

Note: when working with other compilers like dev c++, visual studio code or code blocks or freeec etc we have to use `system("cls")` function to clear the screen contents, which belongs to `<stdlib.h>`

Identifier naming rules:

1. The name should have to start with alphabet or underscore [_] only.

Eg:

The screenshot shows a Turbo C++ IDE window titled "NONAME.C". The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The code editor contains the following C code:

```
Line 4 Col 6 Insert Indent Tab Fill Unindent * C:NONAME.C
#include<stdio.h>
void main()
{
int k1;
}
```

A "Compiling" dialog box is displayed in the center, showing the following information:

```
Compiling
Main file: NONAME.C
Compiling: EDITOR -> NONAME.C

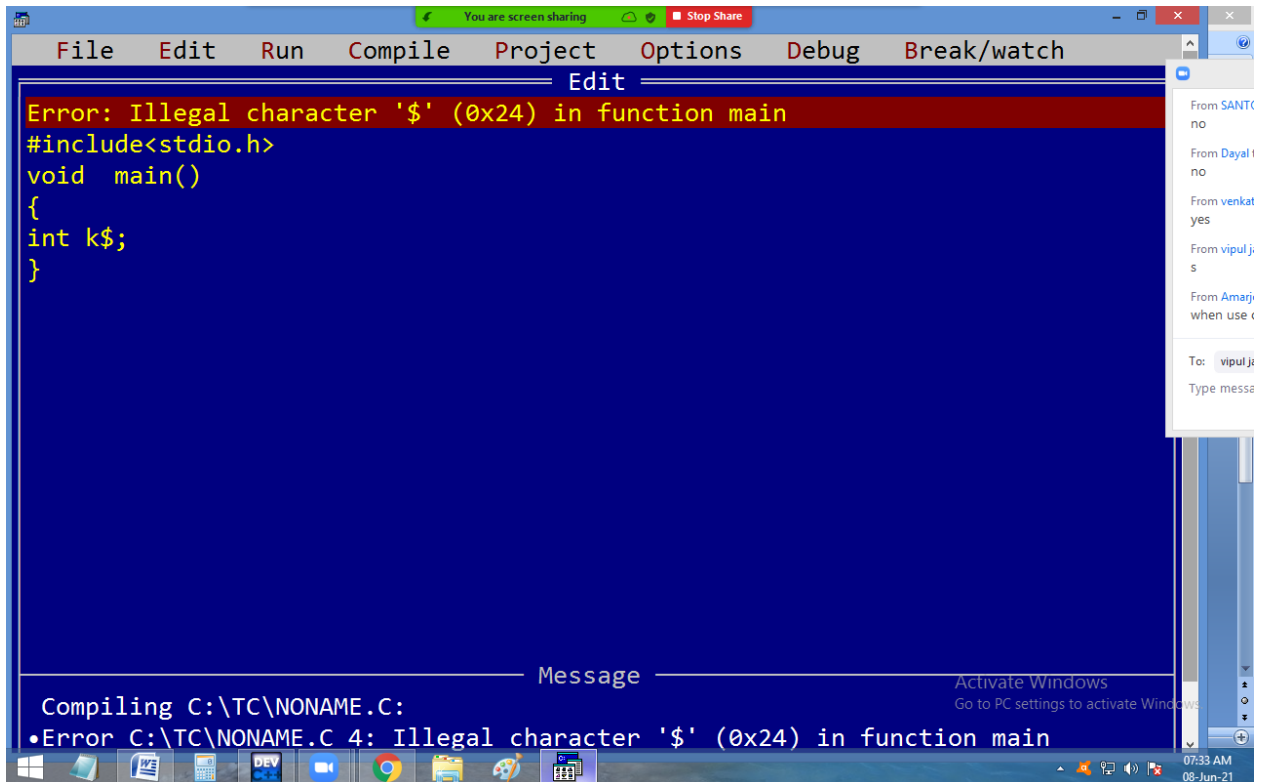
Total      File
Lines compiled: 217      217
Warnings: 0              0
Errors: 0                 0

Available memory: 250K
Success : Press any key
```

Below the dialog box, the "Watch" window is visible. The bottom status bar shows "Compiling C:\TC\NONAME.C:" and "Error C:\TC\NONAME.C 4: Declaration syntax error in function main". The taskbar at the bottom shows the Windows Start button and several application icons, including a web browser and a file explorer. The system clock in the bottom right corner indicates 07:31 AM on 08-Jun-21.

