CS6612 – Compiler Lab

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Programming Assignment-8 - Code Optimization

Code:

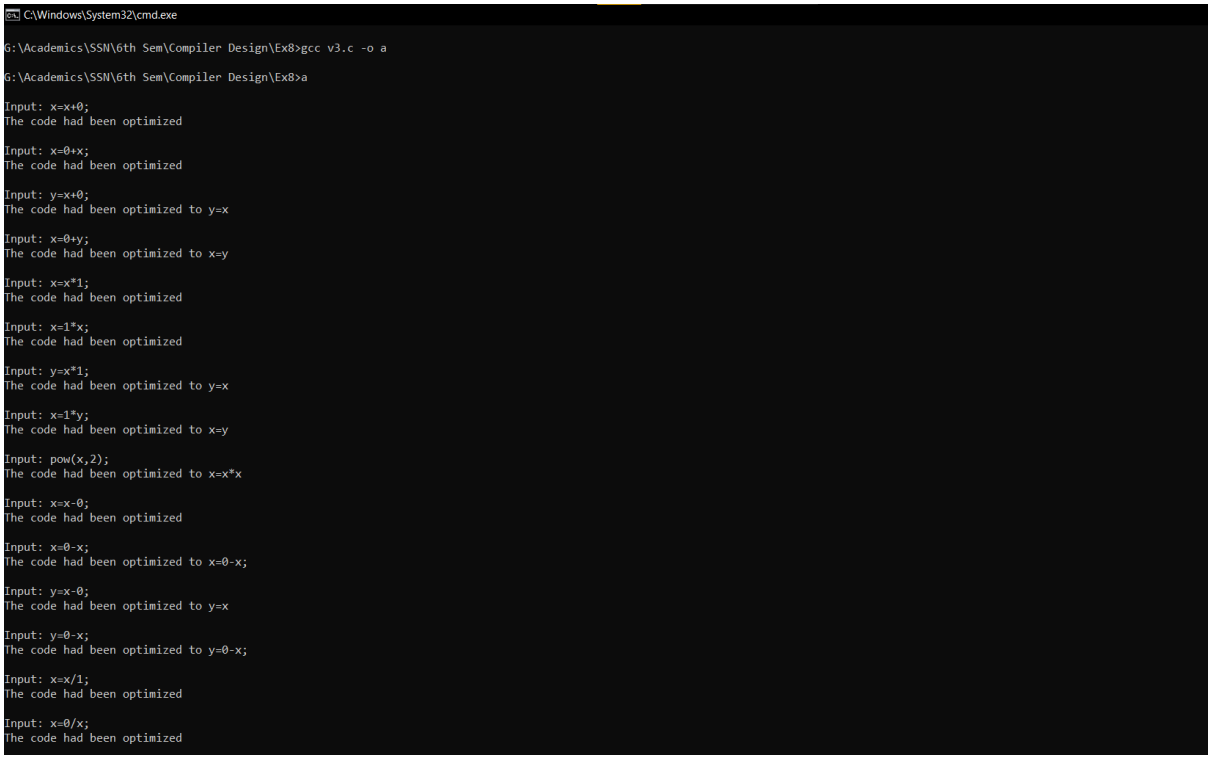
```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>

int main()
{
    FILE *fin = fopen("input.txt", "r");
    char line[100];
    while (fgets(line, 100, fin))
    {
        printf("\nInput: %s", line);
        if (line[3] == '+' && (line[2] == '0' || line[4] == '0'))
        {
            if (line[4] == '0')
            {
                if (line[0] != line[2])
                    printf("The code had been optimized to %c=%c\n", li
ne[0], line[2]);
                else
                    printf("The code had been optimized\n");
            }
            else if (line[2] == '0')
            {
                if (line[0] != line[4])
                    printf("The code had been optimized to %c=%c\n", li
ne[0], line[4]);
                else
                    printf("The code had been optimized\n");
            }
            else
            {
                 printf("The code had been optimized\n");
            }
        }
        else if (line[3] == '*' && (line[2] == '1' || line[4] == '1'))
        {
```

```
            if (line[4] == '1')
            {
                if (line[0] != line[2])
                    printf("The code had been optimized to %c=%c\n", li
ne[0], line[2]);
                else
                    printf("The code had been optimized\n");
            }
            else if (line[2] == '1')
            {
                if (line[0] != line[4])
                    printf("The code had been optimized to %c=%c\n", li
ne[0], line[4]);
                else
                    printf("The code had been optimized\n");
            }
            else
            {
                 printf("The code had been optimized\n");
            }
        }
        else if (line[3] == '-' && (line[2] == '0' || line[4] == '0'))
        {
            if (line[4] == '0')
            {
                if (line[0] != line[2])
                    printf("The code had been optimized to %c=%c\n", li
ne[0], line[2]);
                else
                    printf("The code had been optimized\n");
            }
            else if (line[2] == '0')
            {
                printf("The code had been optimized to %s", line);
            }
            else
            {
                 printf("The code had been optimized\n");
            }
        }
        else if (line[3] == '/' && (line[2] == '0' || line[4] == '1'))
        {
            if (line[4] == '1')
            {
                if (line[0] != line[2])
```

```
                    printf("The code had been optimized to %c=%c\n", li
ne[0], line[2]);
                else
                    printf("The code had been optimized\n");
            }
            else if (line[4] == '1')
            {
                printf("The code had been optimized to %c=0\n", line[0]
);
            }
            else
                    printf("The code had been optimized\n");
        }
        else if (line[0] == 'p' && line[1] == 'o' && line[2] == 'w')
        {
            if (line[6] == '2')
            {
                printf("The code had been optimized to %c=%c*%c\n", lin
e[4], line[4], line[4]);
            }
            else
            {
                 printf("The code had been optimized\n");
            }
        }
        else
        {
                printf("The code had been optimized\n");
        }
    }
    fclose(fin);
    return 0;
```

Output:



Learning Outcome:

- I’ve learnt how to implement the code optimizer and analyse the code written in C and tried to optimize the code and memory by removing the useless arithmetic operations.
- I’ve learnt how to remove the unwanted assignment statement which affects the time and space complexity of the program.
- I’ve learnt to convert a C code which has redundant and unoptimized statements into an optimized program.