CSA 1447- COMPILER DESIGN FOR SYNTAX SMITH

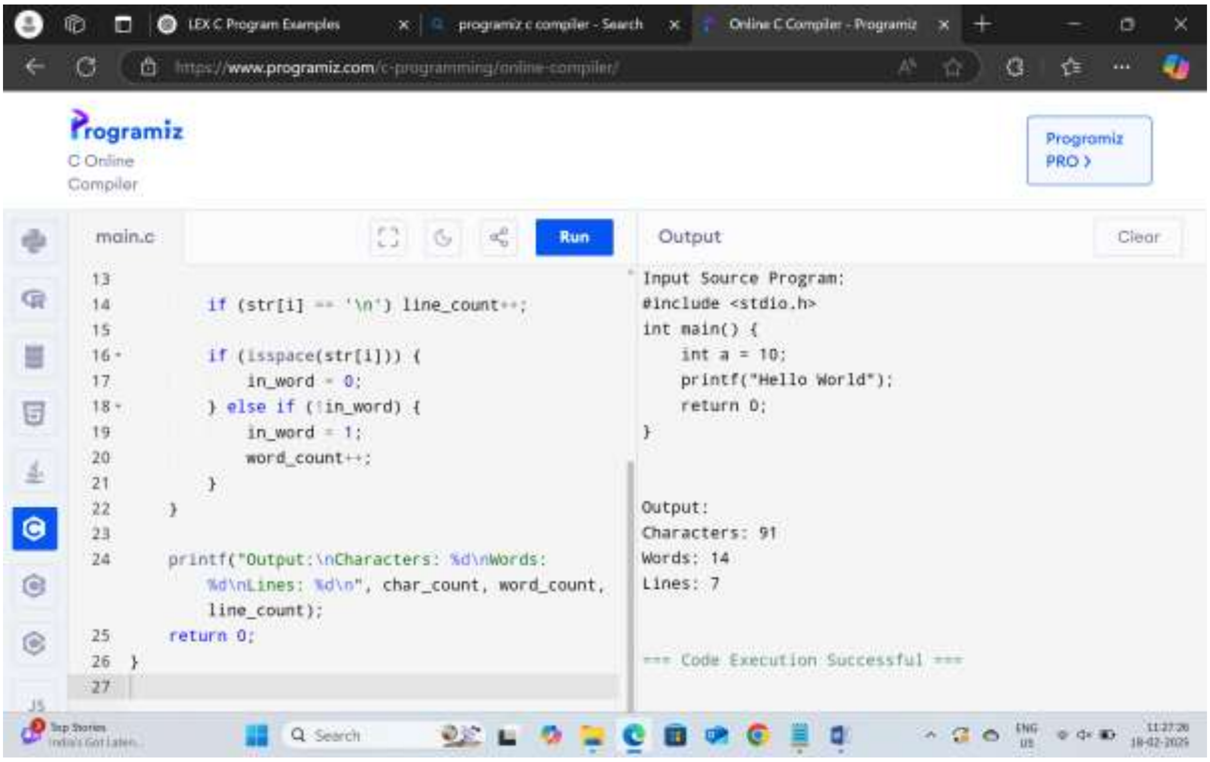
PRACTICAL PROGRAMS 15-21

EXPERIMENT -15

PROGRAM:

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

int main() {
    char str[] = "#include <stdio.h>\nint main() {\n    int a = 10;\n    printf(\"Hello World\");\n    return 
0;\n}\n";
    int char_count = 0, word_count = 0, line_count = 1;
    int in_word = 0;

    printf("Input Source Program:\n%s\n\n", str);

    for (int i = 0; str[i] != '\0'; i++) {
        char_count++;

        if (str[i] == '\n') line_count++;

        if (isspace(str[i])) {
            in_word = 0;
        } else if (!in_word) {
            in_word = 1;
            word_count++;
        }
    }

    printf("Output:\nCharacters: %d\nWords: %d\nLines: %d\n", char_count, word_count, 
line_count);
    return 0;
}
```

OUTPUT:


LEX C Program Examples
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Programiz
C Online Compiler
Programiz PRO ›
main.c
Run
Output
Clear