2. Numbers allowed but not at first position.

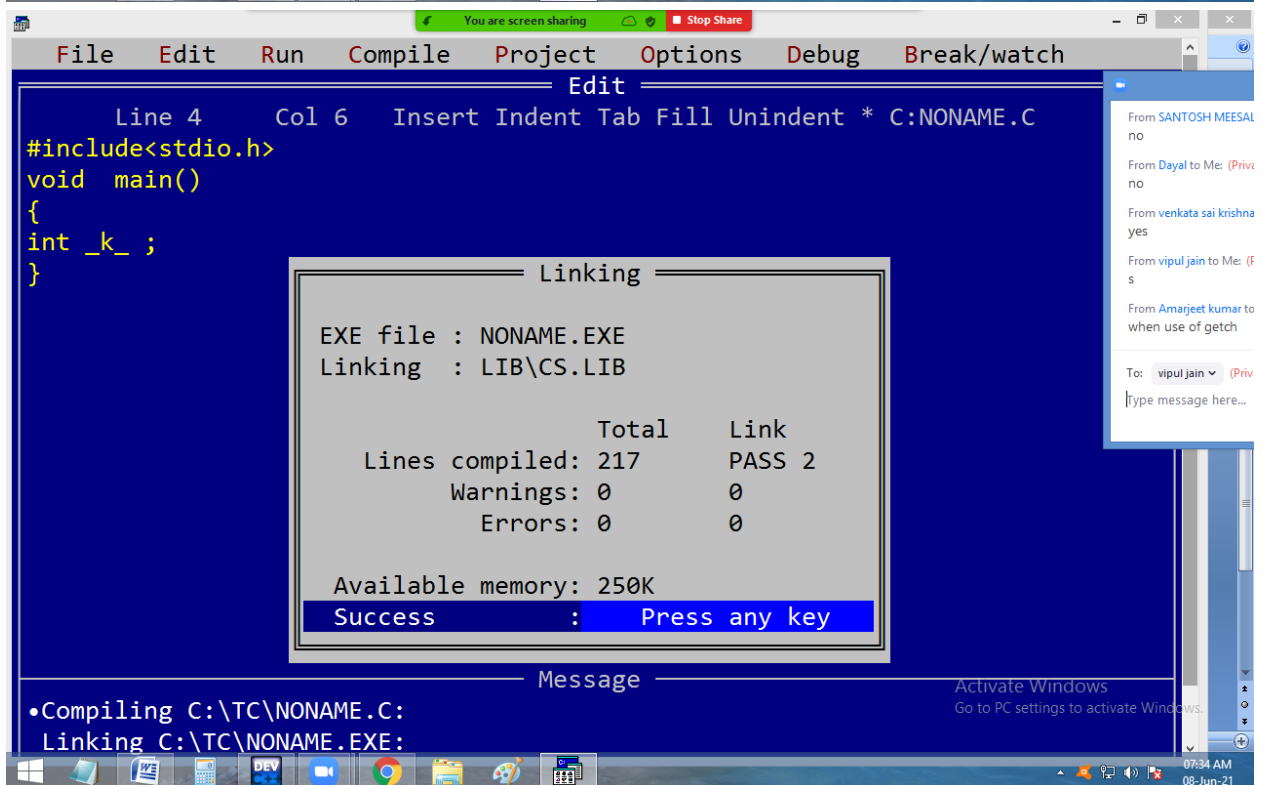
3. No special char except underscore.



The screenshot shows the Turbo C++ IDE with a menu bar (File, Edit, Run, Compile, Project, Options, Debug, Break/watch) and a toolbar. The main window displays a C program with a syntax error. A red error message banner at the top reads: "Error: Illegal character '\$' (0x24) in function main". The code in the editor is:

```
#include<stdio.h>
void main()
{
int k$;
}
```

Below the code, a message box says "Compiling C:\TC\NONAME.C:" followed by the error: "•Error C:\TC\NONAME.C 4: Illegal character '\$' (0x24) in function main". A Windows taskbar is visible at the bottom with the system clock showing 07:33 AM on 08-Jun-21. A chat window is open on the right side of the screen.



