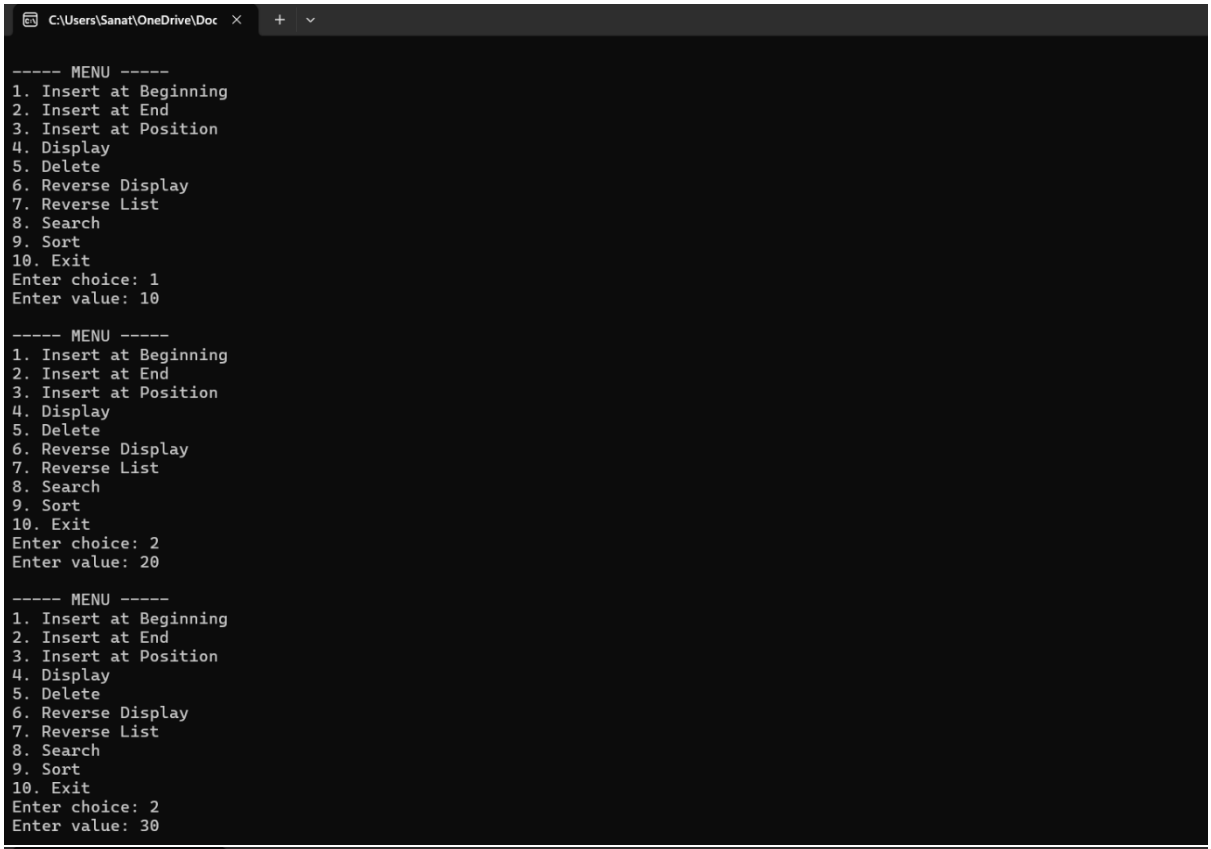
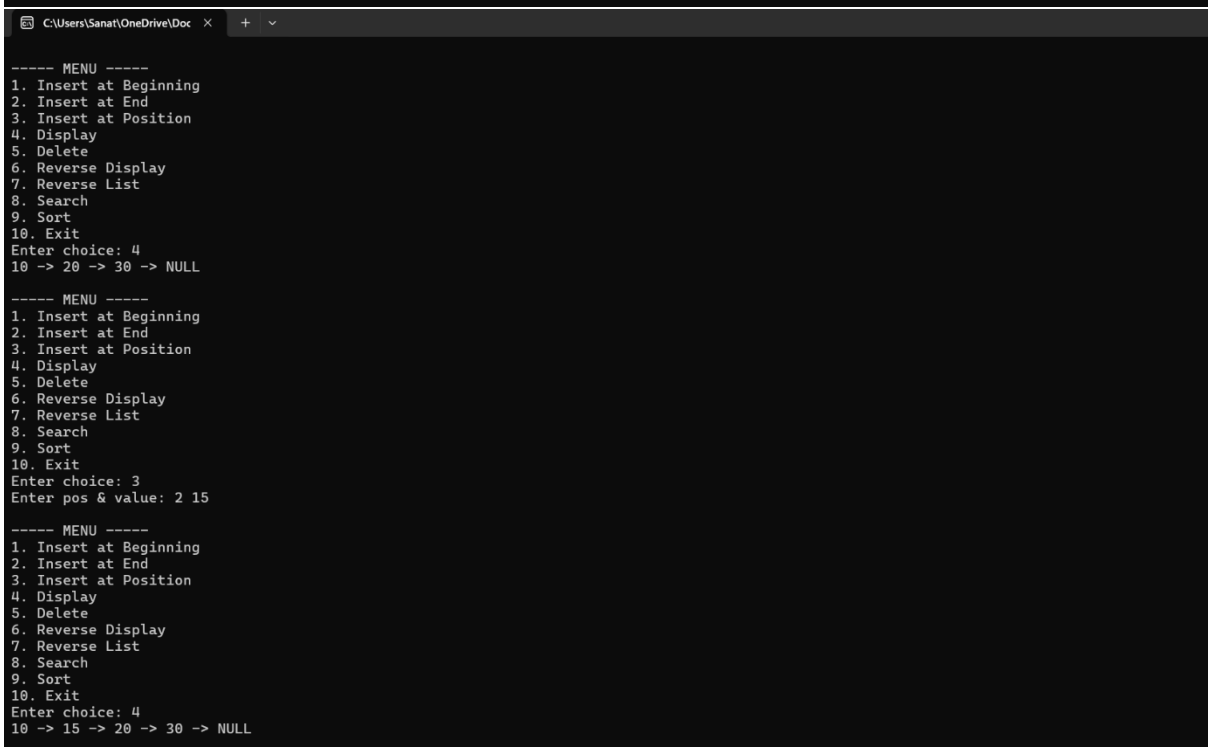
```
        head = temp->next;
        free(temp);
        return;
    }
    while (temp != NULL && temp->data != x) {
        prev = temp;
        temp = temp->next;
    }
    if (temp == NULL) {
        printf("Value not found!\n");
        return;
    }
    prev->next = temp->next;
    free(temp);
}
void reverseDisplay(struct Node *node) {
    if (node == NULL) return;
    reverseDisplay(node->next);
    printf("%d -> ", node->data);
}
void reverseList() {
    struct Node *prev = NULL, *curr = head, *next = NULL;
    while (curr != NULL) {
        next = curr->next;
        curr->next = prev;
        prev = curr;
        curr = next;
    }
    head = prev;
}
```

