Embedded C

Source2html project
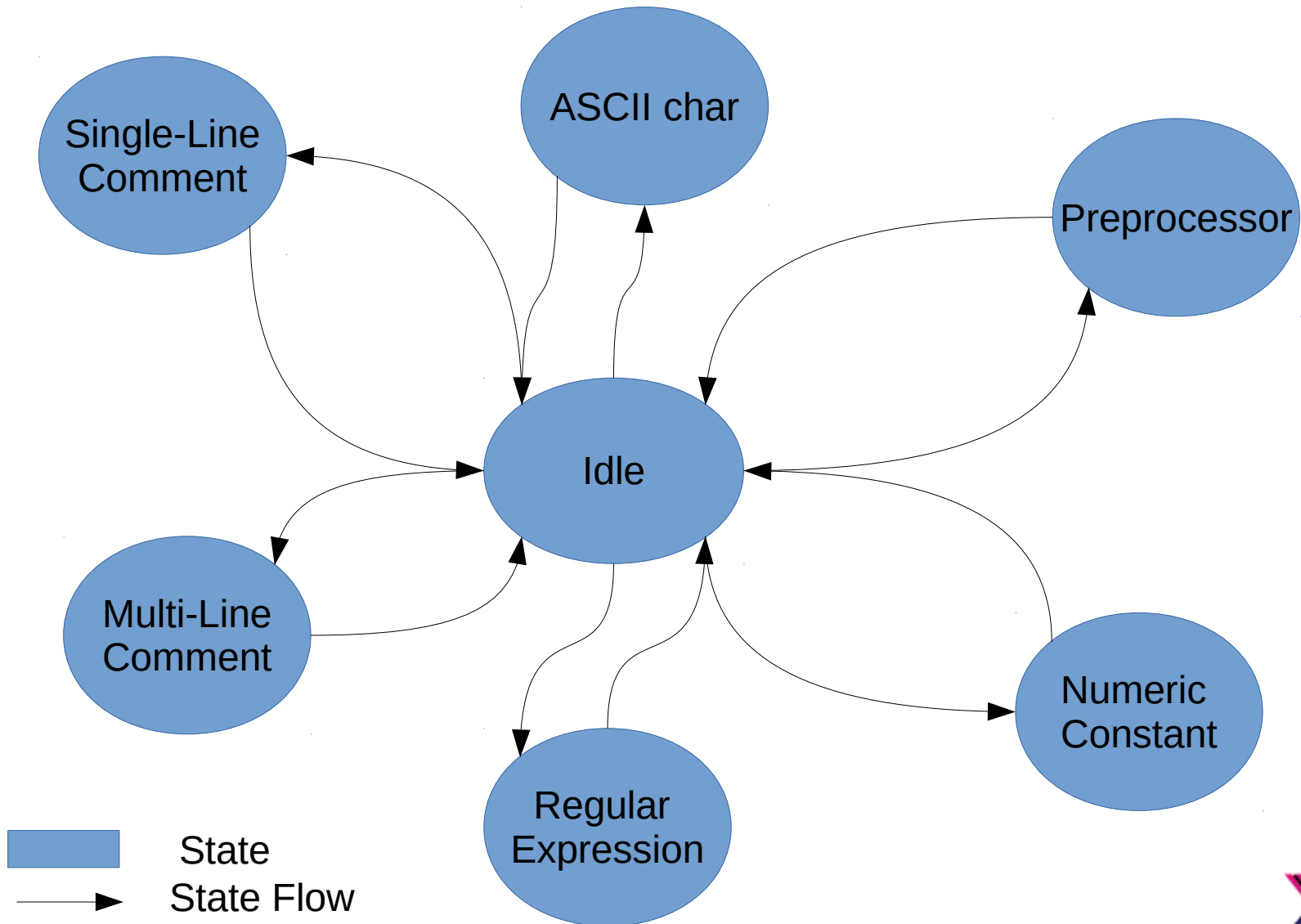
By Team Emertxe

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Source2html

What is Source2html?

