Practical No: 10

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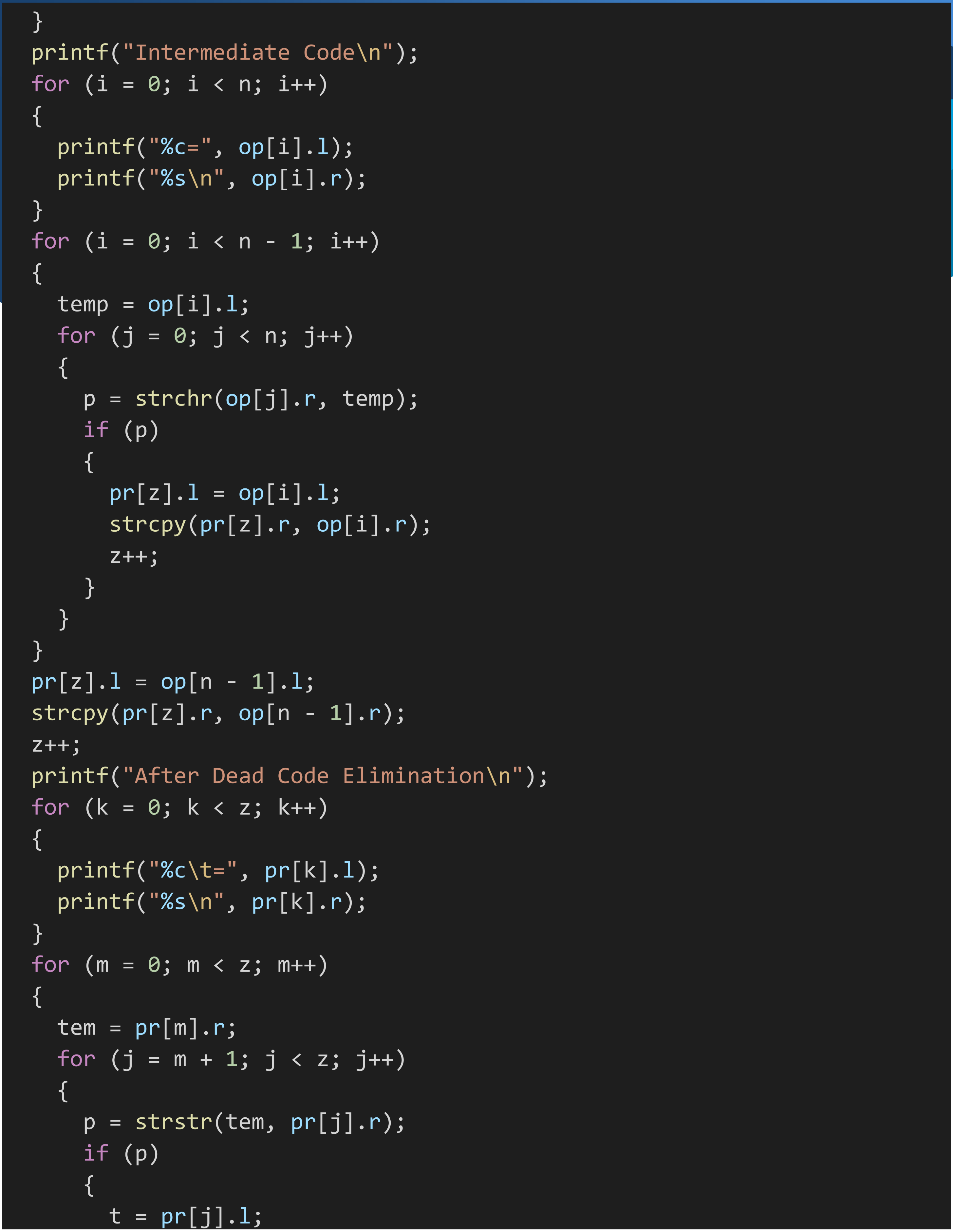
Subject : Compiler Construction

