

## Documentation of Day 2 Practice

### Exercise 1-1:

Leaving out different parts of HelloWorld program and see what error message the compiler gives:

Here I did not complete the escape sequence in the printf function that is why the compiler gives an error saying that "missing terminating character".

The screenshot shows a C compiler interface with a file named `HelloWorld.c`. The code is as follows:

```
1 #include <stdio.h>
2 #include <stdlib.h>
3 int main() {
4     printf("Hello World\");
5     return 0;
6 }
```

The line `printf("Hello World\");` is highlighted in red, indicating an error. The error messages are listed in the bottom panel:

Line	Col	File	Message
		D:\Chapterwise C Projects\Day_1\HelloWorld.c	In function 'main':
4	9	D:\Chapterwise C Projects\Day_1\HelloWorld.c	[Warning] missing terminating " character
4	2	D:\Chapterwise C Projects\Day_1\HelloWorld.c	[Error] missing terminating " character
5	2	D:\Chapterwise C Projects\Day_1\HelloWorld.c	[Error] expected expression before 'return'
6	1	D:\Chapterwise C Projects\Day_1\HelloWorld.c	[Error] expected ';' before '}' token

Here I do not give any semicolon in line 4. In C programming a semicolon indicates end of a statement and it is mandatory. If we do not give it after a statement the compiler will give a syntax error message which is “expected ‘;’ before .....”. Here in the empty space there will be the indication of next statement of the program before which the semicolon should be given.

```
1 #include <stdio.h>
2 #include <stdlib.h>
3 int main() {
4     printf("Hello World\n")
5     return 0;
6 }
```

Line	Col	File	Message
		D:\Chapterwise C Projects\Day_1\HelloWorld.c	In function 'main':
5	2	D:\Chapterwise C Projects\Day_1\HelloWorld.c	[Error] expected ';' before 'return'

In the below snapshot we can see that there is an error displaying that “incompatible implicit declaration of built-in function printf”.

Reason of this error: The reason of this error is that we have used a built-in function which is printf function which is a built-in function of the built-in headerfile “stdio.h”. In C language if we use any built-in function of any header file we must have to include the header file in the very beginning of the program. I did not include any header file in this program and for this reason the compiler give a warning message.

The screenshot shows a code editor with a C program. The program is a simple 'Hello World' program that uses the printf function. The code is as follows:

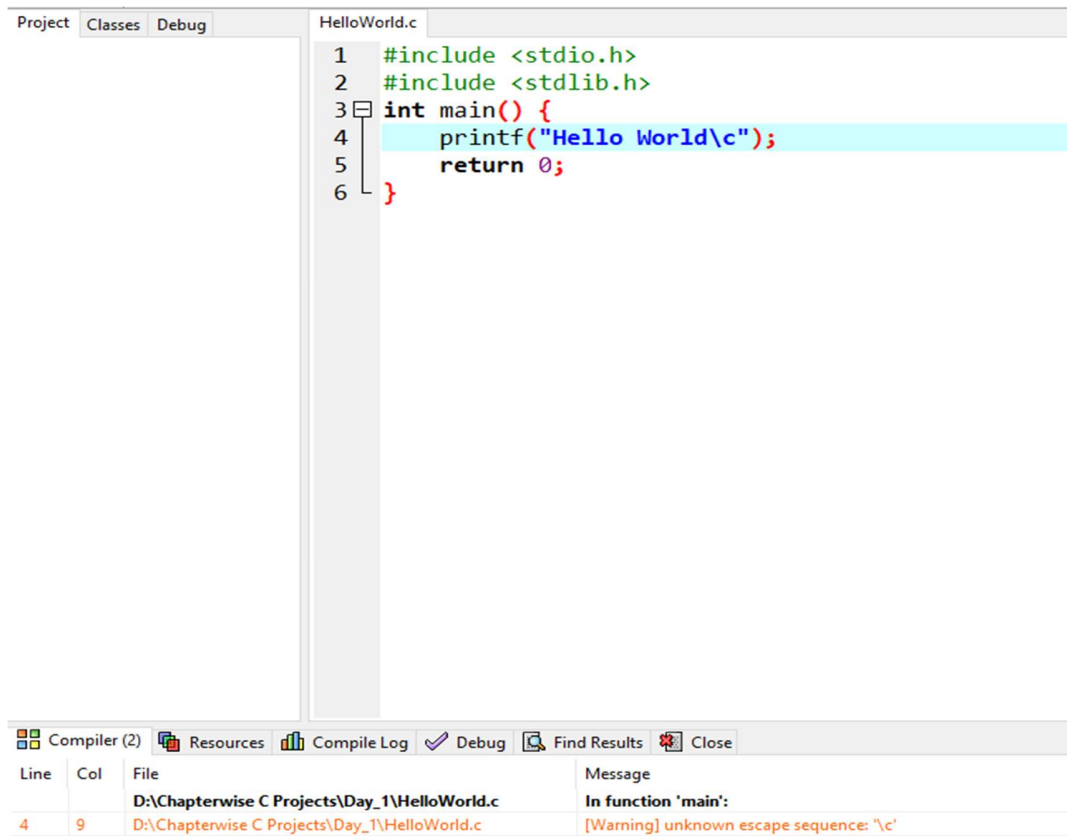
```
1
2  /* ***** */
3  /* FUNCTION NAME : main */
4  /*
5  /* INPUTS      : 1. argc -- the number of parameters provided to the main function */
6  /*              2. argv -- the pointer to the input string array of parameters */
7  /*
8  /* RETURN      : = 0 -- Success */
9  /*              : < 0 -- Failed */
10 /*
11 /* NOTES       : Experiment with leaving out parts of the program to see what error messages we get */
12 /* ***** */
13 int main(int argc, char *argv[]) {
14     printf("Hello World\n");
15     return 0;
16 }
```