- The purpose of Source2html project is to display source code in Browser
- Source2html program shall parse a source file and generate equivalent HTML file
- Browser takes HTML file as input and renders it in Browser window to display source code
- Reserved key words, preprocessor directives, numerical constants, strings, ASCII characters etc must be displayed in pre-defined color
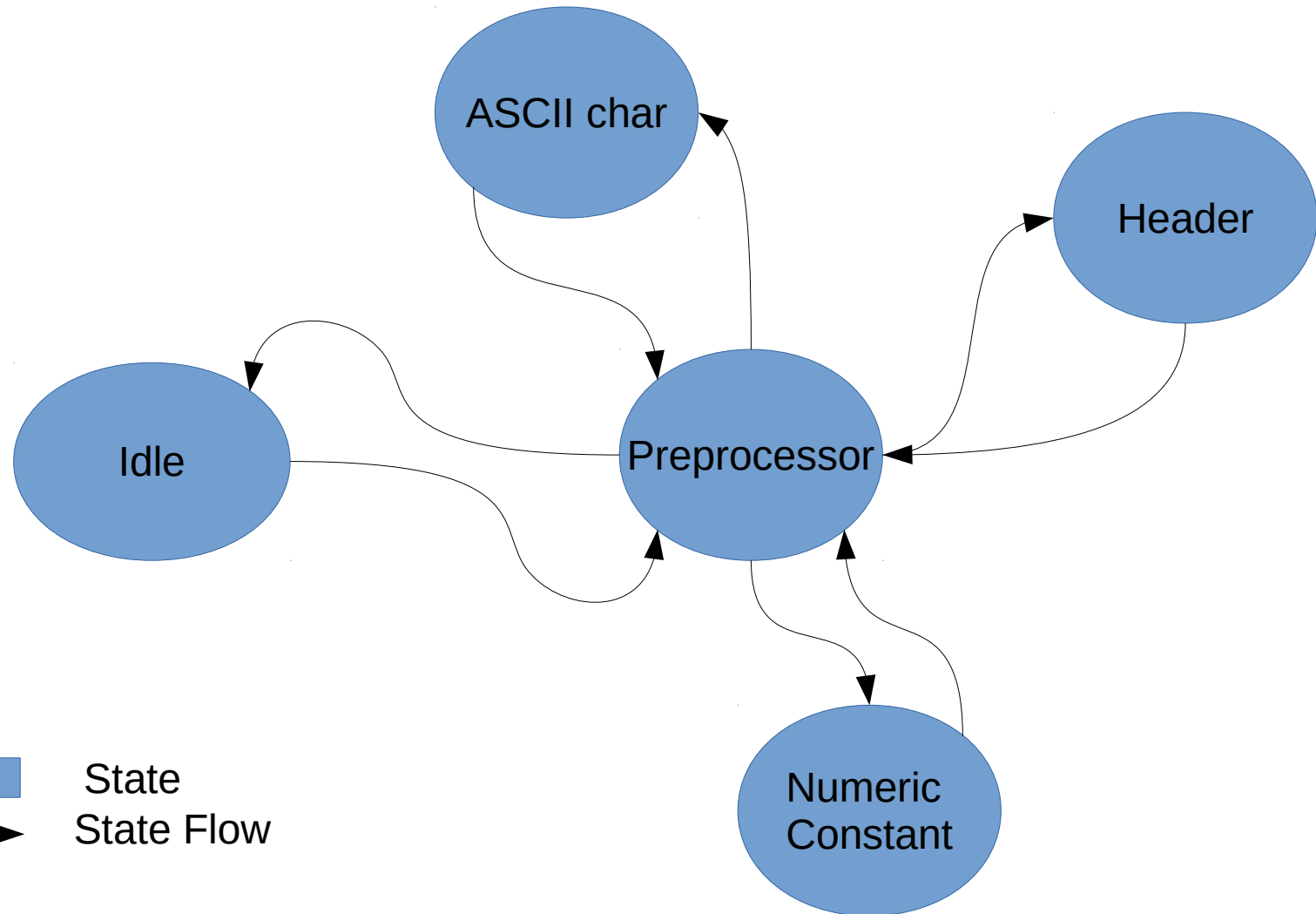
Approach to implement

- Design a parser engine using state-event approach
- Stay in idle state at program start-up
- Identify beginning of words, comments, preprocessor, constants etc and move to specific state
- Store the characters in buffer while staying in the specific state
- Identify end of words, comments, preprocessor, numeric constants and return an event
- Leave the specific state and move back to Idle state