The screenshot shows the Turbo C++ IDE after successful compilation and linking. The main window displays the same C program, but the code on line 4 has been corrected to use an underscore: "int _k_ ;". A "Linking" dialog box is displayed in the center of the screen with the following information:

EXE file : NONAME.EXE
Linking : LIB\CS.LIB

	Total	Link
Lines compiled:	217	PASS 2
Warnings:	0	0
Errors:	0	0

Available memory: 250K
Success : Press any key

Below the dialog box, a message box says "•Compiling C:\TC\NONAME.C:" followed by "Linking C:\TC\NONAME.EXE:". The Windows taskbar at the bottom shows the system clock as 07:34 AM on 08-Jun-21. A chat window is also visible on the right.

4. Spaces not allowed.

```
File Edit Run Compile Project Options Debug Break/watch
Edit
Error: Declaration syntax error in function main
#include<stdio.h>
void main()
{
int a b_;
}

Compiling C:\TC\NONAME.C:
•Error C:\TC\NONAME.C 4: Declaration syntax error in function main
```

5. Keywords not allowed as identifiers.

```
File Edit Run Compile Project Options Debug Break/watch
Edit
Error: Declaration syntax error in function main
#include<stdio.h>
void main()
{
int do;
}

Compiling C:\TC\NONAME.C:
Error C:\TC\NONAME.C 4: Declaration syntax error in function main
```

6. Duplicate names not allowed.

This screenshot shows a C compiler window with a menu bar (File, Edit, Run, Compile, Project, Options, Debug, Break/watch) and a toolbar. The main editing area has a blue background and contains the following code:

```
Error: Redeclaration of 'a' in function main
#include<stdio.h>
void main()
{
int a;
int a;_
}
```

Below the code, a status bar indicates "Compiling C:\TC\NONAME.C:". On the right side, there is a chat window with a list of messages from various users, including Dayal, venkata sai krishna, vipul jain, and Amarjeet kumar. The bottom taskbar shows standard Windows icons and the system clock at 07:37 AM on 08-Jun-21.

This screenshot shows the same C compiler window as above, but with a different code snippet and a more detailed error message. The code is:

```
Error: Redeclaration of 'a' in function main
#include<stdio.h>
void main()
{
int a;
float a;_
}
```

The status bar now displays "Compiling C:\TC\NONAME.C:" followed by the error message: "•Error C:\TC\NONAME.C 5: Redeclaration of 'a' in function main". The chat window on the right is still visible, showing messages from Amarjeet kumar, vipul jain, Dayal, and Bhushan Patle. The system clock in the bottom right corner now shows 07:40 AM on 08-Jun-21.

7. Identifiers are case sensitive. i.e. lower and upper are different.

Line 5 Col 7 Insert Indent Tab Fill Unindent * C:NONAME.C

```
#include<stdio.h>
void main()
{
int a;
int A;
}
```