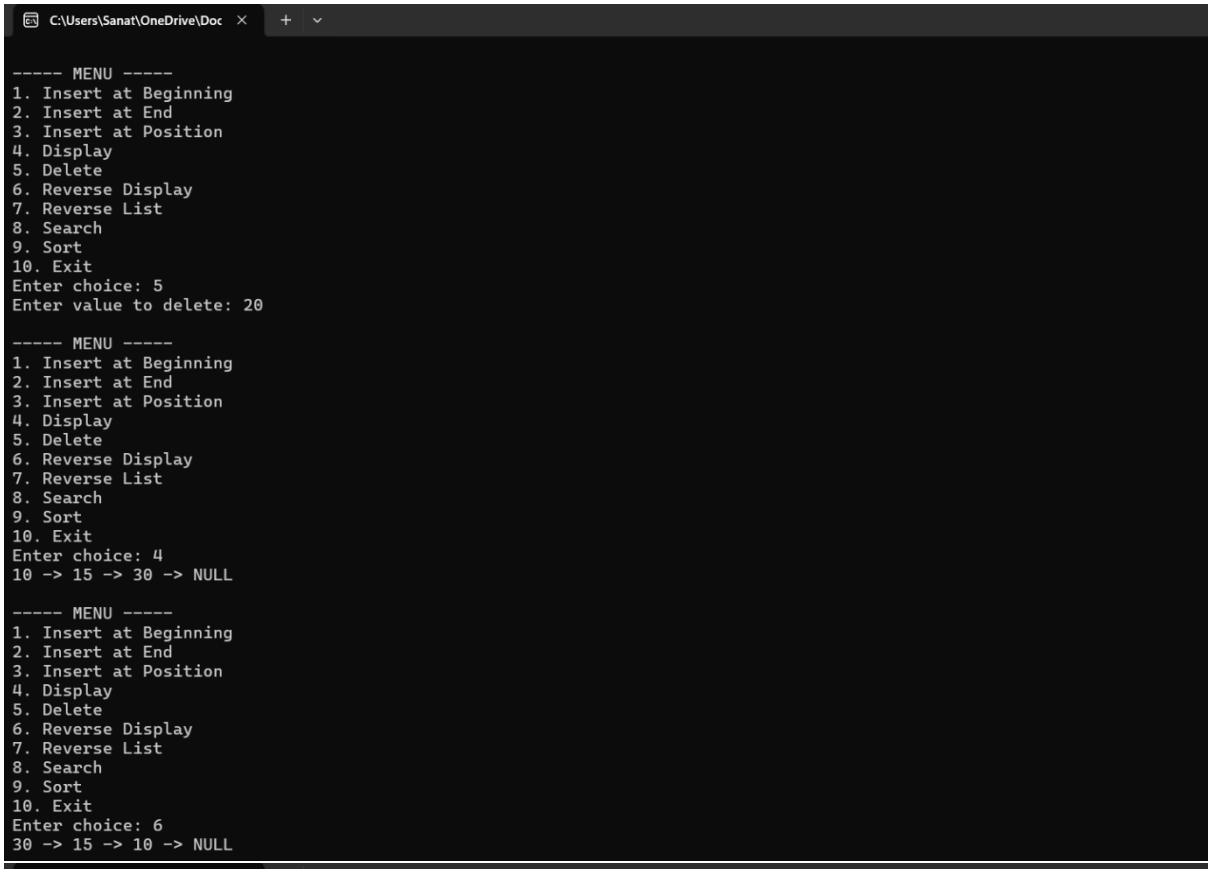
```
void search(int x) {
    struct Node *temp = head;
    int pos = 1;
    while (temp != NULL) {
        if (temp->data == x) {
            printf("Found at position %d\n", pos);
            return;
        }
        temp = temp->next;
        pos++;
    }
    printf("Not found!\n");
}
void selectionSort() {
    struct Node *i, *j;
    for (i = head; i != NULL; i = i->next) {
        for (j = i->next; j != NULL; j = j->next) {
            if (i->data > j->data) {
                int temp = i->data;
                i->data = j->data;
                j->data = temp;
            }
        }
    }
}
int main() {
    int choice, val, pos;
    while (1) {
        printf("\n----- MENU -----\n");
        printf("1. Insert at Beginning\n2. Insert at End\n3. Insert at Position\n");
```