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State Transition

Single-Line Comment

ASCII char

Preprocessor

Idle

Multi-Line Comment

Numeric Constant

Regular Expression

State

State Flow

State Transition…

State Transition

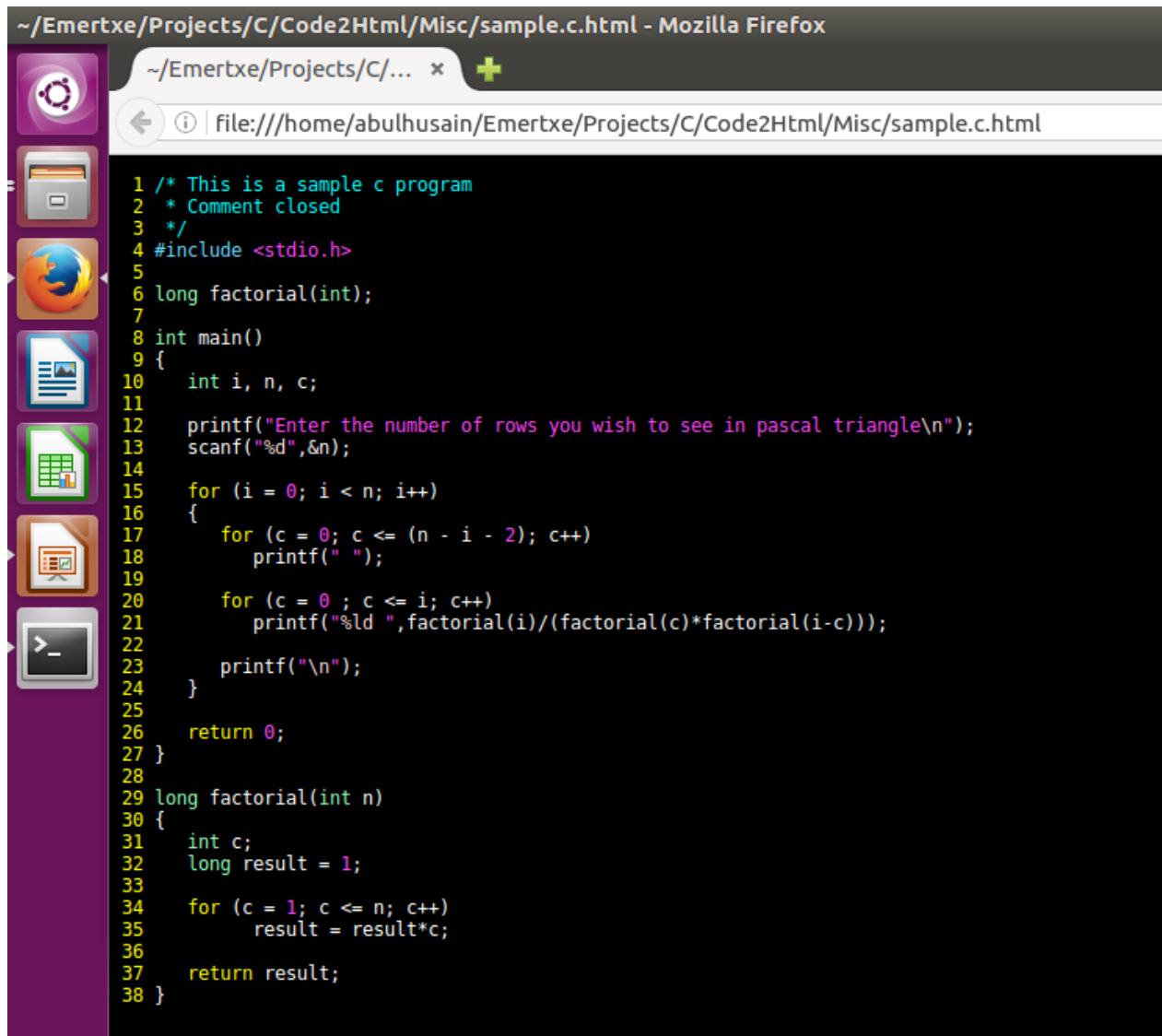| S.N.	Description	Begining	State Transition	End
1	Comments	/*	Idle to multiline comments	*/
	Single line	//	Idle to Single Line comments	\n
2	Reserved	a~z	Idle or preprocessor to reserved key word	Space,), (,
3	Ascii Char	Single quote	Idle or preprocessor to ASCII char	Single quote
4	Preprocessor directive	#	Idle to preprocessor directive	Space, <
5	Header File	< or "	preprocessor to header file	>, "
6	Regular Expression	others	Idle to regular expression	Begining of
7	Numric constant	0~9	Idle or preprocessor to numeric constant	Space, ;,), },], comma

Events

Sl No	Description	Event
1	No data	PEVENT_NULL
2	Pre-processor directive data	PEVENT_PREPROCESSOR_DIRECTIVE
3	Reserved keyword data	PEVENT_RESERVE_KEYWORD
4	Numeric constants data	PEVENT_NUMERIC_CONSTANT
5	String data	PEVENT_STRING
6	Header file (user or std)	PEVENT_HEADER_FILE
7	Regular source expressions	PEVENT_REGULAR_EXPRESSION
8	// Single Comments	PEVENT_SINGLE_LINE_COMMENT
9	/* Multi line comments */	PEVENT_MULTI_LINE_COMMENT
10	ASCII char data	PEVENT_ASCII_CHAR
11	EOF is reached	PEVENT_EOF

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Example execution

Syntax:

- ./<executable file> <source file> <output file> <-n>

- 2nd and 3rd arguments are optional
- -n will show source code line no in HTML

- Example : ./a.out file.c file.html -n

Expected output

~/Emertxe/Projects/C/Code2Html/Misc/sample.c.html - Mozilla Firefox

~/Emertxe/Projects/C/...   ×

file:///home/abulhusain/Emertxe/Projects/C/Code2Html/Misc/sample.c.html

```c
1 /* This is a sample c program
2  * Comment closed
3  */
4 #include <stdio.h>
5
6 long factorial(int);
7
8 int main()
9 {
10    int i, n, c;
11
12    printf("Enter the number of rows you wish to see in pascal triangle\n");
13    scanf("%d",&n);
14
15    for (i = 0; i < n; i++)
16    {
17        for (c = 0; c <= (n - i - 2); c++)
18            printf(" ");
19
20        for (c = 0 ; c <= i; c++)
21            printf("%ld ",factorial(i)/(factorial(c)*factorial(i-c)));
22
23        printf("\n");
24    }
25
26    return 0;
27 }
28
29 long factorial(int n)
30 {
31    int c;
32    long result = 1;
33
34    for (c = 1; c <= n; c++)
35        result = result*c;
36
37    return result;
38 }
```

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Color Scheme

S.N.	Type	Color
1	Comments	blue
2	Reserved Key words (data)	green
3	Reserved Key words (Non data)	goldenrod
4	Preprocessor dir	purple
5	Header files	red
6	String	magenta
7	Numric constant	brown
8	ASCII char	firebrick