Compiling

Main file: NONAME.C
Compiling: EDITOR → NONAME.C

	Total	File
Lines compiled:	218	218
Warnings:	0	0
Errors:	0	0

Available memory: 250K
Success : Press any key

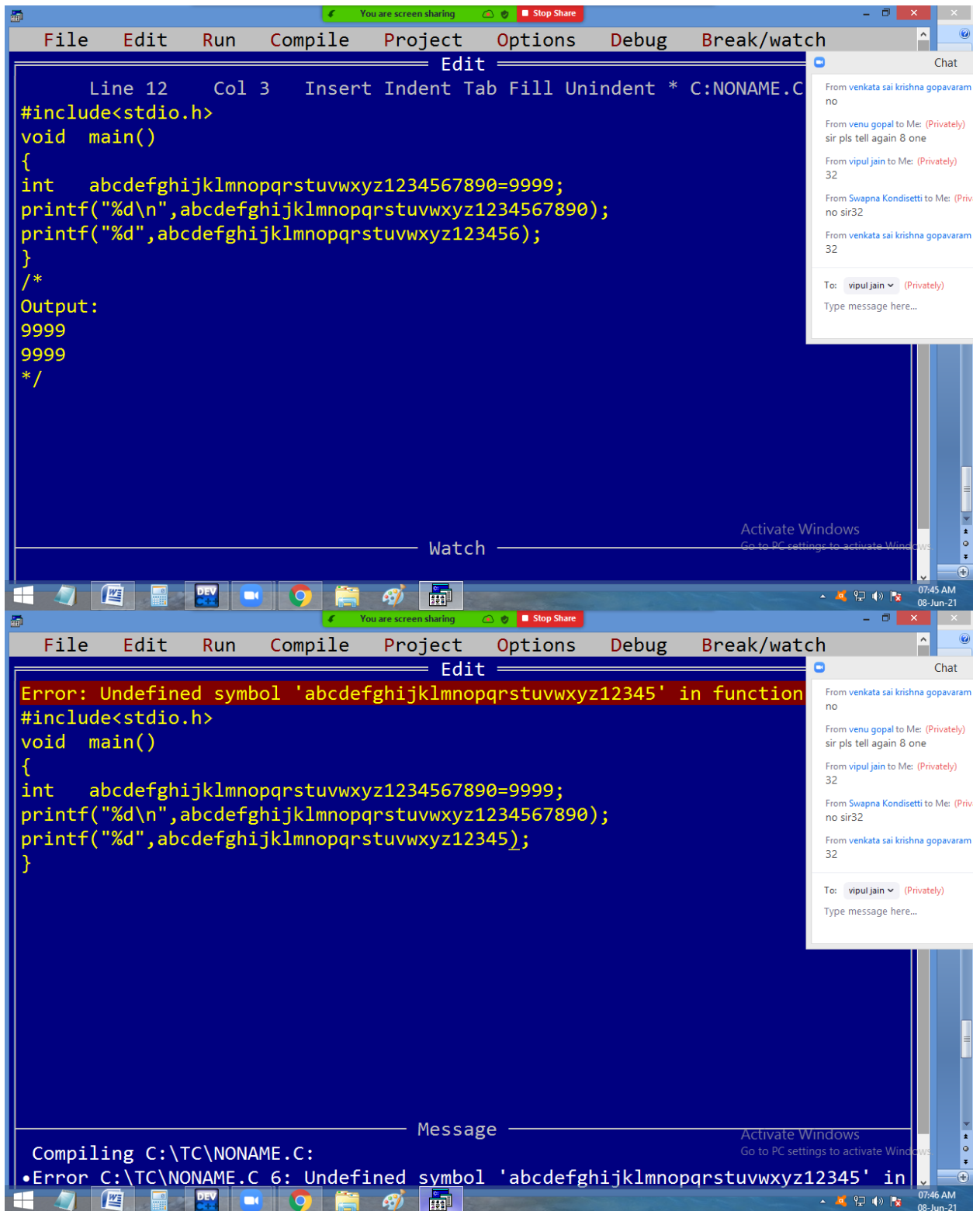
•Compiling C:\TC\NONAME.C:
Linking C:\TC\NONAME.EXE:

Message

Activate Windows
Go to PC settings to activate Windows

07:38 AM
08-Jun-21

8. Name may contain up to 32 characters and excess characters ignored by the compiler.



Constants: Fixed value and we can't change a constant value during program execution. Constant value should be provided at the time of declaration only. i.e. further initializations not allowed.

Eg:

Numerical constants:

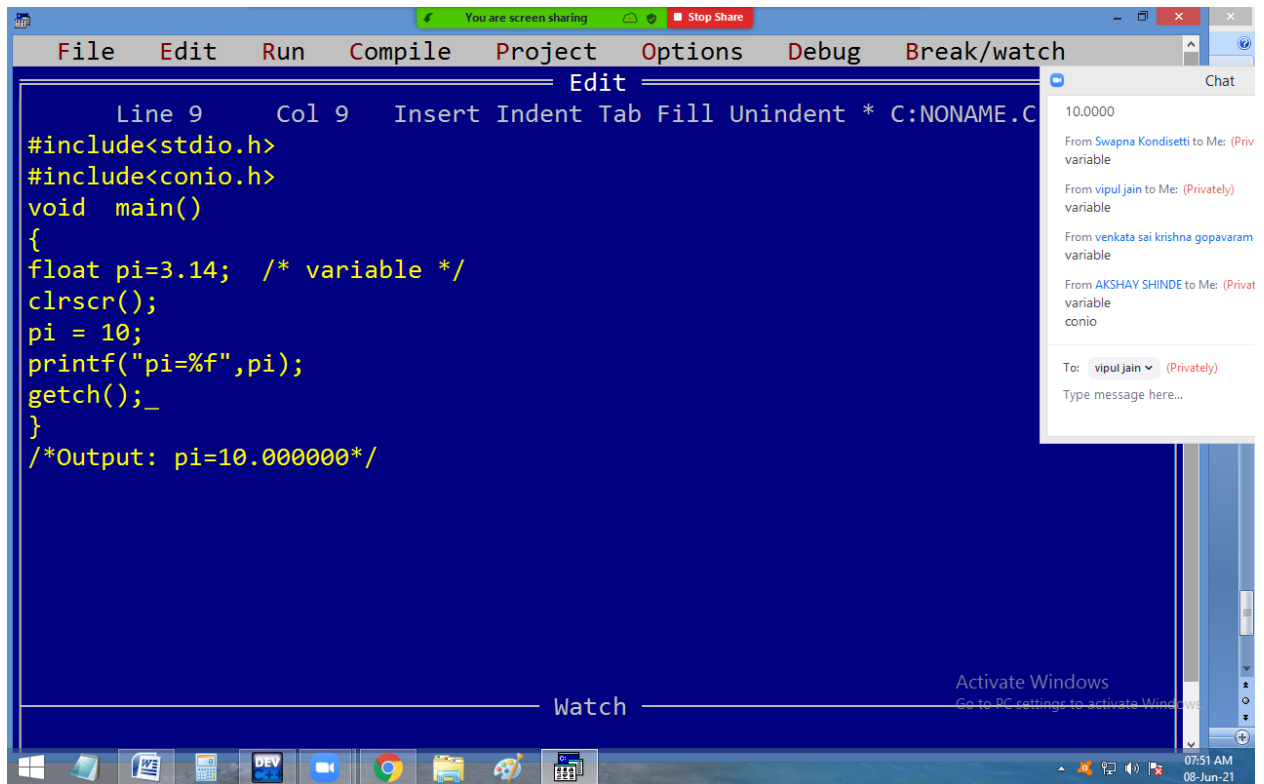
```
const float pi=3.14;
```

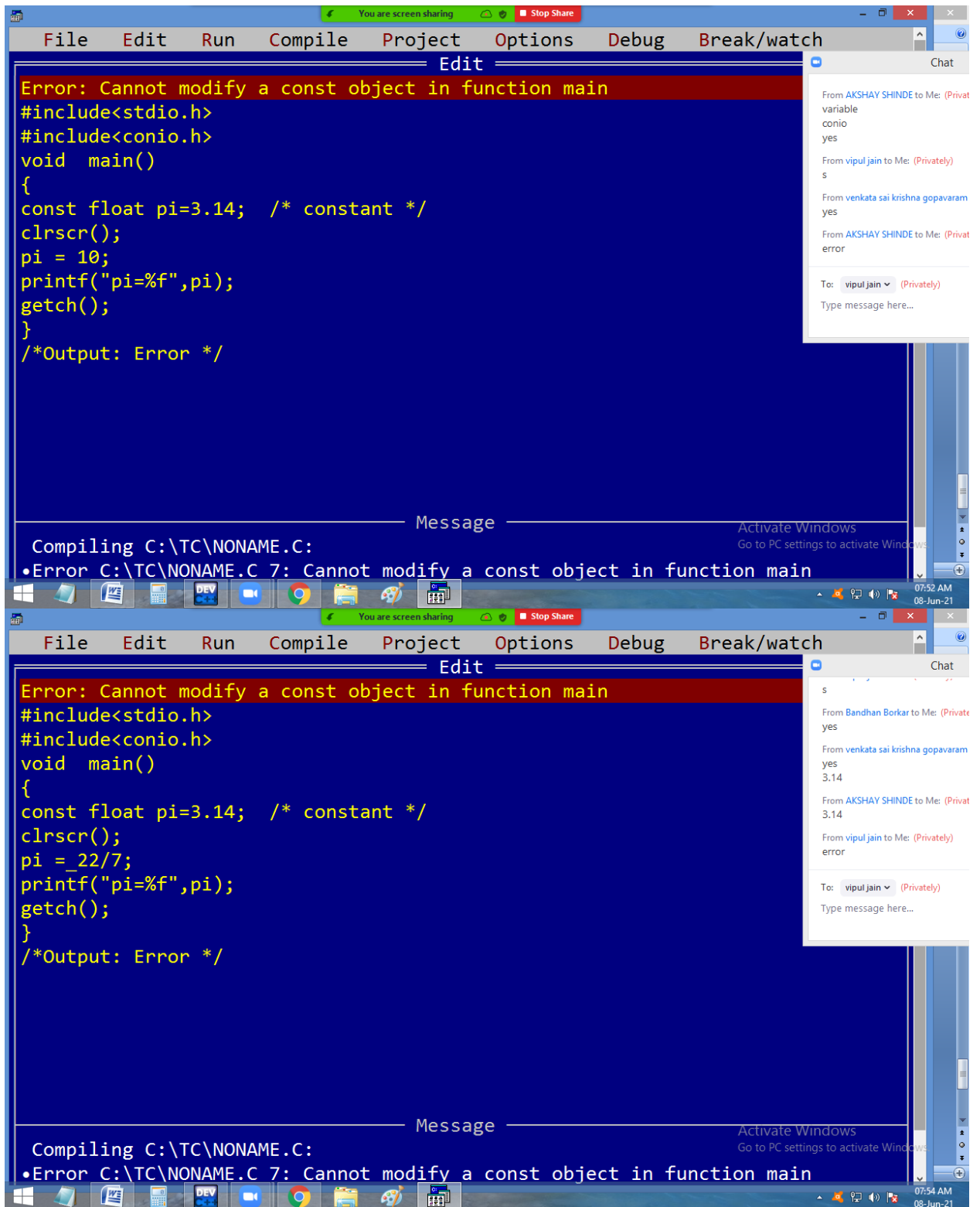
```
const int rollno=1234;
```

Character constants:

```
const char name[ ]="Ravi"; ➔ string
```

```
const char gender = 'M'; ➔ char
```



The screenshot shows a C program in a compiler window. The code defines a constant float `pi` and attempts to modify it in the `main` function. The compiler reports an error: "Error C:\TC\NONAME.C 7: Cannot modify a const object in function main". The code is as follows:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    const float pi; /* constant */
    clrscr();
    pi = _22/7;
    printf("pi=%f",pi);
    getch();
}
/*Output: Error */
```

The compiler output at the bottom shows the error message and a warning about the use of `pi` before its definition in the function.

```
Compiling C:\TC\NONAME.C:
•Error C:\TC\NONAME.C 7: Cannot modify a const object in function main
Warning C:\TC\NONAME.C 8: Possible use of 'pi' before definition in function