The code is compiled, and a warning message is displayed at the bottom of the editor. The warning message is:

```
Line Col File Message
14 2 D:\Repository\Training\MdNazmulHassan\C&DS\Day_2\... In function 'main':
[Warning] incompatible implicit declaration of built-in function 'printf'
```

## Exercise 1-2:

Here I gave an invalid escape sequence “\c”. That is why the compiler gives an warning message saying “unknown escape sequence: \c”.



The screenshot shows a C compiler IDE with a project named 'HelloWorld.c'. The code in the editor is as follows:

```
1 #include <stdio.h>
2 #include <stdlib.h>
3 int main() {
4     printf("Hello World\c");
5     return 0;
6 }
```

The line containing the printf statement is highlighted in light blue. At the bottom of the IDE, a warning message is displayed:

Line	Col	File	Message
4	9	D:\Chapterwise C Projects\Day_1\HelloWorld.c	In function 'main': [Warning] unknown escape sequence: '\c'

As the escape sequence is not valid the program will treat the \c as character c and will print it with “Hello World”.

```
D:\Chapterwise C Projects\Day_1\HelloWorld.exe
Hello Worldc
-----
Process exited after 0.02774 seconds with return value 0
Press any key to continue . . .
```

### **Exercise 1-3:**

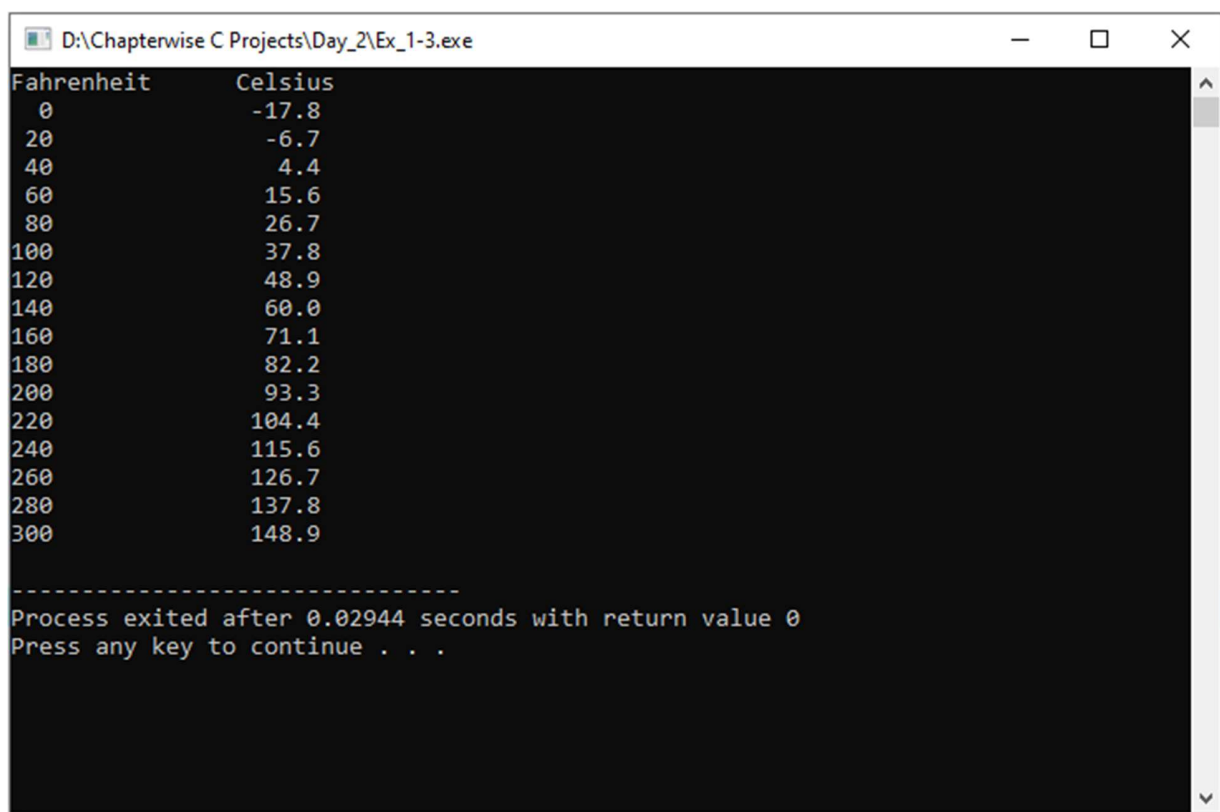
This program uses the formula  $C = (5/9)(F - 32)$  to print the following table of Fahrenheit temperatures and their centigrade or Celsius equivalents:

```
Project Classes Debug Ex_1-3.c Ex_1-4.c
1  /* print Fahrenheit-Celsius table
2  for fahr = 0, 20, ..., 300 */
3
4  #include <stdio.h>
5  int main() {
6      float fahr, celsius;
7      float lower, upper, step;
8
9      lower = 0; /* lower limit of temperature scale */
10     upper = 300; /* upper limit */
11     step = 20; /* step size */
12
13     fahr = lower;
14     printf("Fahrenheit\tCelsius\n");
15     while (fahr <= upper) {
16         celsius = (5.0/9.0) * (fahr-32.0);
17         printf("%3.0f\t\t%6.1f\n", fahr, celsius);
18         fahr = fahr + step;
19     }
20     return 0;