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About HTML

- You don't have to be master of html, but need to know basics of HTML
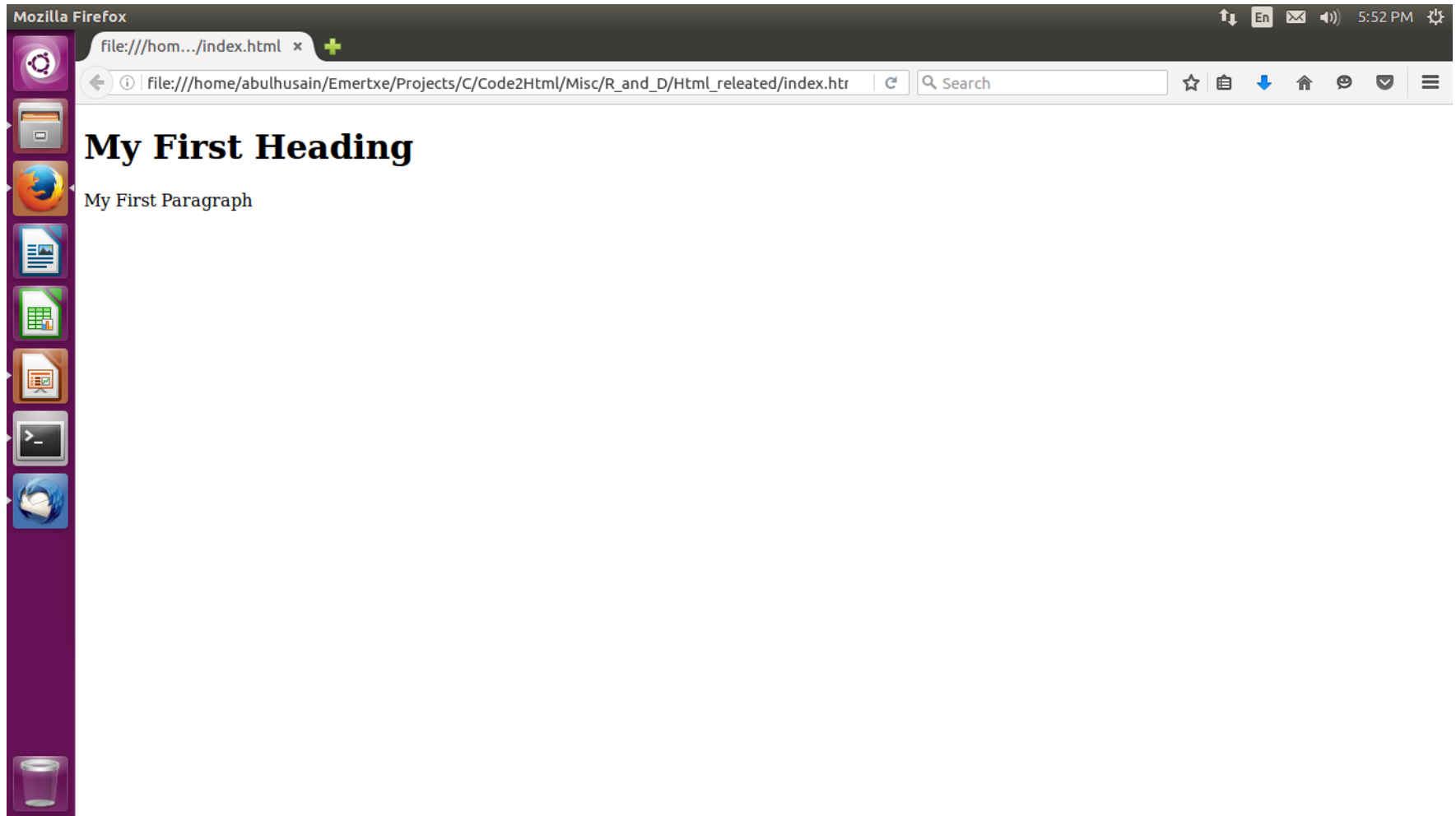- Understand the basic syntax and rules of HTML as needed (not in-depth)

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HTML Basics

- Set type of HTML version
- Set language
- Set text format
- Set paragraph formats
- Set Background and text color
- Use style sheet to apply text color

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HTML Basics

```
<!DOCTYPE html>
<html>
<body>
<h1>My First Heading</h1>
<p>My First paragraph</p>
</body>
</html>
```
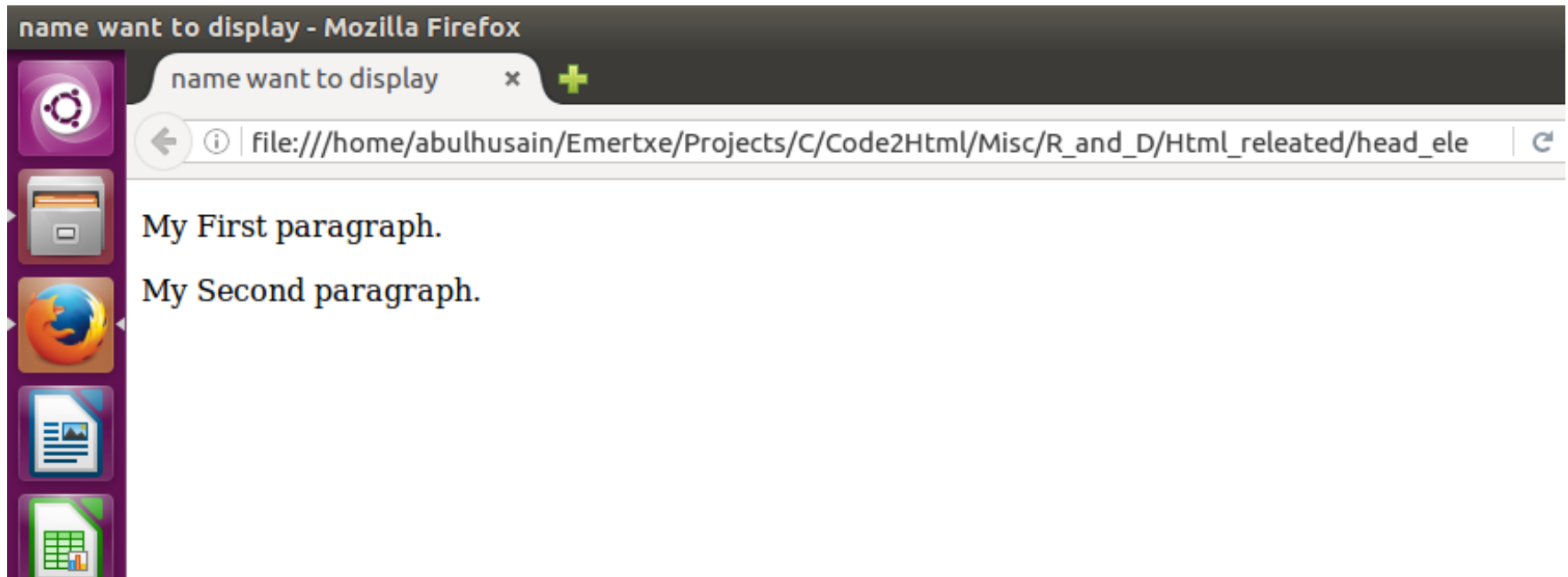
Cont...