```
    if (str[i] == '\n') line_count++;

    if (isspace(str[i])) {
        in_word = 0;
    } else if (!in_word) {
        in_word = 1;
        word_count++;
    }
}

printf("Output:\nCharacters: %d\nWords:
    %d\nLines: %d\n", char_count, word_count,
    line_count);
return 0;
}
```

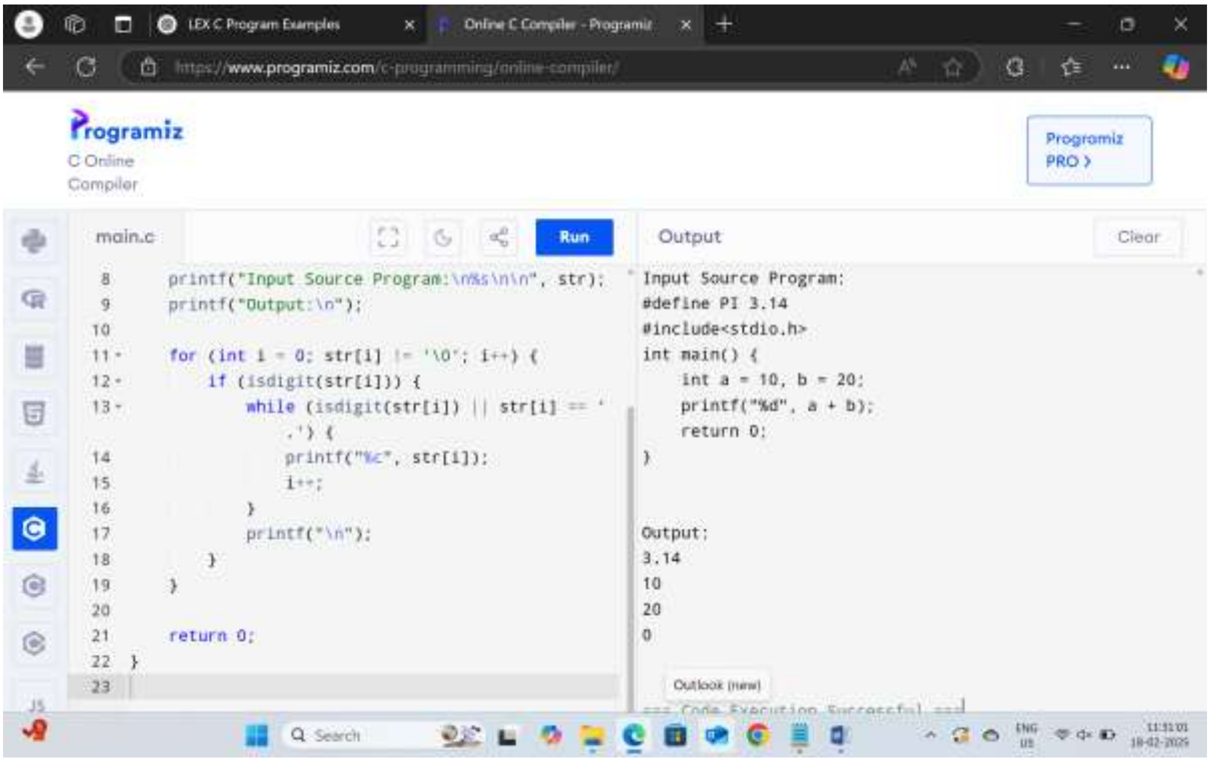
```
Input Source Program:
#include <stdio.h>
int main() {
    int a = 10;
    printf("Hello World");
    return 0;
}


Output:
Characters: 91
Words: 14
Lines: 7


=== Code Execution Successful ===
```

EXPERIMENT-16

PROGRAM:

```
#include <stdio.h>

#include <ctype.h>

#include <stdlib.h>


int main() {

   char str[] = "#define PI 3.14\n#include<stdio.h>\nint main() {\n    int a = 10, b = 20;\n
printf(\"%d\", a + b);\n    return 0;\n}\n";


   printf("Input Source Program:\n%s\n\n", str);

   printf("Output:\n");


   for (int i = 0; str[i] != '\0'; i++) {

      if (isdigit(str[i])) {

         while (isdigit(str[i]) || str[i] == '.') {

            printf("%c", str[i]);
            i++;
        }
        printf("\n");
    }
}

return 0;
}
```

OUTPUT:



```
    printf("Input Source Program:\n%s\n\n", str);
    printf("Output:\n");

    for (int i = 0; str[i] != '\0'; i++) {
        if (isdigit(str[i])) {
            while (isdigit(str[i]) || str[i] == '
                .') {
                printf("%c", str[i]);
                i++;
            }
            printf("\n");
        }
    }

    return 0;
}
```

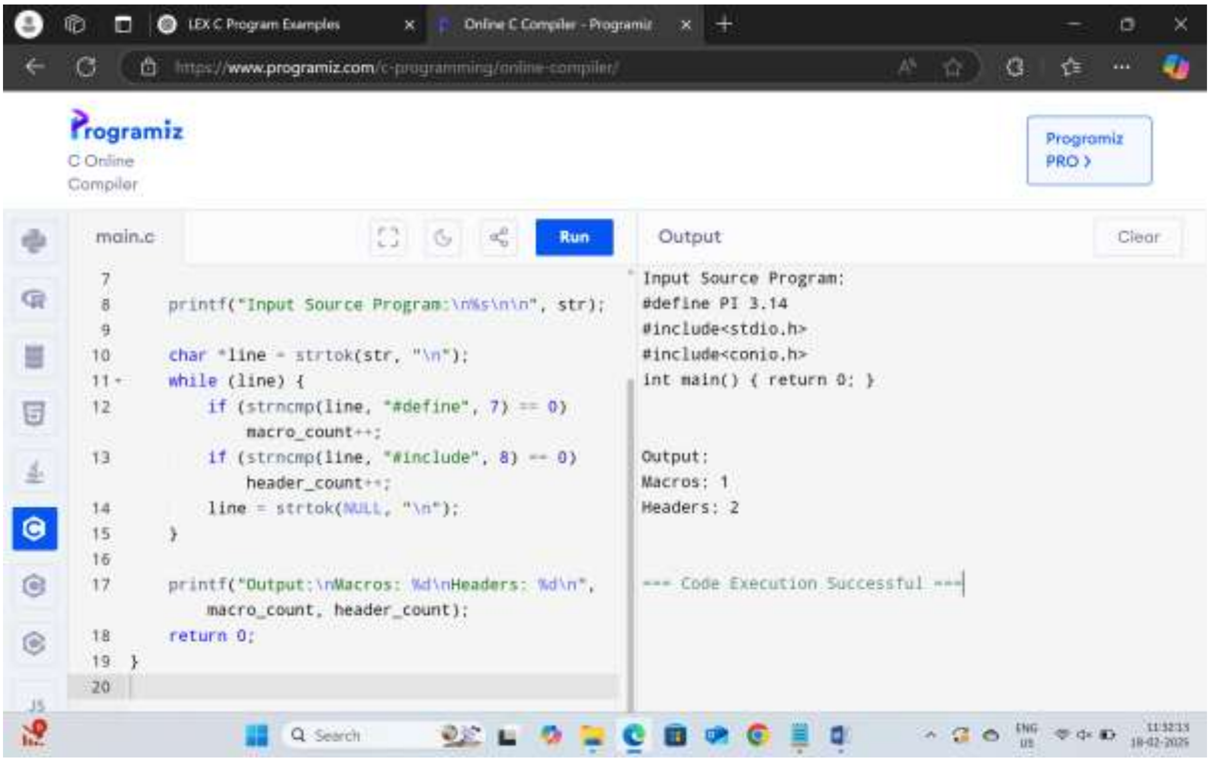
```
Input Source Program:
#define PI 3.14
#include<stdio.h>
int main() {
    int a = 10, b = 20;
    printf("%d", a + b);
    return 0;
}