21 }
22
```

## Steps:

- i) At first take two variables fahr and Celsius to store the value of fahrenheit and Celsius.
- ii) After that declare three variables to set the lower, upper limit of the temperature scale and set the increment step.
- iii) Then assign the lower value in fahr variable.
- iv) Then print the header of the table.
- v) Then run a while loop and the loop will run until the fahr is less than or equal to upper scale of the temperature.
- vi) Then inside the loop the conversion formula from Fahrenheit to Celsius is written and the table is printed.
- vii) At last just increment the fahr with the step value.
- viii) The while loop will run until the value of fahr crossed the temperature scale limit and thus all the value of Celsius corresponding to the Fahrenheit value will be printed as form of a table. The output is shown in next snapshot.

## Output:



```
D:\Chapterwise C Projects\Day_2\Ex_1-3.exe
Fahrenheit    Celsius
0             -17.8
20            -6.7
40             4.4
60            15.6
80            26.7
100           37.8
120           48.9
140           60.0
160           71.1
180           82.2
200           93.3
220          104.4
240          115.6
260          126.7
280          137.8
300          148.9

-----
Process exited after 0.02944 seconds with return value 0
Press any key to continue . . .
```

### **Exercise 1-4:**

This program uses the formula  $F = (9/5) * (C + 32)$  to print the corresponding Celsius to Fahrenheit table.:

This is the Snapshot of the driver source code:

```
// Print Celsius-Fahrenheit table
// for celsius = 0, 20, ... 300
// floating point version

#include <stdio.h>
int main(void) {
    float celsius, fahr;
    float lower, upper, step;

    lower = 0;
    upper = 300;
    step = 20;

    celsius = lower;
    printf("Celsius\tFahrenheit\n");
    while (celsius <= upper) {
        fahr = (9.0 / 5.0) * celsius + 32.0f;
        printf("%3.0f\t%6.1f\n", celsius, fahr);
        celsius = celsius + step;
    }
    return 0;
}
```