Setting Language

```
<!DOCTYPE html>
<html lang="en-US">
<body>
<h1>My First Heading</h1>
<p>My First paragraph</p>
</body>
</html>
```

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Setting header and encoding

```
<!DOCTYPE html>
<html lang="en-US">
<head>
    <tittle>Name to display in browser tab</tittle>
    <meta charset="UFT-8">
</head>
<body>
    <p>My First paragraph</p>
    <p>My Second paragraph</p>
</body>
</html>
```

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Cont...

Setting Paragraph

- Paragraph is used to display a complete line in HTML
- We can set the paragraph format in two ways
  - Non format paragraph
    - Use start tag "<p>" and end tag "</p>"
- Any text in paragraph is displayed in a line

```
<!DOCTYPE html>
<html lang="en-US">
<body>
<p>My          First          paragraph</p>
<p>My
         Second
                  paragraph</p>
</body>
</html>
```
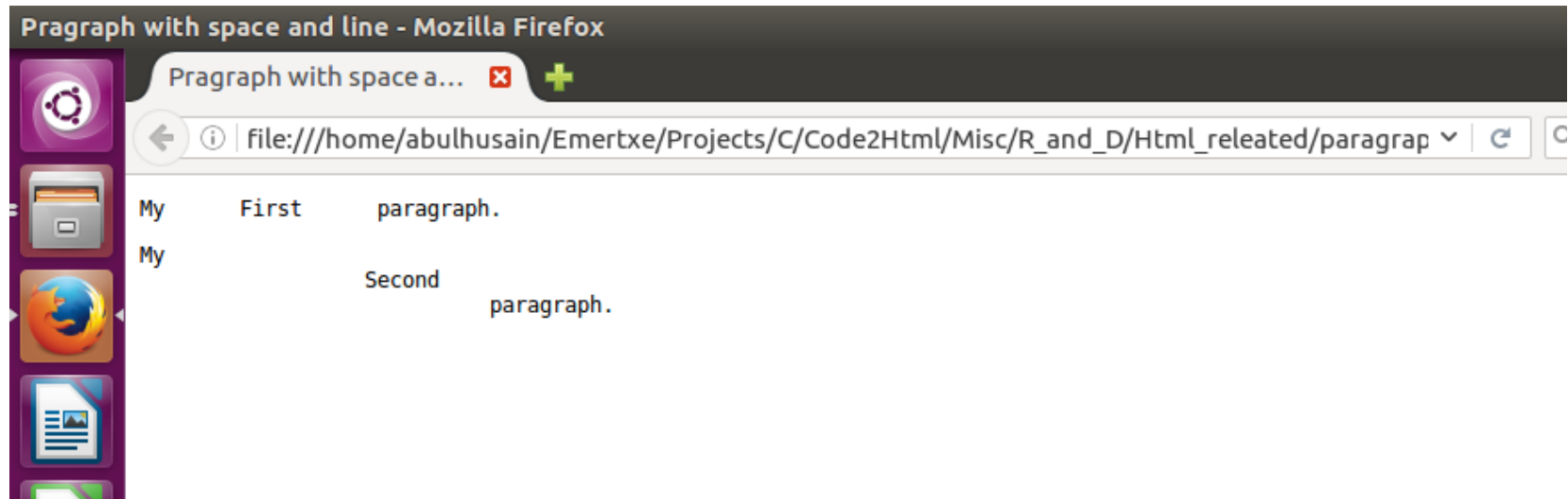
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Cont...

Pre-formatted paragraph

- Pre formatted paragraph:
    - Use start tag "<pre>" and end tag "</pre>"
    - Any text in pre tag is displayed as is in html page

```
<!DOCTYPE html>
<html lang="en-US">
<body>
<pre>My          First          paragraph</pre>
<pre>My
Second
paragraph</pre>
</body>
</html>
```

Cont...