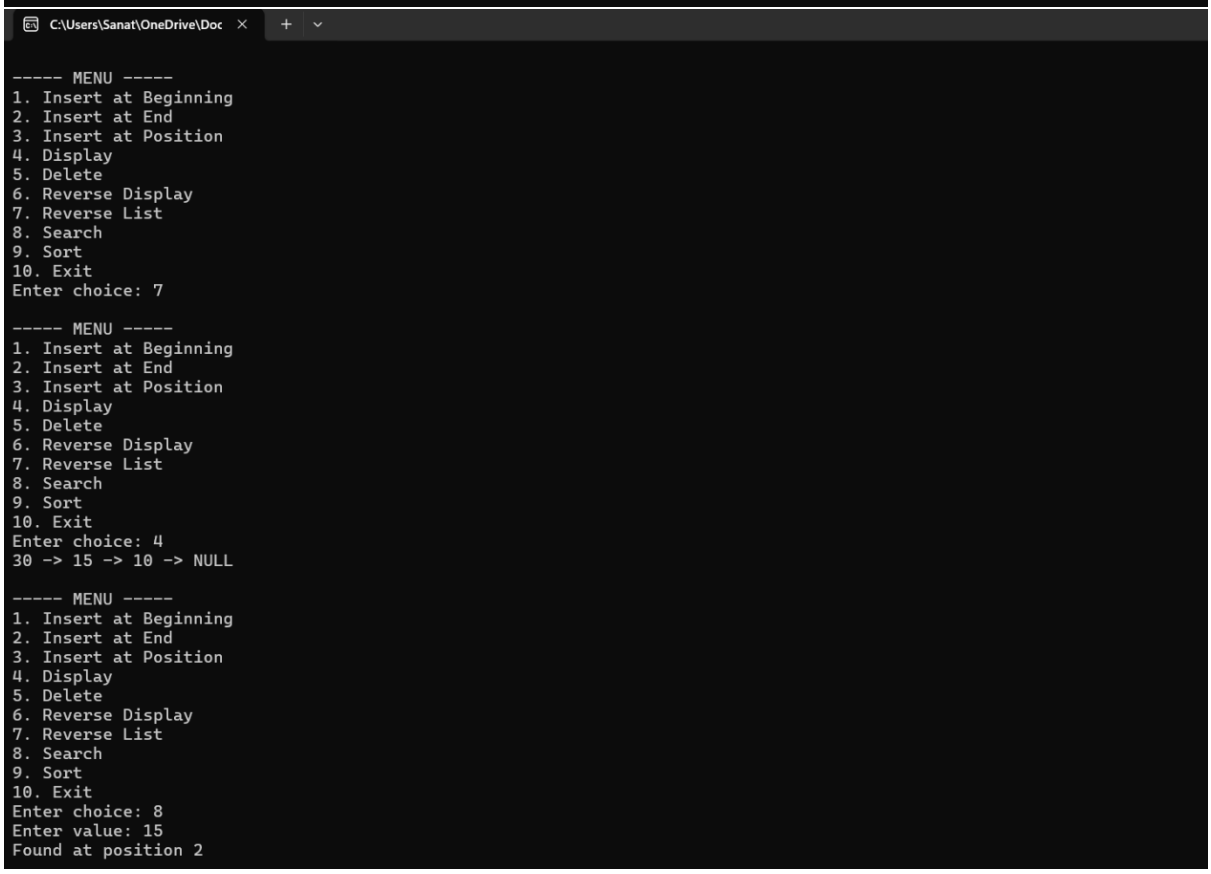
```
        printf("4. Display\n5. Delete\n6. Reverse Display\n7. Reverse List\n");
        printf("8. Search\n9. Sort\n10. Exit\n");
        printf("Enter choice: ");
        scanf("%d", &choice);
        switch (choice) {
            case 1: printf("Enter value: "); scanf("%d", &val); insertBeg(val); break;
            case 2: printf("Enter value: "); scanf("%d", &val); insertEnd(val); break;
            case 3: printf("Enter pos & value: "); scanf("%d%d", &pos, &val); insertPos(pos, val);
break;
            case 4: display(); break;
            case 5: printf("Enter value to delete: "); scanf("%d", &val); deleteValue(val); break;
            case 6: reverseDisplay(head); printf("NULL\n"); break;
            case 7: reverseList(); break;
            case 8: printf("Enter value: "); scanf("%d", &val); search(val); break;
            case 9: selectionSort(); break;
            case 10: exit(0);
            default: printf("Invalid choice!\n");
        }
    }
}
```