```

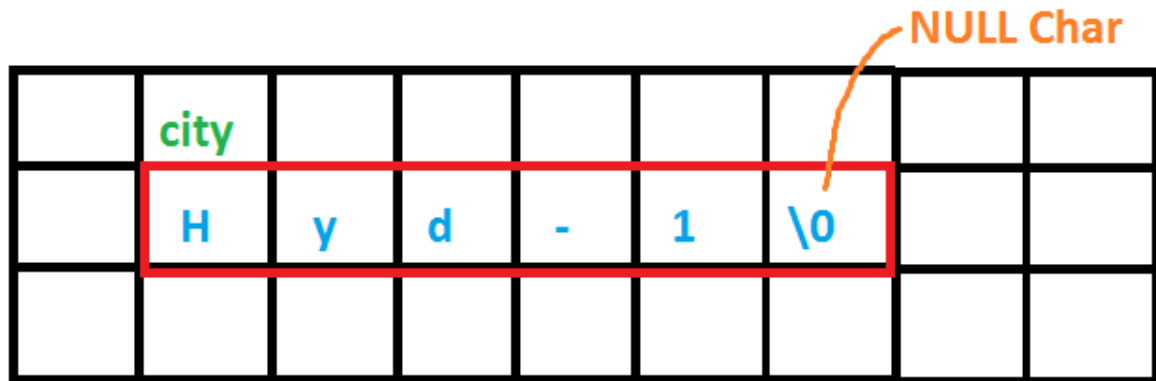
String:

A group of characters is called string.

It is alpha-numeric. i.e. it can store alphabets, numbers and special characters also.

Eg: `char city[]="Hyd-1";`

RAM - BYTES



Note:

1. One byte should be left for '\0'. Otherwise we are getting garbage.

A screenshot of a code editor window titled 'C:\NONAME.C'. The editor shows the following C code:

```
Line 9 Col 20 Insert Indent Tab Fill Unindent * C:\NONAME.C
#include<stdio.h>
#include<conio.h>
void main()
{
char city[ ] = "Hyd-1";
printf(city);
getch();
}
/* Output: Hyd-1 */_
```

The editor has a menu bar with 'File', 'Edit', 'Run', 'Compile', 'Project', 'Options', 'Debug', and 'Break/watch'. A status bar at the bottom shows 'Watch' and 'Activate Windows'. A chat window on the right side of the editor shows messages from various users.

You are screen sharing Stop Share

File Edit Run Compile Project Options Debug Break/watch

Edit

Line 7 Col 13 Insert Indent Tab Fill Unindent * C:NONAME.C