Applying color

- Applying
  - Background color
  - Text color
- Use style properties to apply color
- Attributes like "font size", "text format" can also be changed

Syntax:

style="color:color_name;"
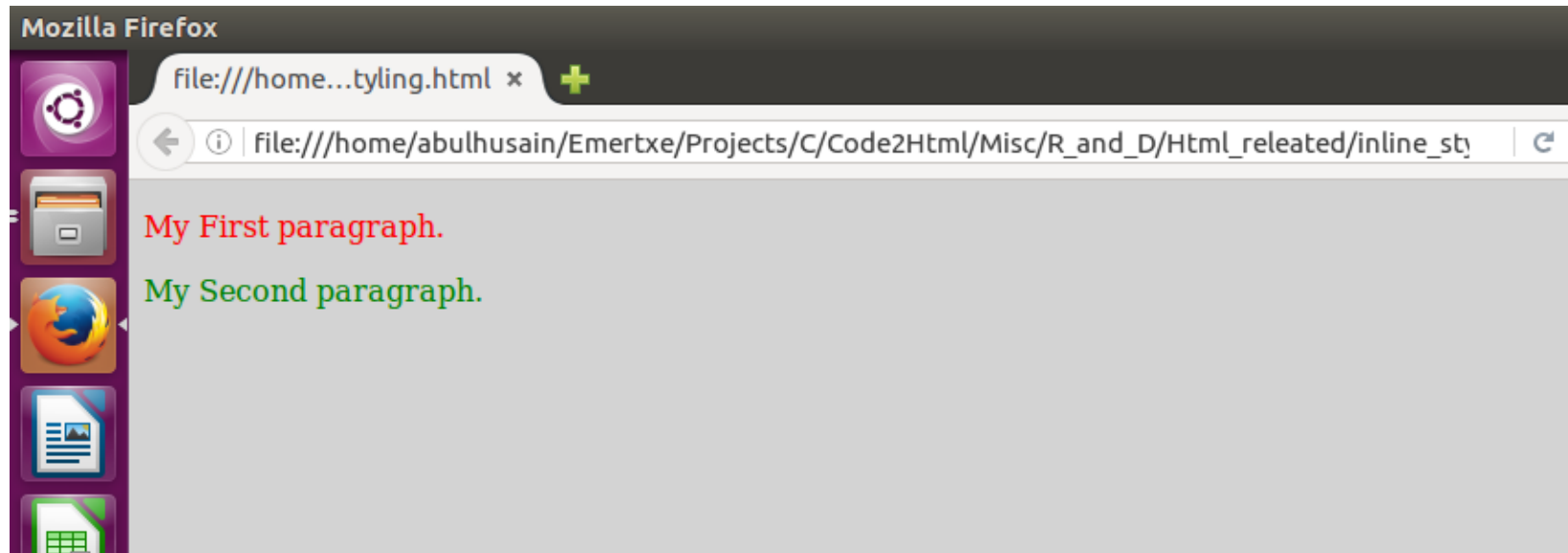style="color:color_name;font-size:num%;"

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Methods to apply color

- Three ways to apply color
  - Using style property in the element
  - Using style sheet in header
  - Using external style sheet

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Element style property

```
<!DOCTYPE html>
<html lang="en-US">
    <body style="background-color:lightgray;">
        <p style="color:red;">My First  paragraph</p>
        <p style="color:green;">My Second paragraph</p>
    </body>
</html>
```

Cont...

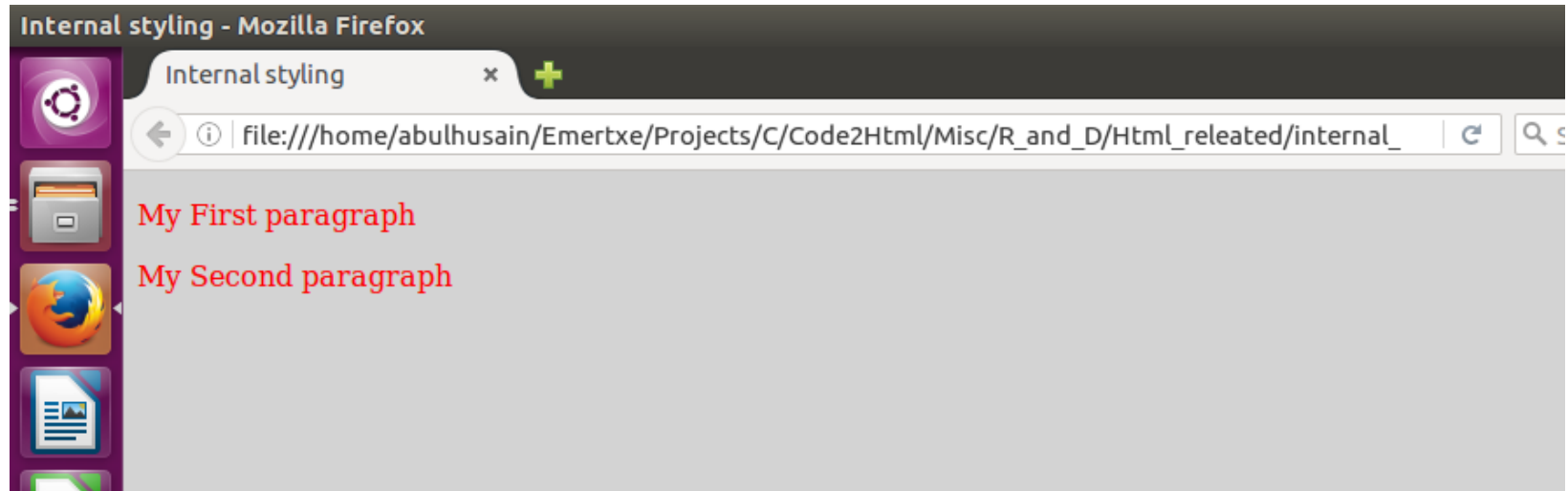# Style sheet in header

```
<!DOCTYPE html>
<html lang="en-US">
    <head>
        <style>
            body{background-color:lightgray;}
            p{color:red;}
        </style>
    </head>
    <body>
        <p>My First  paragraph</p>
        <p>My Second paragraph</p>
    </body>
</html>
```