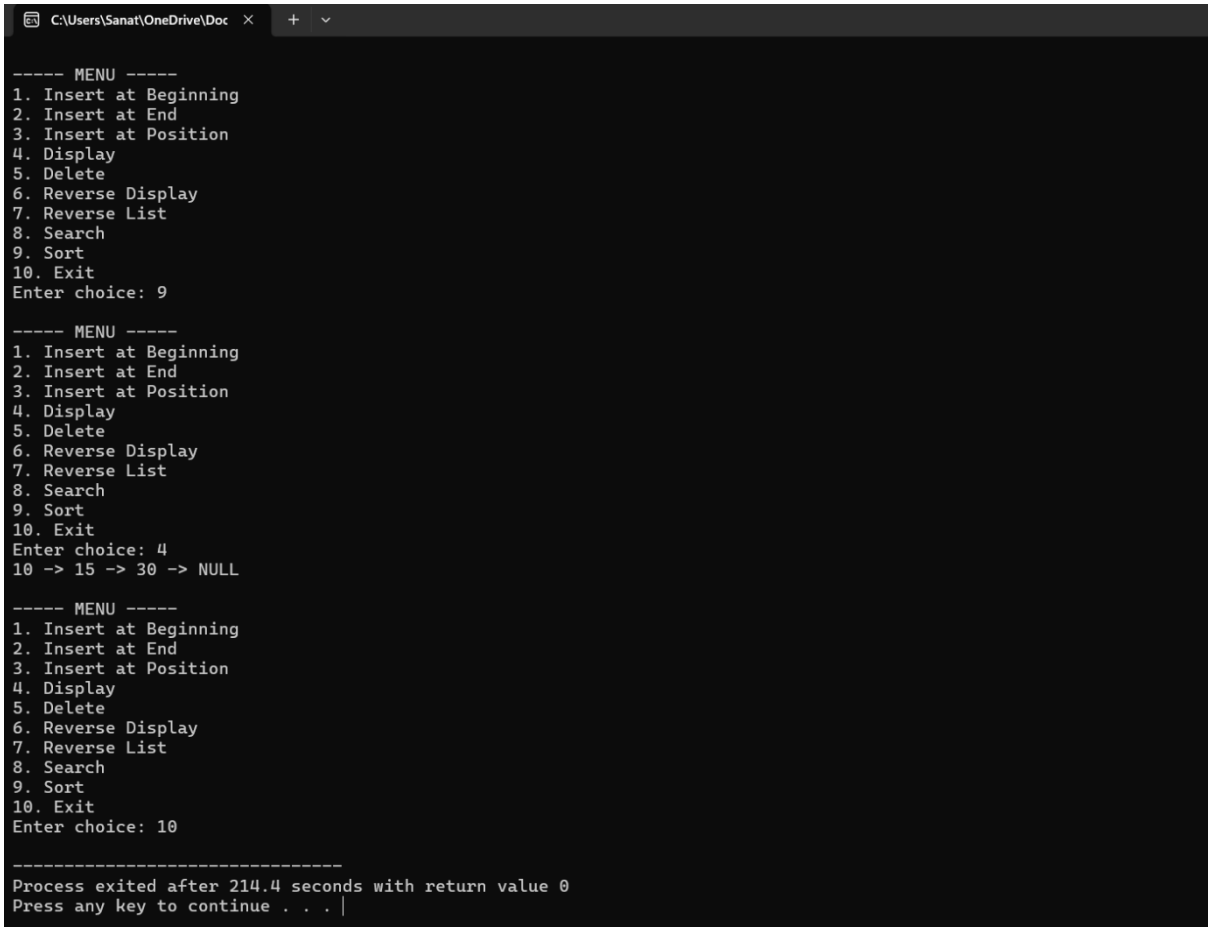
Output :-


C:\Users\Sanat\OneDrive\Doc
----- MENU -----
1. Insert at Beginning
2. Insert at End
3. Insert at Position
4. Display
5. Delete
6. Reverse Display
7. Reverse List
8. Search
9. Sort
10. Exit
Enter choice: 1
Enter value: 10
----- MENU -----
1. Insert at Beginning
2. Insert at End
3. Insert at Position
4. Display
5. Delete
6. Reverse Display
7. Reverse List
8. Search
9. Sort
10. Exit
Enter choice: 2
Enter value: 20
----- MENU -----
1. Insert at Beginning
2. Insert at End
3. Insert at Position
4. Display
5. Delete
6. Reverse Display
7. Reverse List
8. Search
9. Sort
10. Exit
Enter choice: 2
Enter value: 30


C:\Users\Sanat\OneDrive\Doc
----- MENU -----
1. Insert at Beginning
2. Insert at End
3. Insert at Position
4. Display
5. Delete
6. Reverse Display
7. Reverse List
8. Search
9. Sort
10. Exit
Enter choice: 4
10 -> 20 -> 30 -> NULL
----- MENU -----
1. Insert at Beginning
2. Insert at End
3. Insert at Position
4. Display
5. Delete
6. Reverse Display
7. Reverse List
8. Search
9. Sort
10. Exit
Enter choice: 3
Enter pos & value: 2 15
----- MENU -----
1. Insert at Beginning
2. Insert at End
3. Insert at Position
4. Display
5. Delete
6. Reverse Display
7. Reverse List
8. Search
9. Sort
10. Exit
Enter choice: 4
10 -> 15 -> 20 -> 30 -> NULL


C:\Users\Sanat\OneDrive\Doc
----- MENU -----
1. Insert at Beginning
2. Insert at End
3. Insert at Position
4. Display
5. Delete
6. Reverse Display
7. Reverse List
8. Search
9. Sort
10. Exit
Enter choice: 5
Enter value to delete: 20
----- MENU -----
1. Insert at Beginning
