

PRACTICAL NO:-4

Aim:- To explain compile time errors and runtime errors.

1. Compile Time Errors

- These errors occur when the program is being compiled.
- The compiler detects these errors before the program is executed.
- Common examples include:
- Syntax errors
- Missing semicolons
- Undeclared variables
- Type mismatches
- Missing brackets, etc.
- The program does not run until all compile time errors are corrected.

2. Run Time Errors

- These errors occur while the program is running (after successful compilation).
- They are usually caused by:
- Invalid input
- Division by zero
- File handling issues
- Memory-related issues
- The program may compile successfully but can crash during execution due to runtime errors.

Example of Compile Time Error

- CODE :-

The screenshot shows a code editor window with a dark theme. The title bar says "Welcome" and "C Abhishek.c 1". The code editor pane contains the following C code:

```
C Abhishek.c > main()
1 #include <stdio.h>
2
3 int main() {
4     int x = 10;
5     printf("Value of x: %d" x); // Missing comma between format string and variable
6     return 0;
7 }
```

The line "printf("Value of x: %d" x);" has a red underline under the variable "x", indicating a syntax error. The error message "Missing comma between format string and variable" is displayed below the code.

- OUTPUT :-

The screenshot shows a terminal window with a dark theme. The tab bar includes "PROBLEMS 1", "OUTPUT", "DEBUG CONSOLE", "TERMINAL", and "PORTS". The "TERMINAL" tab is active. The terminal output shows the following command and its result:

```
PS C:\Users\Abhishek\OneDrive\Desktop\Assignment C Programming> cd "c:\Users\Abhishek\OneDrive\Desktop\Assignment C Programming" ; if ($?) { gcc Abhishek.c -o Abhishek } ; if ($?) { .\Abhishek }
Abhishek.c: In function 'main':
Abhishek.c:5:29: error: expected ')' before 'x'
    printf("Value of x: %d" x); // Missing comma between format string and variable
                                ^
PS C:\Users\Abhishek\OneDrive\Desktop\Assignment C Programming>
```

The terminal shows a syntax error at line 5, column 29, indicating an expected ')' before 'x'. This corresponds to the error shown in the code editor.

- Explanation: - The error occurs because the printf statement is written incorrectly. Since the syntax is wrong, the compiler stops and refuses to generate an executable program.

Example of Run Time Error

- CODE :-

The screenshot shows a code editor window with a dark theme. The tab bar at the top has 'Welcome' and 'C Abhishek.c X'. The code editor area displays the following C code:

```
C Abhishek.c > main()
1 #include <stdio.h>
2
3 int main() {
4     int numerator = 10;
5     int denominator = 0;
6     int result = numerator / denominator; // Division by zero
7     printf("Result: %d\n", result);
8     return 0;
9 }
```

The code attempts to divide the integer 10 by zero, which is a runtime error. The code editor interface includes standard icons for file operations like save, close, and settings.

- OUTPUT :-

The screenshot shows a terminal window with a dark theme. The tabs at the top are 'PROBLEMS', 'OUTPUT', 'DEBUG CONSOLE', 'TERMINAL', and 'PORTS'. The 'TERMINAL' tab is active. The terminal output is as follows:

```
PS C:\Users\Abhishek\OneDrive\Desktop\Assignment C Programming> cd "c:\Users\Abhishek\OneDrive\Desktop\Assignment C Programming" ; if ($?) { gcc Abhishek.c -o Abhishek } ; if ($?) { .\Abhishek }
PS C:\Users\Abhishek\OneDrive\Desktop\Assignment C Programming>
```

The command runs the gcc compiler on the file 'Abhishek.c' to produce an executable named 'Abhishek'. It then attempts to run the executable. The terminal interface includes standard icons for file operations like code, trash, and search.

- Explanation:- The code is syntactically correct, so it compiles successfully. However, dividing a number by zero causes a runtime error, leading to abnormal termination.