Output:
3.14
10
20
0

=== Code Execution Successful ===
```

EXPERIMENT-17

PROGRAM:

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

int main() {
    char str[] = "#define PI 3.14\n#include<stdio.h>\n#include<conio.h>\nint main() { return 0; }\n";
    int macro_count = 0, header_count = 0;
    printf("Input Source Program:\n%s\n\n", str);


    char *line = strtok(str, "\n");

    while (line) {

        if (strncmp(line, "#define", 7) == 0) macro_count++;

        if (strncmp(line, "#include", 8) == 0) header_count++;

        line = strtok(NULL, "\n");

    }


    printf("Output:\nMacros: %d\nHeaders: %d\n", macro_count, header_count);

    return 0;

}
```

OUTPUT:



```
    printf("Input Source Program:\n%s\n\n", str);

    char *line = strtok(str, "\n");
    while (line) {
        if (strncmp(line, "#define", 7) == 0)
            macro_count++;
        if (strncmp(line, "#include", 8) == 0)
            header_count++;
        line = strtok(NULL, "\n");
    }

    printf("Output:\nMacros: %d\nHeaders: %d\n",
        macro_count, header_count);
    return 0;
}
```

```
Input Source Program:
#define PI 3.14
#include<stdio.h>
#include<conio.h>
int main() { return 0; }


Output:
Macros: 1
Headers: 2


=== Code Execution Successful ===
```

