Exp No: 10 **Date:** 12-03-2025
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Experiment – 10

Aim: Implement a Machine Code for a given Intermediate Code.

Program:

Exp-10.c:

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
int label[20];
int no = 0;

int check_label(int k) {
        int i;
        for (i = 0; i < no; i++) {
        if (k == label[i])
        return 1;
        }
        return 0;
}

int main() {
        FILE *fp1, *fp2;
        char fname[10], op[10], ch;
        char operand1[8], operand2[8], result[8];
        int i = 0, j = 0;
        printf("\n Enter filename of the intermediate code");
        scanf("%s", &fname);
        fp1 = fopen(fname, "r");
        fp2 = fopen("target.txt", "w");
```

```
if (fp1 == NULL || fp2 == NULL) {
printf("\n Error opening the file");
exit(0);
}
while (!feof(fp1)) {
fprintf(fp2, "\n");
fscanf(fp1, "%s", op);
i++;
if (check_label(i))
fprintf(fp2, "\nlabel#%d", i);
if (strcmp(op, "print") == 0) {
fscanf(fp1, "%s", result);
fprintf(fp2, "\n\t OUT %s", result);
}
if (strcmp(op, "goto") == 0) {
fscanf(fp1, "%s %s", operand1, operand2);
fprintf(fp2, "\n\t JMP %s,label#%s", operand1, operand2);
label[no++] = atoi(operand2);
}
if (strcmp(op, "[]=") == 0) {
fscanf(fp1, "%s %s %s", operand1, operand2, result);
fprintf(fp2, "\n\t STORE %s[%s],%s", operand1, operand2, result);
}
if (strcmp(op, "uminus") == 0) {
fscanf(fp1, "%s %s", operand1, result);
fprintf(fp2, "\n\t LOAD -%s,R1", operand1);
fprintf(fp2, "\n\t STORE R1,%s", result);
}
switch (op[0]) {
case '*':
```

```
fscanf(fp1, "%s %s %s", operand1, operand2, result);
fprintf(fp2, "\n \t LOAD%s,R0", operand1);
fprintf(fp2, "\n \t LOAD%s,R1", operand2);
fprintf(fp2, "\n \t MUL R1,R0");
fprintf(fp2, "\n \t STORE R0,%s", result);
break;
case '+':
fscanf(fp1, "%s %s%s", operand1, operand2, result);
fprintf(fp2, "\n \t LOAD %s,R0", operand1);
fprintf(fp2, "\n \t LOAD %s,R1", operand2);
fprintf(fp2, "\n \t ADD R1,R0");
fprintf(fp2, "\n \t STORE R0,%s", result);
break;
case '-':
fscanf(fp1, "%s %s %s", operand1, operand2, result);
fprintf(fp2, "\n\t LOAD %s,R0", operand1);
fprintf(fp2, "\n \t LOAD %s,R1", operand2);
fprintf(fp2, "\n \t SUB R1,R0");
fprintf(fp2, "\n \t STORE R0,%s", result);
break;
case '/':
fscanf(fp1, "%s %s s", operand1, operand2, result);
fprintf(fp2, "\n \t LOAD %s,R0", operand1);
fprintf(fp2, "\n \t LOAD %s,R1", operand2);
fprintf(fp2, "\n \t DIV R1,R0");
fprintf(fp2, "\n \t STORE R0,%s", result);
break;
case '%':
fscanf(fp1, "%s %s %s", operand1, operand2, result);
fprintf(fp2, "\n \t LOAD %s,R0", operand1);
```

```
fprintf(fp2, "\n \t LOAD %s,R1", operand2);
fprintf(fp2, "\n \t DIV R1,R0");
fprintf(fp2, "\n \t STORE R0,%s", result);
break;
case '=':
fscanf(fp1, "%s %s", operand1, result);
fprintf(fp2, "\n\t STORE %s %s", operand1, result);
break;
case '>':
j++;
fscanf(fp1, "%s %s %s", operand1, operand2, result);
fprintf(fp2, "\n \t LOAD %s,R0", operand1);
fprintf(fp2, "\n\t JGT %s,label#%s", operand2, result);
label[no++] = atoi(result);
break;
case '<':
fscanf(fp1, "%s %s %s", operand1, operand2, result);
fprintf(fp2, "\n \t LOAD %s,R0", operand1);
fprintf(fp2, "\n\t JLT %s,label#%d", operand2, result);
label[no++] = atoi(result);
break;
}
}
fclose(fp2);
fclose(fp1);
fp2 = fopen("target.txt", "r");
if (fp2 == NULL) {
printf("Error opening the file\n");
exit(0);
}
```

```
        do {
        ch = fgetc(fp2);
        printf("%c", ch);
        } while (ch != EOF);
        fclose(fp1);
        return 0;
}
```

intput.txt:

```
=t1 2
[]=a 0 1
[]=a 1 2
[]=a 2 3
*t1 6 t2
+a[2] t2 t3
-a[2] t1 t2
/t3 t2 t2
uminus t2 t2
print t2
goto t2 t3
=t3 99
uminus 25 t2
*t2 t3 t3
uminus t1 t1
+t1 t3 t4
print t4
```

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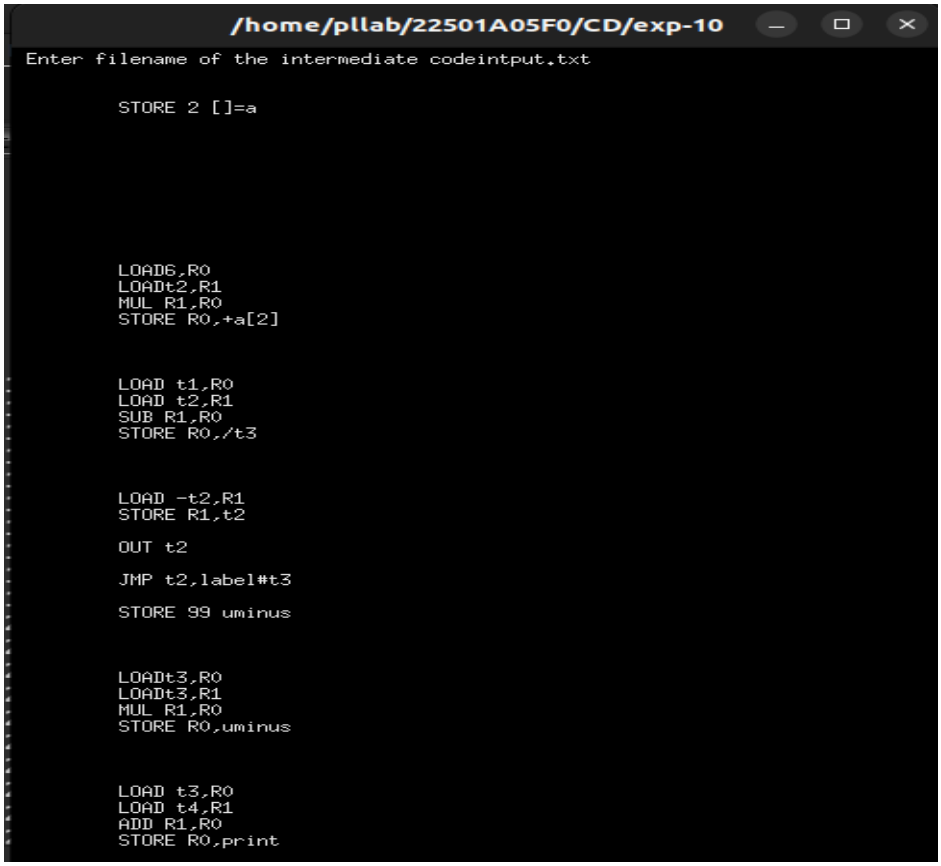
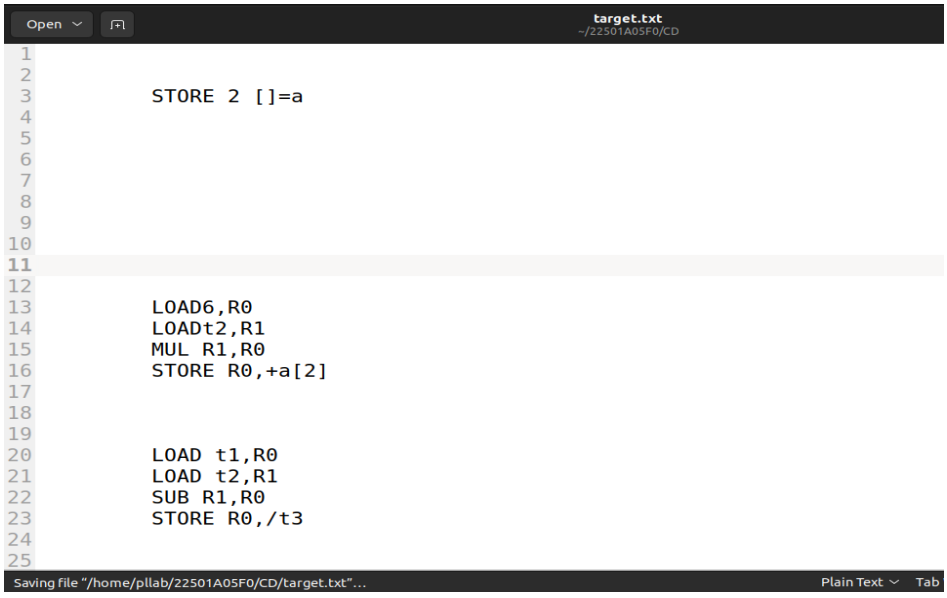
Output:



target.txt:



Conclusion: Machine code for given intermediate code has been implemented successfully.