2. Insert at End
3. Insert at Position
4. Display
5. Delete
6. Reverse Display
7. Reverse List
8. Search
9. Sort
10. Exit
Enter choice: 4
10 -> 15 -> 30 -> NULL
----- MENU -----
1. Insert at Beginning
2. Insert at End
3. Insert at Position
4. Display
5. Delete
6. Reverse Display
7. Reverse List
8. Search
9. Sort
10. Exit
Enter choice: 6
30 -> 15 -> 10 -> NULL


C:\Users\Sanat\OneDrive\Doc
----- MENU -----
1. Insert at Beginning
2. Insert at End
3. Insert at Position
4. Display
5. Delete
6. Reverse Display
7. Reverse List
8. Search
9. Sort
10. Exit
Enter choice: 7
----- MENU -----
1. Insert at Beginning
2. Insert at End
3. Insert at Position
4. Display
5. Delete
6. Reverse Display
7. Reverse List
8. Search
9. Sort
10. Exit
Enter choice: 4
30 -> 15 -> 10 -> NULL
----- MENU -----
1. Insert at Beginning
2. Insert at End
3. Insert at Position
4. Display
5. Delete
6. Reverse Display
7. Reverse List
8. Search
9. Sort
10. Exit
Enter choice: 8
Enter value: 15
Found at position 2


C:\Users\Sanat\OneDrive\Doc
----- MENU -----
1. Insert at Beginning
2. Insert at End
3. Insert at Position
4. Display
5. Delete
6. Reverse Display
7. Reverse List
8. Search
9. Sort
10. Exit
Enter choice: 9
----- MENU -----
1. Insert at Beginning
2. Insert at End
3. Insert at Position
4. Display
5. Delete
6. Reverse Display
7. Reverse List
8. Search
9. Sort
10. Exit
Enter choice: 4
10 -> 15 -> 30 -> NULL
----- MENU -----
1. Insert at Beginning
2. Insert at End
3. Insert at Position
4. Display
5. Delete
6. Reverse Display
7. Reverse List
8. Search
9. Sort
10. Exit
Enter choice: 10