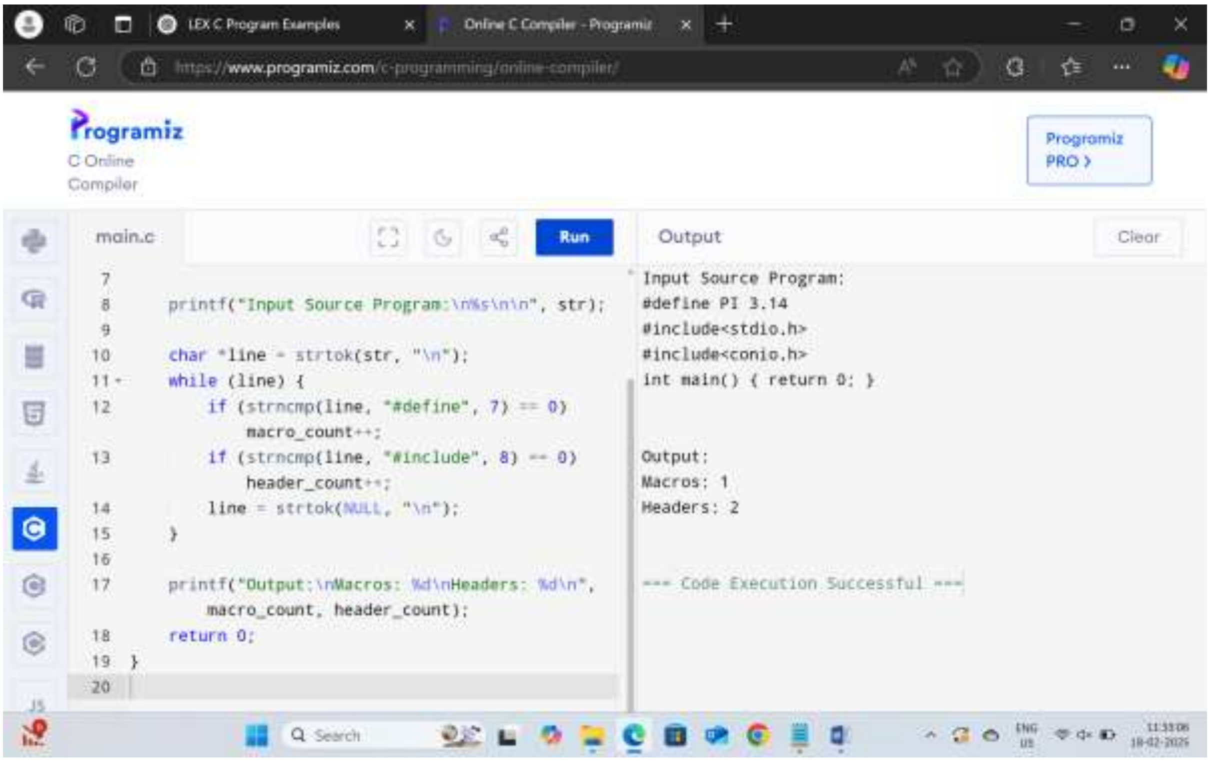
EXPERIMENT 18

PROGRAM:

```
#include <stdio.h>

#include <string.h>
```

```
int main() {
    char str[] = "#define PI 3.14\n#include<stdio.h>\n#include<conio.h>\nint main() { return 0; }\n";
    int macro_count = 0, header_count = 0;

    printf("Input Source Program:\n%s\n\n", str);

    char *line = strtok(str, "\n");
    while (line) {
        if (strncmp(line, "#define", 7) == 0) macro_count++;
        if (strncmp(line, "#include", 8) == 0) header_count++;
        line = strtok(NULL, "\n");
    }

    printf("Output:\nMacros: %d\nHeaders: %d\n", macro_count, header_count);
    return 0;
}
```

OUTPUT:



```

    printf("Input Source Program:\n%s\n\n", str);

    char *line = strtok(str, "\n");
    while (line) {
        if (strncmp(line, "#define", 7) == 0)
            macro_count++;
        if (strncmp(line, "#include", 8) == 0)
            header_count++;
        line = strtok(NULL, "\n");
    }

    printf("Output:\nMacros: %d\nHeaders: %d\n",
        macro_count, header_count);
    return 0;
}

```

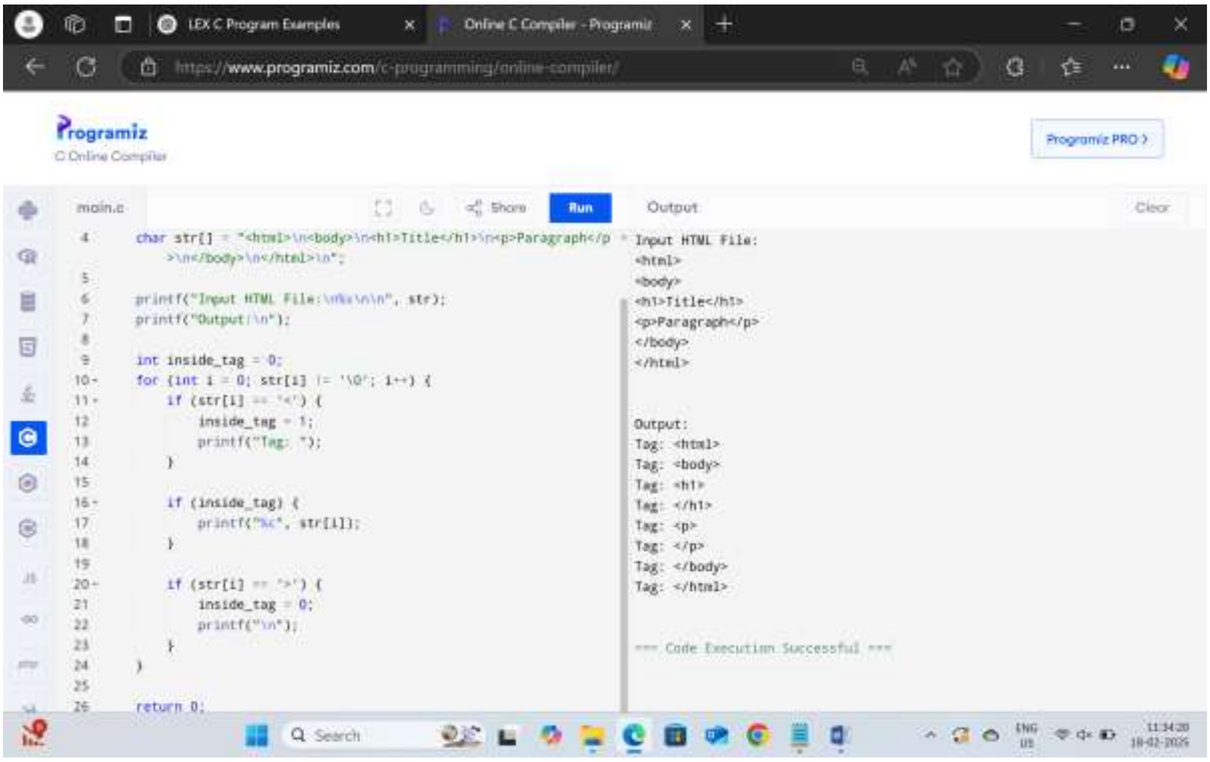
```
Input Source Program:
#define PI 3.14
#include<stdio.h>
#include<conio.h>
int main() { return 0; }


Output:
Macros: 1
Headers: 2


=== Code Execution Successful ===
```

