Programming Projects

1. Ans:

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

int isPalRec(char str[], int s, int e)
{
        if (e==0 || s >= e)
        return 1;
        else if (str[s] == str[e])
        return isPalRec(str, s + 1, e - 1);
        else
        return 0;
}

int main()
{
        char str[50];
        int n;
        printf("Enter a string >");
        gets(str);
        n = strlen(str);
        if (isPalRec(str, 0, n - 1))
        printf("Palindrome.");
        else
        printf("Not Palindrome.");

        return 0;
}
```

O/P

Enter a string >level
Palindrome.
Enter a string >r
Palindrome.
Enter a string >PS
Not Palindrome.
Enter a string >pspd
Not Palindrome.

2. Ans:

```c
#include <stdio.h>
int func(int);

void main()
{
        int x, result;
        printf("\nEnter the value of x > ");
        scanf("%d", &x);
        result = func(x);
        printf("Result :- %d\n", result);
}
```

```c
int func(int x)
{
        if(x <= 0)
                return 0;
        else
         return (2 + func(x - 1));
}
```

O/P

Enter the value of x > -2
Result :- 0

Enter the value of x > 0
Result :- 0

Enter the value of x > 3
Result :- 6

Enter the value of x > 9
Result :- 18

3. Ans:

```c
#include <stdio.h>

typedef struct{
  int atom_num;
  char name[20];
  char symbol[10];
  char class[50];
  double atom_wt;
  int num_elect[7];
} element_t;

int
scan_element(element_t *elem){
int result, i;
result = scanf("%d%s%s%s%lf", &elem->atom_num, elem->name, elem->symbol, elem->class, &elem->atom_wt);
for(i=0;i<7;i++)
scanf("%d",&elem->num_elect[i]);
if (result == 5 && i==7)
result = 1;
else
result = 0;
return (result);
}

void
print_element(element_t el){
int i;
printf(" Atomic Number: %d\n", el.atom_num);
printf(" Name : %s\n", el.name);
printf(" Symbol : %s\n", el.symbol);
printf(" Class : %s\n", el.class);
printf(" Atomic Weight : %f\n", el.atom_wt);
printf(" Number of electrons in each shell :");
for(i=0;i<7;i++)
```

```c
        printf("%d ",el.num_elect[i]);
    }

int main()
{
    element_t element;
    int flag=1;
    printf("Enter the atomic number, name, chemical symbol, class, atomic weight, and number of electrons in each shell \n");
    if(scan_element(&element))
    printf("\nThe components of the elements are successfully read\n\n");
    else{
    printf("\nOne or more components of the elements are not successfully read\n\n");
    flag = 0;}
    if(flag){
    printf("The components of the elements are as follows:\n");
    print_element(element);}
    return 0;
}
```

O/P

Enter the atomic number, name, chemical symbol, class, atomic weight, and number of electrons in each shell
11 Sodium Na alkali_metal 22.9898 2 8 1 0 0 0 0

The components of the elements are successfully read

The components of the elements are as follows:
Atomic Number: 11
Name : Sodium
Symbol : Na
Class : alkali_metal
Atomic Weight : 22.989800
Number of electrons in each shell :2 8 1 0 0 0 0