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External style sheet

- Create style-sheet in current directory
- Define color scheme for different type of text
- The color information is applicable to entire html page
- Style-sheet extension must be ".css"

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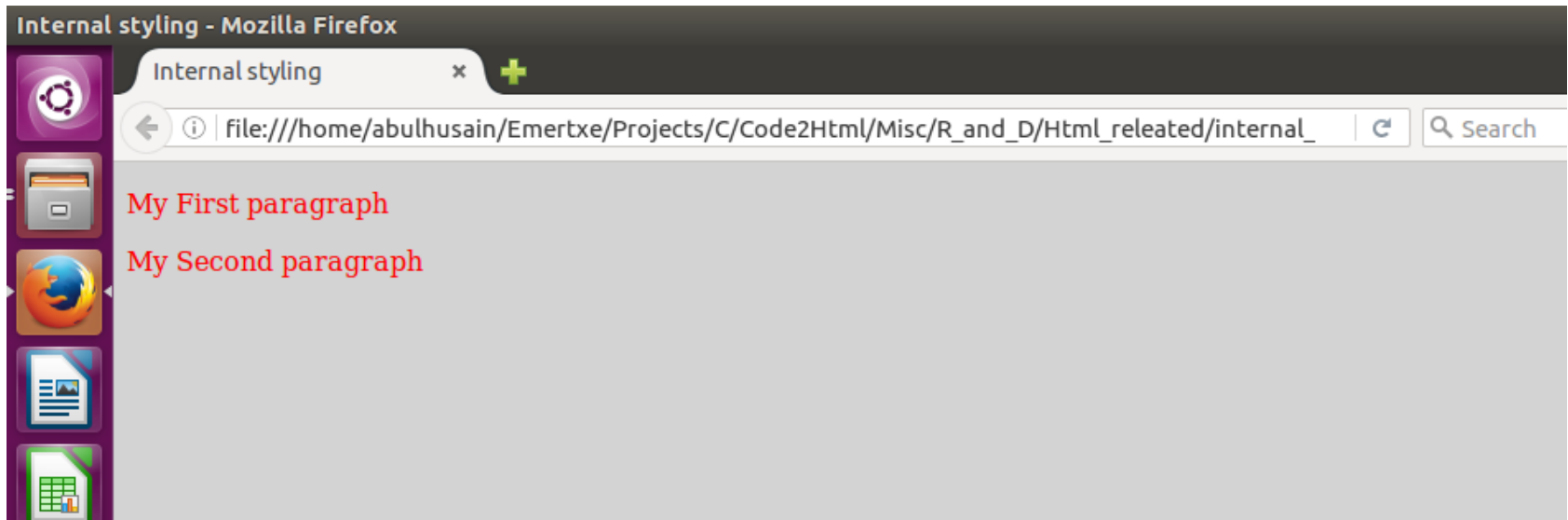# External style sheet link

```
<!DOCTYPE html>
<html lang="en-US">
    <head>
        <style>
            <link rel="stylesheet" href="styles.css">
        </style>
    </head>
    <body>
        <p>My First  paragraph</p>
        <p>My Second paragraph</p>
    </body>
</html>
```
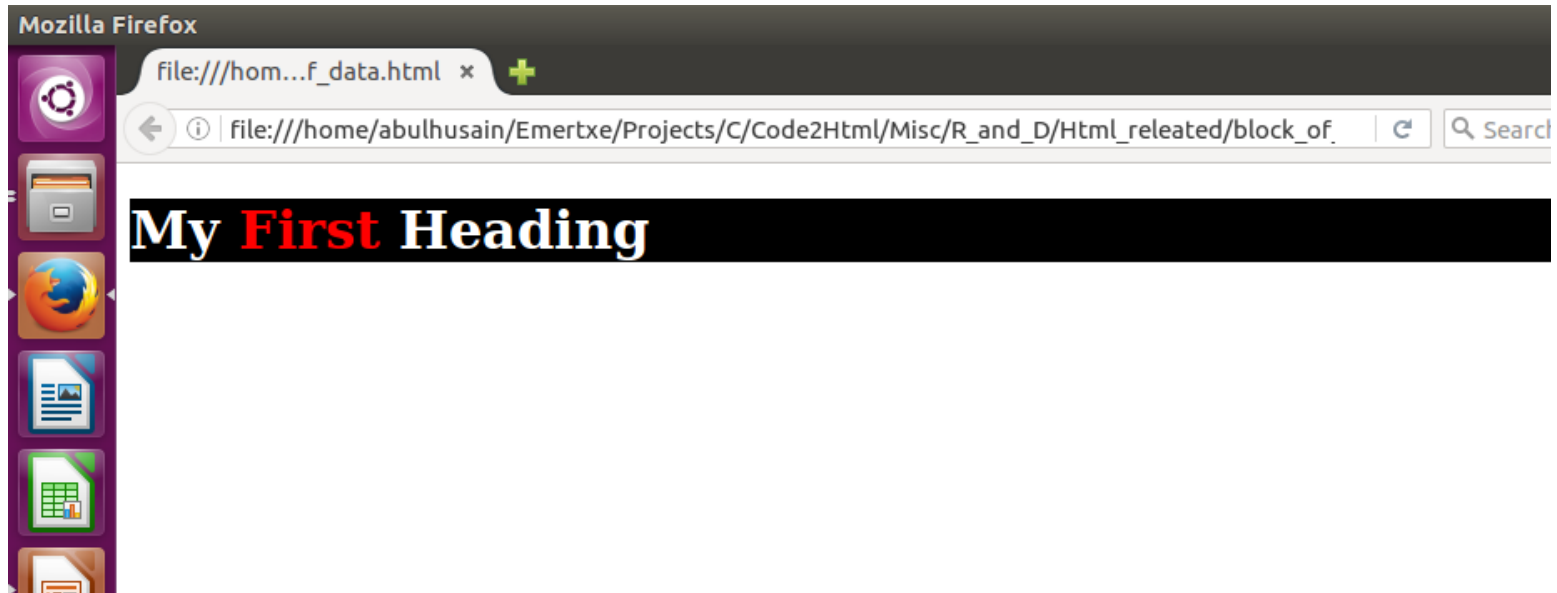
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Cont…styles.css

```css
body {
    background-color : lightgray;
}

p {
    color : blue;
}
```