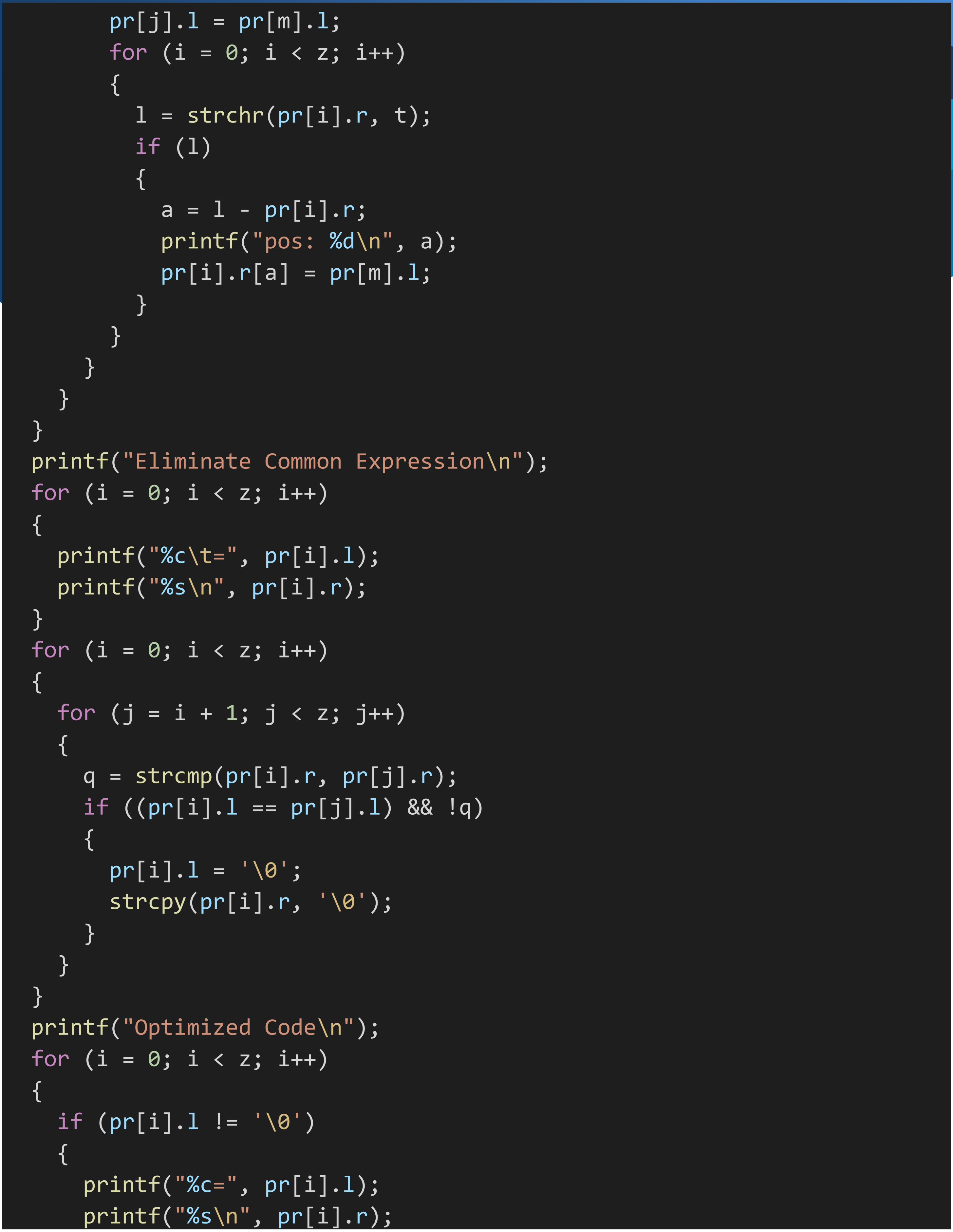
AIM: To implement Code Optimization techniques.

File 1: Practical10.c

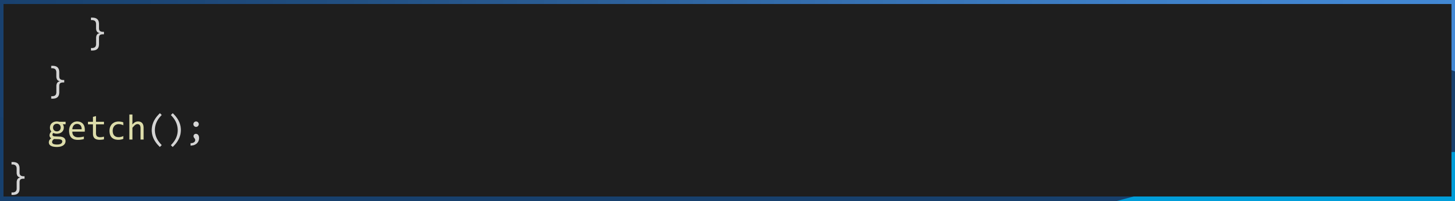
```
#include <stdio.h>
#include <conio.h>
#include <string.h>
struct op
{
  char l;
  char r[20];
} op[10], pr[10];
void main()
{
  int a, i, k, j, n, z = 0, m, q;
  char *p, *l;
  char temp, t;
  char *tem;
  printf("Enter the Number of Values:");
  scanf("%d", &n);
  for (i = 0; i < n; i++)
  {
    printf("left: ");
    op[i].l = getche();
    printf("\tright: ");
    scanf("%s", op[i].r);
```



```
}
printf("Intermediate Code\n");
for (i = 0; i < n; i++)
{
  printf("%c=", op[i].l);
  printf("%s\n", op[i].r);
}
for (i = 0; i < n - 1; i++)
{
  temp = op[i].l;
  for (j = 0; j < n; j++)
  {
    p = strchr(op[j].r, temp);
    if (p)
    {
      pr[z].l = op[i].l;
      strcpy(pr[z].r, op[i].r);
      z++;
    }
  }
}
pr[z].l = op[n - 1].l;
strcpy(pr[z].r, op[n - 1].r);
z++;
printf("After Dead Code Elimination\n");
for (k = 0; k < z; k++)
{
  printf("%c\t=", pr[k].l);
  printf("%s\n", pr[k].r);
}
for (m = 0; m < z; m++)
{
  tem = pr[m].r;
  for (j = m + 1; j < z; j++)
  {
    p = strstr(tem, pr[j].r);
    if (p)
    {
      t = pr[j].l;
```