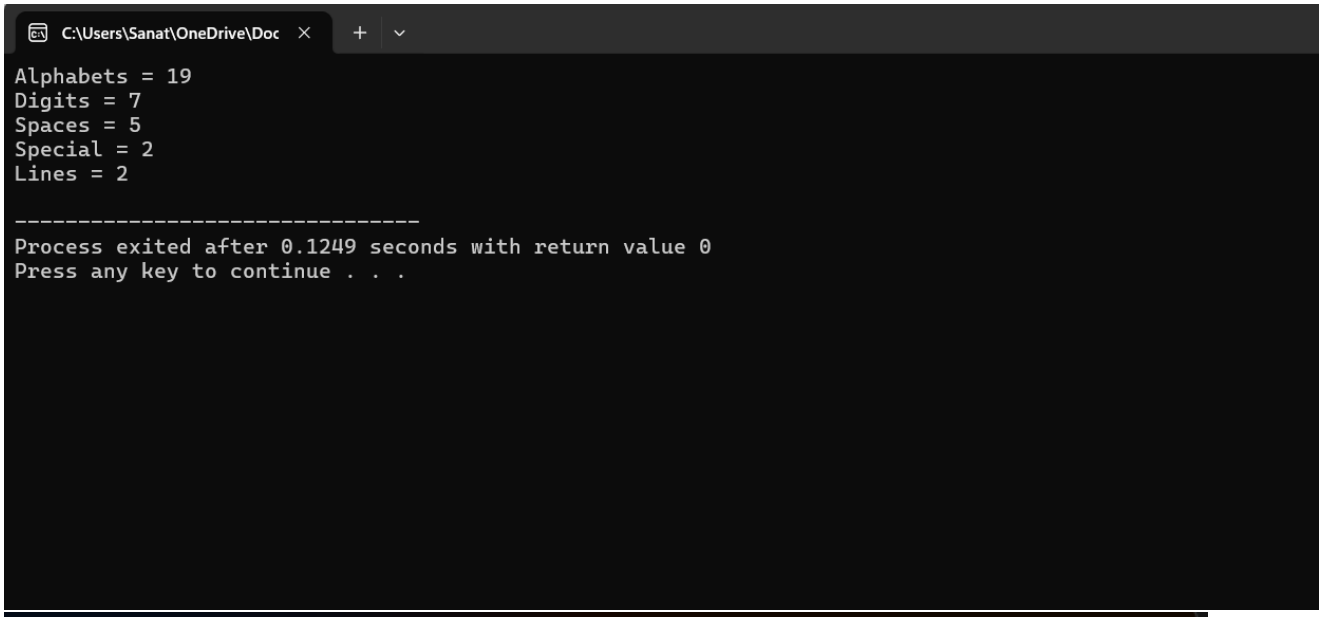
Process exited after 214.4 seconds with return value 0
Press any key to continue . . .

