();
}
```

```
#include<stdio.h>
#include<conio.h>

void main(void)
{
clrscr();
int a,b;
printf(”Please type two numbers:”);
scanf(“%d%d”,&a,&b);
printf(“You typed %d and %d”, a , b );
getch();
}
```

Task

- Write a Program, that gets input two numbers from user, and calculates their sum.