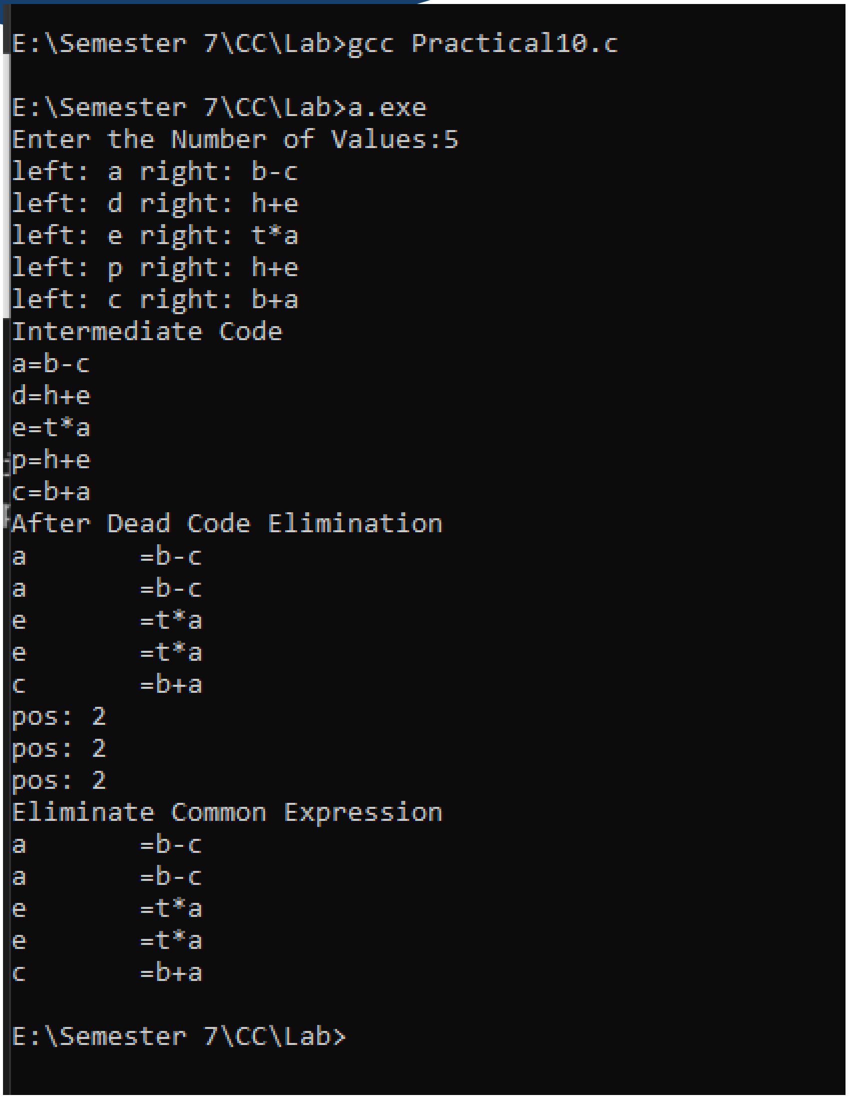


```
      pr[j].l = pr[m].l;
      for (i = 0; i < z; i++)
      {
        l = strchr(pr[i].r, t);
        if (l)
        {
          a = l - pr[i].r;
          printf("pos: %d\n", a);
          pr[i].r[a] = pr[m].l;
        }
      }
    }
  }
}
printf("Eliminate Common Expression\n");
for (i = 0; i < z; i++)
{
  printf("%c\t=", pr[i].l);
  printf("%s\n", pr[i].r);
}
for (i = 0; i < z; i++)
{
  for (j = i + 1; j < z; j++)
  {
    q = strcmp(pr[i].r, pr[j].r);
    if ((pr[i].l == pr[j].l) && !q)
    {
      pr[i].l = '\0';
      strcpy(pr[i].r, '\0');
    }
  }
}
printf("Optimized Code\n");
for (i = 0; i < z; i++)
{
  if (pr[i].l != '\0')
  {
    printf("%c=", pr[i].l);
    printf("%s\n", pr[i].r);
```



```
    }
  }
  getch();
}
```

Execution Sequence:



```
E:\Semester 7\CC\Lab>gcc Practical10.c

E:\Semester 7\CC\Lab>a.exe
Enter the Number of Values:5
left: a right: b-c
left: d right: h+e
left: e right: t*a
left: p right: h+e
left: c right: b+a
Intermediate Code
a=b-c
d=h+e
e=t*a
p=h+e
c=b+a
After Dead Code Elimination
a        =b-c
a        =b-c
e        =t*a
e        =t*a
c        =b+a
pos: 2
pos: 2
pos: 2
Eliminate Common Expression
a        =b-c
a        =b-c
e        =t*a
e        =t*a
c        =b+a

E:\Semester 7\CC\Lab>
```

Conclusion:

From this practical I learned how to make a C program for Code Optimizations.