EXPERIMENT-19

PROGRAM:

```
#include <stdio.h>

int main() {
  char str[] = "<html>\n<body>\n<h1>Title</h1>\n<p>Paragraph</p>\n</body>\n</html>\n";

  printf("Input HTML File:\n%s\n\n", str);
  printf("Output:\n");

  int inside_tag = 0;
  for (int i = 0; str[i] != '\0'; i++) {
    if (str[i] == '<') {
      inside_tag = 1;
      printf("Tag: ");
    }

    if (inside_tag) {
      printf("%c", str[i]);
    }

    if (str[i] == '>') {
      inside_tag = 0;
      printf("\n");
    }
  }

  return 0;
}
```

OUTPUT:



```
    char str[] = "<html>\n<body>\n<h1>Title</h1>\n<p>Paragraph</p
        >\n</body>\n</html>\n";

    printf("Input HTML File:\n%s\n\n", str);
    printf("Output:\n");

    int inside_tag = 0;
    for (int i = 0; str[i] != '\0'; i++) {
        if (str[i] == '<') {
            inside_tag = 1;
            printf("Tag: ");
        }

        if (inside_tag) {
            printf("%c", str[i]);
        }

        if (str[i] == '>') {
            inside_tag = 0;
            printf("\n");
        }
    }

    return 0;
```

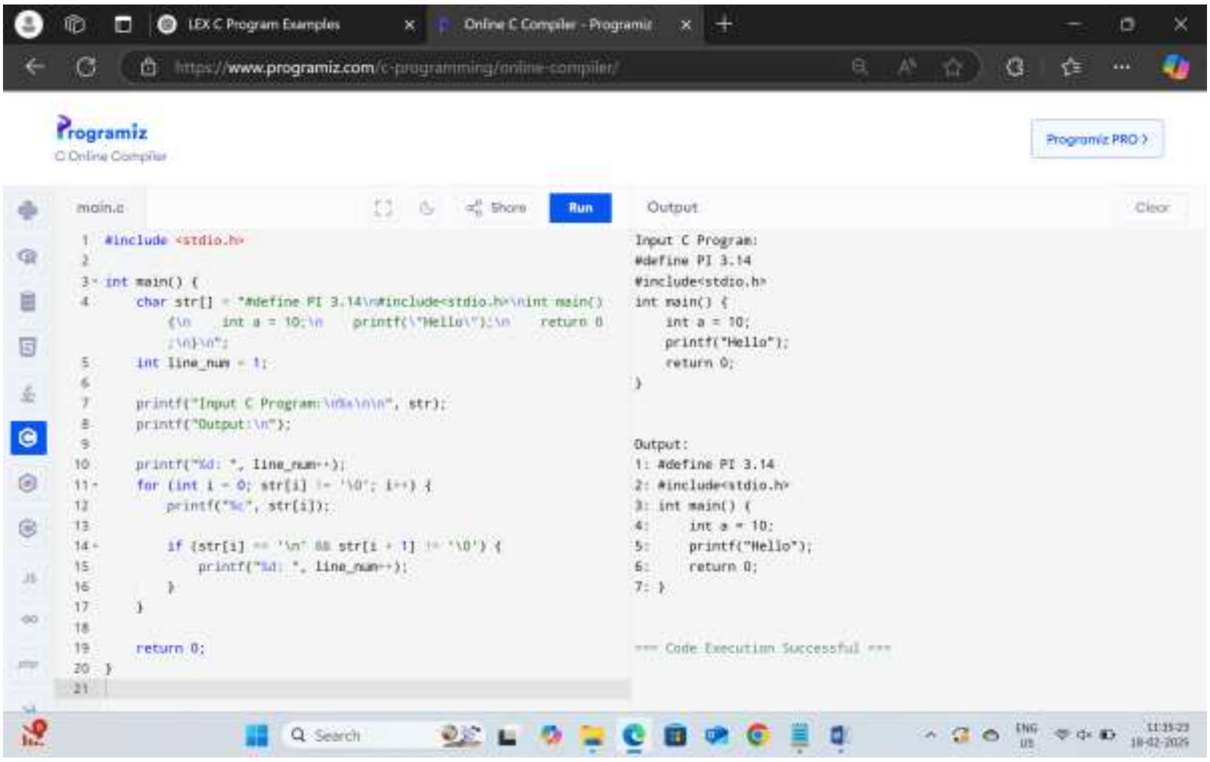
```
Input HTML File:
<html>
<body>
<h1>Title</h1>
<p>Paragraph</p>
</body>
</html>


Output:
Tag: <html>
Tag: <body>
Tag: <h1>
Tag: </h1>
Tag: <p>
Tag: </p>
Tag: </body>
Tag: </html>


=== Code Execution Successful ===
```