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Cont…

Writing text in HTML

- Word by word
  - Write particular word without considering any white-space character
  - Example: string/char
- Block by block
  - Write few lines at a time and change its attribute
  - Example:
    <div>This is string1.
       This is string2.
    </div>

Cont…Example

```
<!DOCTYPE html>
<html lang="en-US">
    <head></head>
<body>
    <div style="background-
color:black;color:white;">
    <h1>My <span style="color:red;">First<span>
        Paragraph</h1>
    </div>
</body>
</html>
```
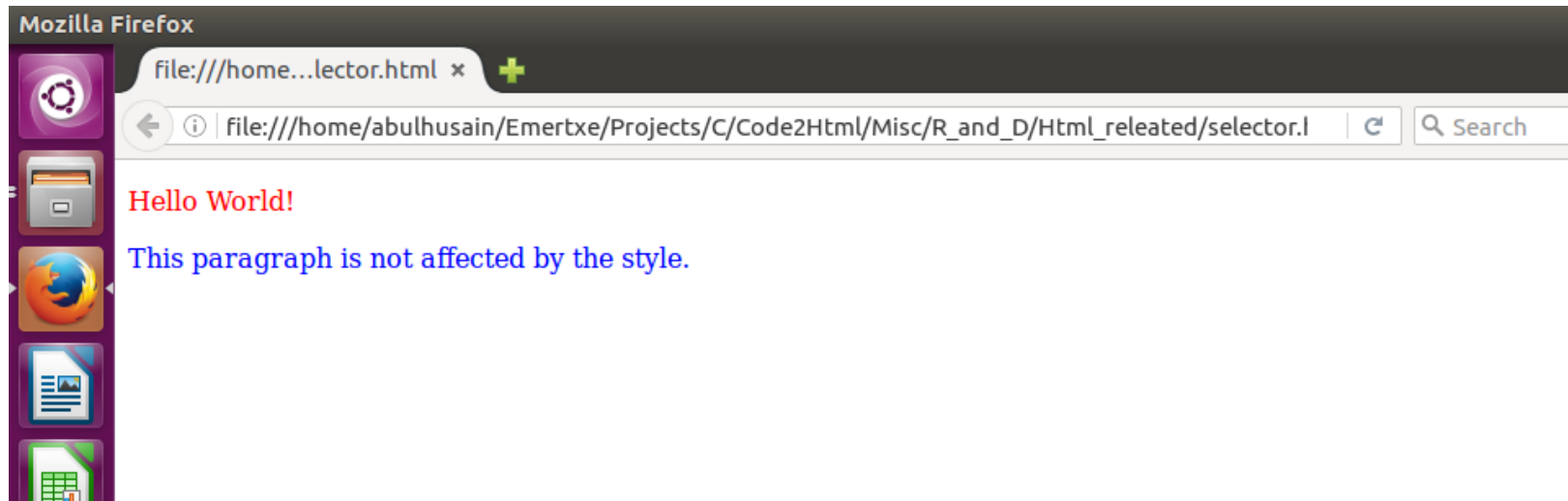
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Cont...

How to create selector?

➢ Selector means create block which can have particular attributes and can be modified independently to other blocks.

➢ It can be done in two ways:

➢ Create "id" which start with "#" in ".css" file.

➢ Create "class" which start with "." in ".css" file.

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Cont…Example

```
<!DOCTYPE html>
<html>
    <head>
        <style>
            #para1 {
                color: red;
            }
            .paragraph{
                color: blue;
            }
        </style>
    </head>
<body>
    <p id="para1">Hello World!</p>
    <p class="paragraph">This paragraph is not affected by the style.</p>
 </body>
</html>
```

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Cont...

THANK YOU