

TWO PASS ASSWMBLER-PASS1

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

int hex_to_deci(char hex[20])
{
    int decimal = 0;
    int i,len,val;
    len = strlen(hex) - 1;
    for(i=0;hex[i]!='\0';i++)
    {
        if(hex[i] >= '0' && hex[i] <= '9')
        {
            val = hex[i] - 48;
        }
        else if(hex[i] >= 'a' && hex[i] <= 'f')
        {
            val = hex[i] - 97 + 10;
        }
        else if(hex[i] >= 'A' && hex[i] <= 'F')
        {
            val = hex[i] - 65 + 10;
        }
        decimal += pow(16,len) * val;
        len--;
    }
    return(decimal);
}

char* deci_to_hex(int decimal)
{
    int quotient,remainder;
    int i,j,len;
    char temp;
    static char hex[20];
    quotient = decimal;
    i = 0;
    while(quotient > 0)
    {
        remainder = quotient % 16;
        if(remainder <= 9)
        {
            hex[i] = 48 + remainder;
        }
        else
        {
            temp = remainder - 10;
            hex[i] = 55 + temp;
        }
        i++;
        quotient = quotient / 16;
    }
    hex[i] = '\0';
    return(hex);
}
```

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hex[i] = 55 + remainder;
}
quotient /= 16;
i++;
}
hex[i] = '\0';
len = strlen(hex);
for(i=0,j=len-1;i<len/2;i++,j--)
{
temp = hex[i];
hex[i] = hex[j];
hex[j] = temp;
}
return hex;
}
void main()
{
FILE *f1,*f2,*f3;
char label[20],opcode[20],operand[20],address[20];
int curr_address;
char start_address[20];
f1 = fopen("intermediate.txt","r");
f2 = fopen("symtab.txt","w");
f3 = fopen("temp.txt","w");
while (fscanf(f1,"%s%s%s",label,opcode,operand) == 3)
{
if(strcmp(opcode,"START") == 0)
{
strcpy(start_address,operand);
curr_address = hex_to_deci(start_address);
fprintf(f3,"%s\t\t%s\t\t%s\t\t%s\n",label,opcode,operand,"----");
}
else
{
if(strcmp(label,"----") != 0)
{
fprintf(f2,"%s\t%s\n",label,deci_to_hex(curr_address));
}
fprintf(f3,"%s\t\t%s\t\t%s\t\t%s\n",label,opcode,operand,deci_to_hex(curr_address));

if(strcmp(opcode,"WORD") == 0)
{
curr_address += 3;
}
else if(strcmp(opcode,"RESW") == 0)
{

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curr_address += 3 * atoi(operand);
}
else
{
curr_address += 3;
}
}
}
fclose(f1);
fclose(f2);
fclose(f3);
f3 = fopen("temp.txt", "r");
printf("-----Location Counter value for each statement-----\n");
while(fscanf(f3, "%s%s%s%s", label, opcode, operand, address) == 4)
{
printf("%s\t\t%s\t\t%s\t\t%s\n", label, opcode, operand, address);
}
fclose(f3);
}

```

OUTPUT

```

aswin@Aswin:~/SS Lab$ gcc -o asw pass1.c -lm
aswin@Aswin:~/SS Lab$ ./asw
-----Location Counter value for each statement-----
TEST          START          4000          ----
FIRST         LDA           FIVE           4000
----         STA           ALPHA          4003
ALPHA         RESW           2             4006
FIVE          WORD           5             400C
----         END           START          400F
aswin@Aswin:~/SS Lab$ 

```

INTERMEDIATE.txt

```

1  TEST  START 4000
2  FIRST LDA  FIVE
3  ---- STA  ALPHA
4  ALPHA RESW 2
5  FIVE  WORD 5
6  ---- END  START

```

Symbtab.txt

1	FIRST	4000
2	ALPHA	4006
3	FIVE	400C
4		