EXPERIMENT-20

PROGRAM:

```
#include <stdio.h>


int main() {
   char str[] = "#define PI 3.14\n#include<stdio.h>\nint main() {\n    int a = 10;\n    printf(\"Hello\");\n    return 0;\n}\n";
   int line_num = 1;


   printf("Input C Program:\n%s\n\n", str);
   printf("Output:\n");


   printf("%d: ", line_num++);
   for (int i = 0; str[i] != '\0'; i++) {
      printf("%c", str[i]);


      if (str[i] == '\n' && str[i + 1] != '\0') {
            printf("%d: ", line_num++);
        }
    }

    return 0;
}
```

OUTPUT:



```
#include <stdio.h>

int main() {
    char str[] = "#define PI 3.14\n#include<stdio.h>\nint main()
        {\n    int a = 10;\n    printf(\"Hello\");\n    return 0
        ;\n}\n";
    int line_num = 1;

    printf("Input C Program:\n%s\n\n", str);
    printf("Output:\n");

    printf("%d: ", line_num++);
    for (int i = 0; str[i] != '\0'; i++) {
        printf("%c", str[i]);

        if (str[i] == '\n' && str[i + 1] != '\0') {
            printf("%d: ", line_num++);
        }
    }

    return 0;
}
```

```
Input C Program:
#define PI 3.14
#include<stdio.h>
int main() {
    int a = 10;
    printf("Hello");
    return 0;
}


Output:
1: #define PI 3.14
2: #include<stdio.h>
3: int main() {
4:     int a = 10;
5:     printf("Hello");
6:     return 0;
7: }


=== Code Execution Successful ===
```