Ques 11 :-

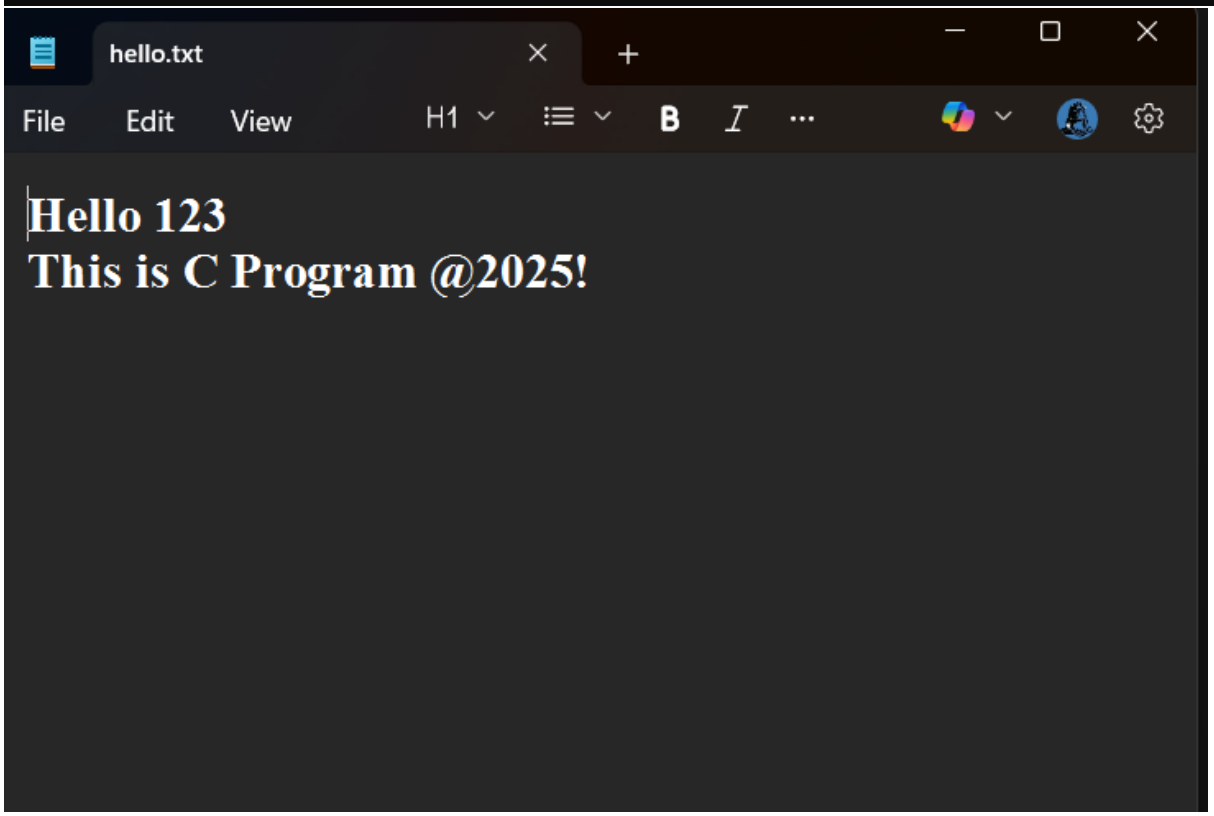
Code :-

```
#include <stdio.h>
#include <ctype.h>
int main() {
   FILE *fp;
   char ch;
   int alph=0, digit=0, space=0, special=0, lines=1;
   fp = fopen("C:hello.txt", "w");
   fprintf(fp, "Hello 123\nThis is C Program @2025!");
   fclose(fp);
   fp = fopen("C:hello.txt", "r");
   while ((ch = fgetc(fp)) != EOF) {
      if (isalpha(ch)) alph++;
      else if (isdigit(ch)) digit++;
      else if (ch == ' ') space++;
      else if (ch == '\n') lines++;
      else special++;
   }
   fclose(fp);
   printf("Alphabets = %d\nDigits = %d\nSpaces = %d\nSpecial = %d\nLines = %d\n",
         alph, digit, space, special, lines);
   return 0;
}
```

Output :-


C:\Users\Sanat\OneDrive\Doc
Alphabets = 19
Digits = 7
Spaces = 5
Special = 2
Lines = 2

Process exited after 0.1249 seconds with return value 0
Press any key to continue . . .

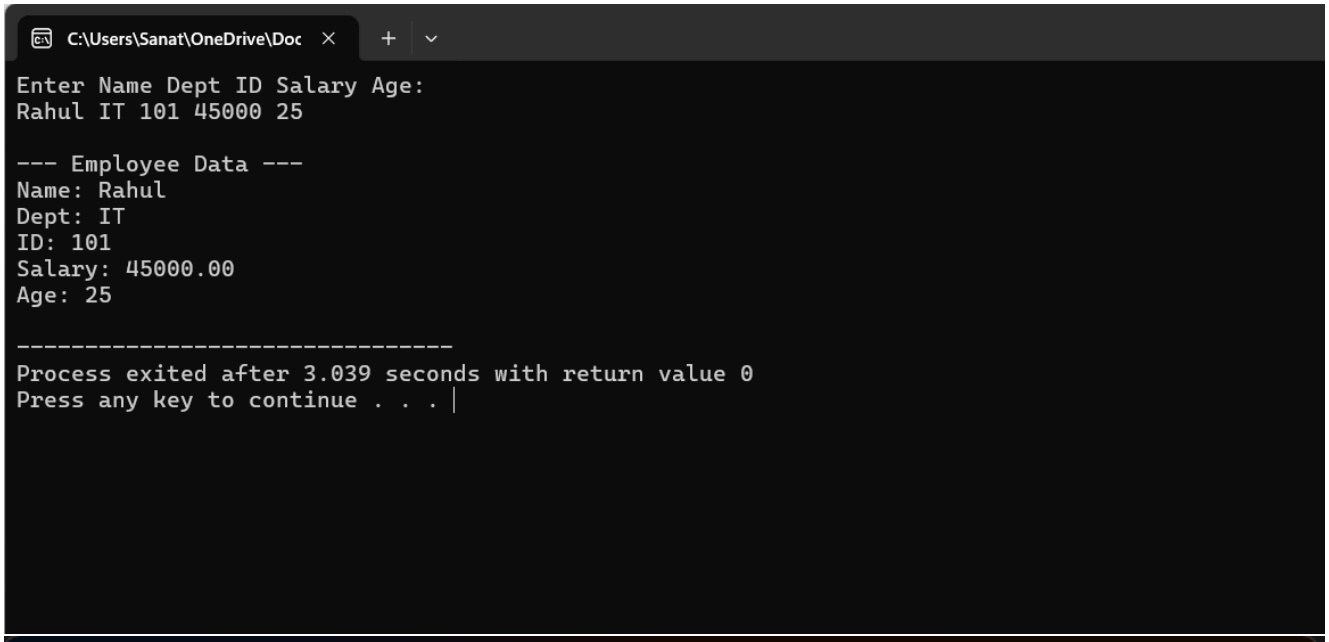

hello.txt
File
Edit
View
H1
Hello 123
This is C Program @2025!