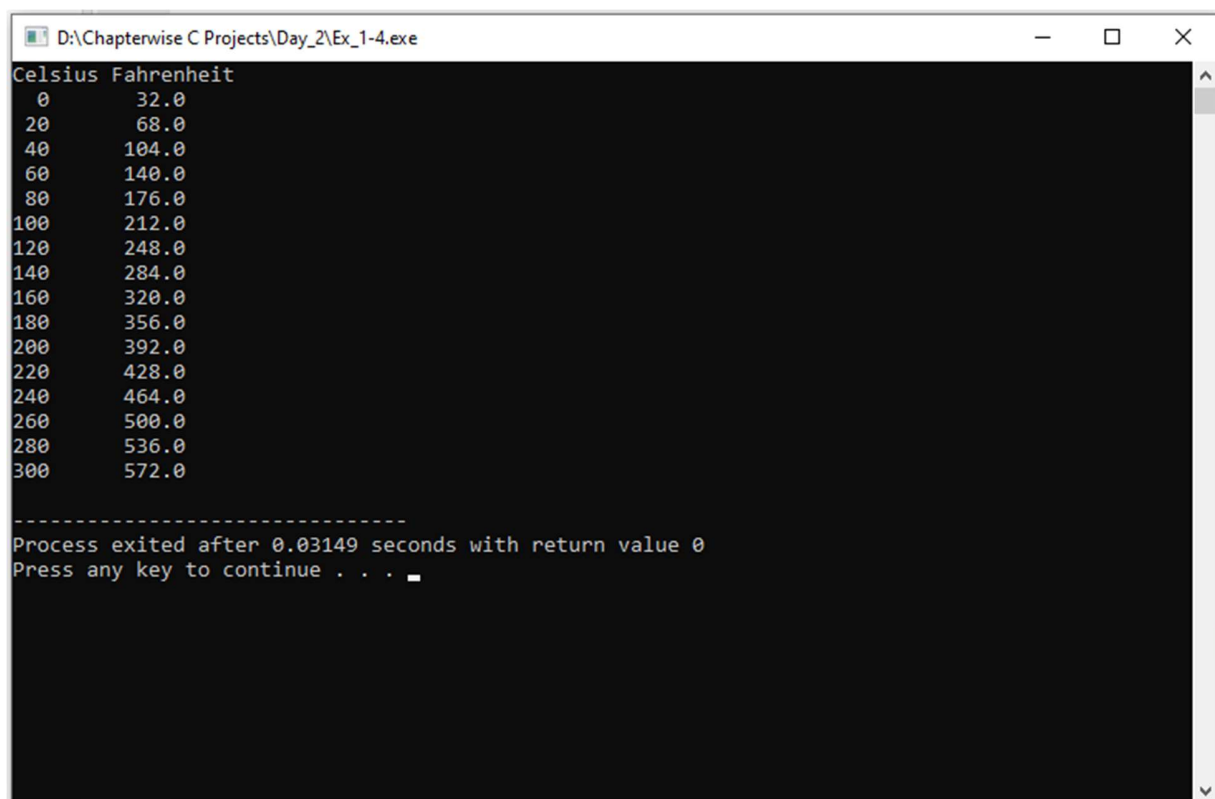
Steps:

- i) At first take two variables celsius and fahr to store the value of Celsius and Fahrenheit.
- ii) After that declare three variables to set the lower, upper limit of the temperature scale and set the increment step.
- iii) Then assign the lower value in celsius variable.
- iv) Then print the header of the table.

- v) Then run a while loop and the loop will run until the celsius is less than or equal to upper scale of the temperature.
- vi) Then inside the loop the conversion formula from Celsius to Fahrenheit is written and the table is printed.
- vii) At last just increment the celsius with the step value.

The while loop will run until the value of celsius crossed the temperature scale limit and thus all the value of Fahrenheit corresponding to its Celsius value will be printed as form of a table. The output is shown in next snapshot.

### **Output:**



```
D:\Chapterwise C Projects\Day_2\Ex_1-4.exe
Celsius Fahrenheit
0      32.0
20     68.0
40    104.0
60    140.0
80    176.0
100   212.0
120   248.0
140   284.0
160   320.0
180   356.0
200   392.0
220   428.0
240   464.0
260   500.0
280   536.0
300   572.0

-----
Process exited after 0.03149 seconds with return value 0
Press any key to continue . . .
```