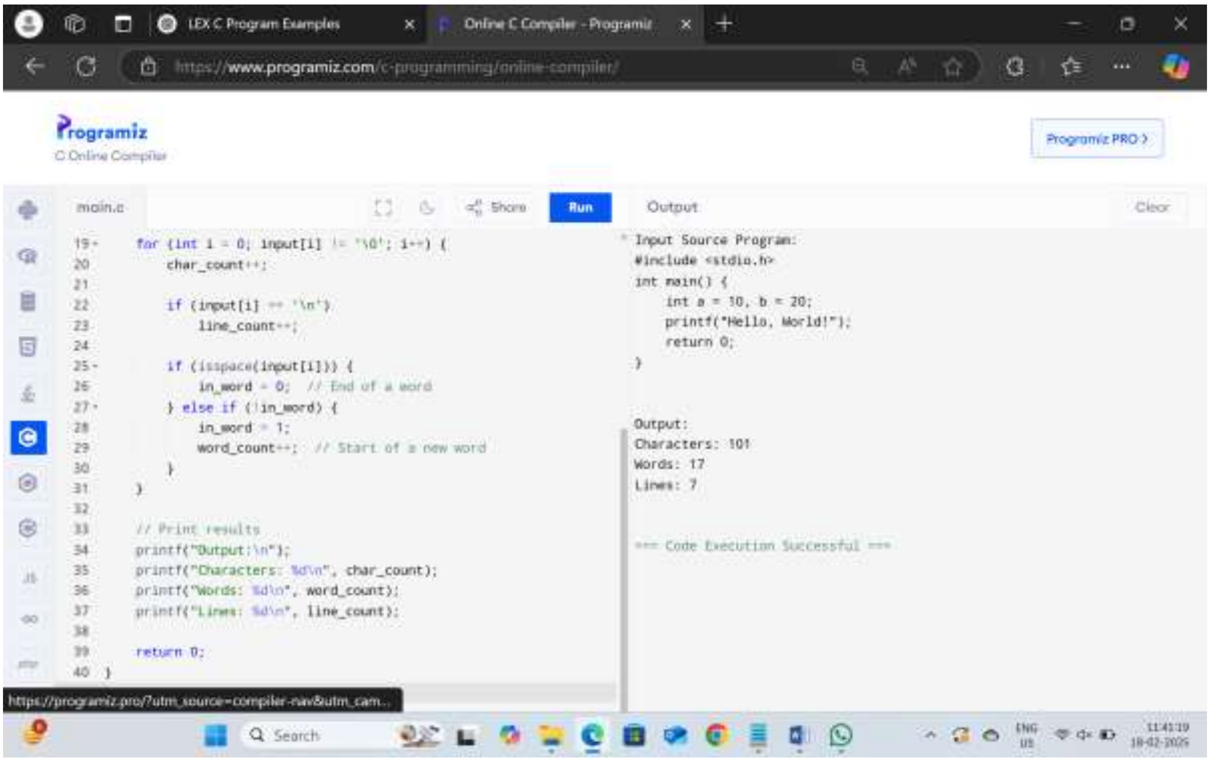
EXPERIMENT-21

PROGRAM:

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

int main() {
    // Sample Input: A small C program stored in a string
    char input[] =
        "#include <stdio.h>\n"
        "int main() {\n"
        "    int a = 10, b = 20;\n"
        "    printf(\"Hello, World!\");\n"
        "    return 0;\n"
        "}\n";

    int char_count = 0, word_count = 0, line_count = 1;
    int in_word = 0;

    printf("Input Source Program:\n%s\n\n", input);

    for (int i = 0; input[i] != '\0'; i++) {
        char_count++;

        if (input[i] == '\n')
            line_count++;

        if (isspace(input[i])) {
            in_word = 0;  // End of a word
        } else if (!in_word) {
            in_word = 1;
            word_count++;  // Start of a new word
        }
    }

    // Print results
    printf("Output:\n");
    printf("Characters: %d\n", char_count);
    printf("Words: %d\n", word_count);
    printf("Lines: %d\n", line_count);

    return 0;
```

}

OUTPUT:



```c
    for (int i = 0; input[i] != '\0'; i++) {
        char_count++;

        if (input[i] == '\n')
            line_count++;

        if (isspace(input[i])) {
            in_word = 0;  // End of a word
        } else if (!in_word) {
            in_word = 1;
            word_count++;  // Start of a new word
        }
    }

    // Print results
    printf("Output:\n");
    printf("Characters: %d\n", char_count);
    printf("Words: %d\n", word_count);
    printf("Lines: %d\n", line_count);

    return 0;
}
```

```
Input Source Program:
#include <stdio.h>
int main() {
    int a = 10, b = 20;
    printf("Hello, World!");
    return 0;
}


Output:
Characters: 101
Words: 17
Lines: 7


=== Code Execution Successful ===
```