```
#include<stdio.h>
#include<conio.h>
void main()
{
char city[ ] = "Hyd-1";
printf("%s",city);
getch();
}
/* Output: Hyd-1 */
```

Watch

Activate Windows
Go to PC settings to activate Windows

08:17 AM
08-Jun-21

chat window:

- null
- From AKSHAY SHIND no
- From venkata sai krist no
- From Swapna Kondisi no s
- From vipul jain To Me s

To: vipul jain (P)
Type message here.

You are screen sharing Stop Share

File Edit Run Compile Project Options Debug Break/watch

Edit

Line 5 Col 13 Insert Indent Tab Fill Unindent * C:NONAME.C

```
#include<stdio.h>
#include<conio.h>
void main()
{
char city[6] = "Hyd-1";
printf("%s",city);
getch();
}
/* Output: Hyd-1 */
```

Watch

Activate Windows
Go to PC settings to activate Windows

08:18 AM
08-Jun-21

chat window:

- null
- From AKSHAY SHIND no
- From venkata sai krist no
- From Swapna Kondisi no s
- From vipul jain To Me s

To: vipul jain (P)
Type message here.

The screenshot shows a Turbo C++ IDE with a C program in a file named C:\NONAME.C. The code is as follows:

```
Line 9 Col 24 Insert Indent Tab Fill Unindent * C:\NONAME.C
#include<stdio.h>
#include<conio.h>
void main()
{
char city[5] = "Hyd-1";
printf("%s",city);
getch();
}
/* Output: Hyd-1Garbage_*/
```

The IDE has a menu bar with File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. A status bar at the bottom shows the Windows taskbar with various icons and the system clock at 08:19 AM on 08-Jun-21. A chat window on the right shows messages from several users.

2. String variable size never smaller than the string.

The screenshot shows the same Turbo C++ IDE, but now with a compilation error. The code is as follows:

```
Error: Too many initializers in function main
#include<stdio.h>
#include<conio.h>
void main()
{
char city[4] = "Hyd-1";
printf("%s",city);
getch();
}
/* Output: Error*/
```

The error message "Error: Too many initializers in function main" is displayed in a red box at the top of the code editor. The IDE's status bar at the bottom shows the compilation message: "Compiling C:\TC\NONAME.C: •Error C:\TC\NONAME.C 5: Too many initializers in function main". The system clock at the bottom right shows 08:20 AM on 08-Jun-21.

3. We can't copy a string using = operator. For this we have to use strcpy() available in <string.h>

```
int a; /* variable declaration */
```

```
a=100; /* initialization */
```

```
char city[10];
```

```
city="Hyd-1"; ➔ error
```

You are screen sharing

Stop Share

File Edit Run Compile Project Options Debug Break, Chat

Edit

Error: Lvalue required in function main

```
#include<stdio.h>
#include<conio.h>
void main()
{
char city[10];
city = "Hyd-1";
printf(city);
getch();
}
/* Output: Error*/
```

Message

Compiling C:\TC\NONAME.C:
•Error C:\TC\NONAME.C 6: Lvalue required in function main

Activate Windows
Go to PC settings to activate Windows

08:24 AM
08-Jun-21

Chat

5

From Kaushik Morayya to Me: (Privately)
yed

From vipul jain to Me: (Privately)
s

From Kaushik Morayya to Me: (Privately)
yes
yes

From Prasad Chaganti to Me: (Privately)
string value given 8 ..is a problem sir...

To: vipul jain (Privately)

Type message here...

File Edit

Mute Start Video Security Participants 43 New Share Pause Share More Break/watch

You are screen sharing

Stop Share

Edit

Line 11 Col 17 Insert Indent Tab Fill Unindent * C:\NONAME.C

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
void main()
{
char city[10];
strcpy(city,"Hyd-1");
printf(city);
getch();
}
/* Output: Hyd-1*/
```

Watch

Activate Windows
Go to PC settings to activate Windows

08:25 AM
08-Jun-21

Chat

yes
yes

From Prasad Chaga
string value given

From venkata sai kr
yes

From SANTOSH M
yes sir

From vipul jain to h
s

To: vipul jain

Type message here

4. We can't compare two strings using == operator.
For this we have to use strcmp() available in
string.h

Eg:

You are screen sharing Stop Share

File Edit Run Compile Project Options Debug Break/watch

Edit

Line 10 Col 17 Insert Indent Tab Fill Unindent * C:\NONAME.C

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
if(10==10)printf("Equal");
else printf("Not equal");
getch();
}
/* Output: Equal*/
```

Watch

Activate Windows
Go to PC settings to activate Windows

08:27 AM
08-Jun-21

From vipul jain to h
equal
From AKSHAY SHIP
int
From Prasad Chaga
int
From laxmi madhui
int
From vipul jain to h
int
To: vipul jain
Type message here

You are screen sharing Stop Share

File Edit Run Compile Project Options Debug Break/watch

Edit

Line 7 Col 17 Insert Indent Tab Fill Unindent * C:\NONAME.C

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
if(10.2==10.2)printf("Equal");
else printf("Not equal");
getch();
}
/* Output: Equal*/
```

Message

Compiling C:\TC\NONAME.C:
•Warning C:\TC\NONAME.C 7: Unreachable code in function main

Activate Windows
Go to PC settings to activate Windows

08:27 AM
08-Jun-21

From venkata sai kr
float
From AKSHAY SHIP
float
From Swapna Kond
float
From Prasad Chaga
float
From laxmi madhui
float
To: vipul jain
Type message here

You are screen sharing Stop Share

File Edit Run Compile Project Options Debug Break/watch

Edit

Line 10 Col 16 Insert Indent Tab Fill Unindent * C:NONAME.C

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
if("abc"=="abc")printf("Equal");
else printf("Not equal");
getch();
}
/* Output: Not Equal*/
```

Watch

Activate Windows
Go to PC settings to activate Windows

08:28 AM
08-Jun-21

- float
- From AKSHAY SHIP
yes
- From venkata sai kr
yes
not
- From AKSHAY SHIP
not
- From Prasad Chaga
not allowed
- To: vipul jain
- Type message here

You are screen sharing Stop Share

File Edit Run Compile Project Options Debug Break/watch

Edit

Line 11 Col 12 Insert Indent Tab Fill Unindent * C:NONAME.C

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
void main()
{
clrscr();
if(strcmp("abc","abc")==0)printf("Equal");
else printf("Not equal");
getch();
}
/* Output: Equal*/
```

Watch

Activate Windows
Go to PC settings to activate Windows

08:31 AM
08-Jun-21

- From AKSHAY SHIP
yes
- From SANTOSH MI
sir
- From Vishal Tanaji
dr
- From Swarna Sreera
yes
- From Pavan kumar
yes sirr
- To: vipul jain
- Type message here

DATA TYPES

Data type determines the type of value we are going to store in our computer. To store anything in our computer, we should have to allocate the memory. This memory allocation is depended on the data type we are using.

Data type determines the properties such as

1. No of bytes
2. Range
3. Type of value
4. Conversion character etc of.

In C language we are having 3 **basic** data types

1. **Int → non decimal numbers**
2. **Float → decimal numbers**
3. **Char → alpha-numeric**

Total data types are divided into 3 types.

1. **Primitive data types**
2. **Derived data types**
3. **User defined data types**

PRIMITIVE DATA TYPES:

These are the regular data types we are using in our c programs.

Data type	Bytes	Conversion Character / format specifier	Range
int / signed int / short int	2	%d	-32768 to +32767
unsigned int	2	%u	0 to 65535
long int	4	%ld	-2147483648 to 2147483647
unsigned long int	4	%lu	0 to 4294967295
float	4	%f	$3.4 * 10^{-38}$ to $3.4 * 10^{+38}$
double	8	%lf	$1.7 * 10^{-308}$ to $1.7 * 10^{+308}$
long double	10	%Lf	$3.4 * 10^{-4932}$ to $1.1 * 10^{+4932}$
Char ASCII set	1	%c	1 character Signed char [-128 to +127] Unsigned char [0 to 255]
char[10] (STRING)	10	%s	9 char + 1 null char
void [empty data type]			nothing

Note: In 16 bit dos based compilers like turbo c, turbo c++ int is taking 2 bytes memory only. But windows based compilers & gcc compilers take 4 bytes for int.

DERIVED DATA TYPES:

They are derived from primitive data types.

- 1. Array**
- 2. Pointer**
- 3. Function**

USER DEFINED DATA TYPES:

These are the data types created by the user.

1. structure
2. union
3. enum