Ques 12 :-

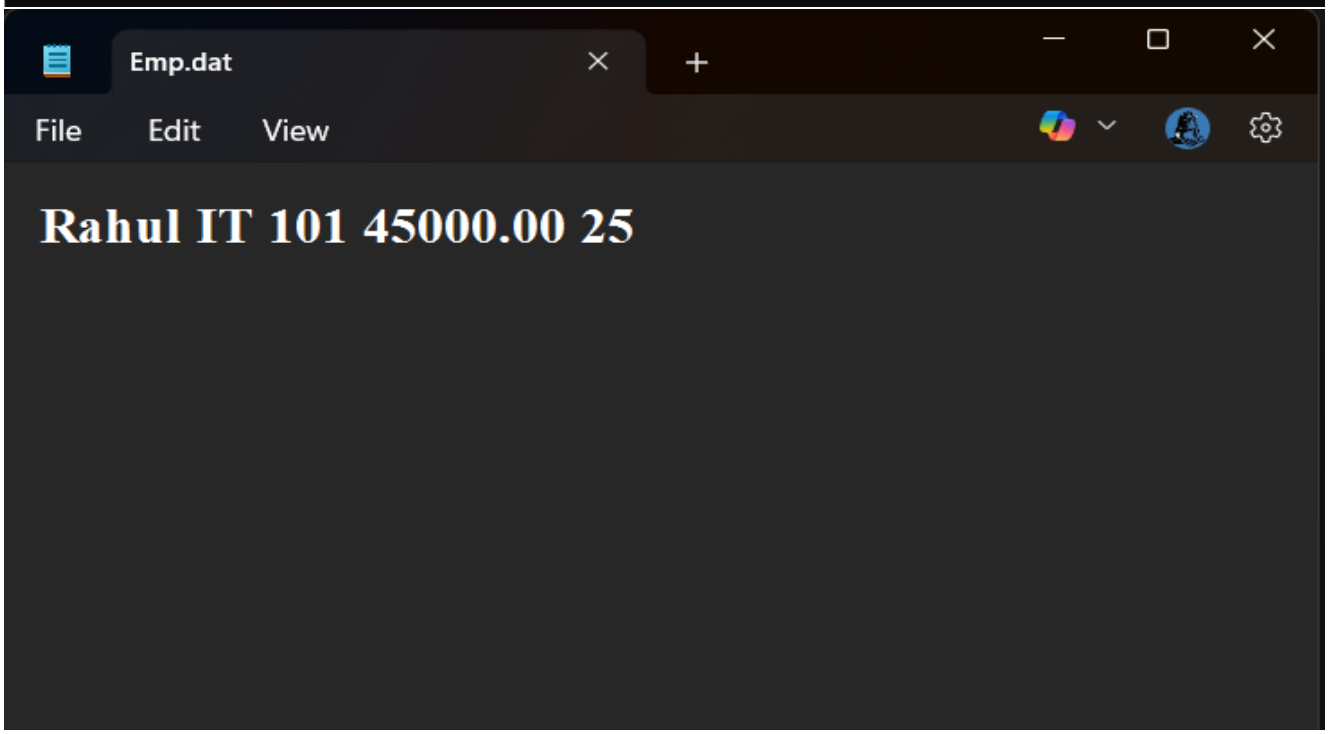
Code :- #include <stdio.h>

```
struct Emp {
    char name[20];
    char dept[20];
    int id;
    float sal;
    int age;
};
int main() {
    FILE *fp;
    struct Emp e;
    fp = fopen("C:Emp.dat", "w");
    printf("Enter Name Dept ID Salary Age:\n");
    scanf("%s %s %d %f %d", e.name, e.dept, &e.id, &e.sal, &e.age);
    fprintf(fp, "%s %s %d %.2f %d", e.name, e.dept, e.id, e.sal, e.age);
    fclose(fp);
    fp = fopen("C:Emp.dat", "r");
    fscanf(fp, "%s %s %d %f %d", e.name, e.dept, &e.id, &e.sal, &e.age);
    printf("\n--- Employee Data ---\n");
    printf("Name: %s\nDept: %s\nID: %d\nSalary: %.2f\nAge: %d\n", e.name, e.dept, e.id,
e.sal, e.age);
    fclose(fp);
    return 0;
}
```

Output :-


C:\Users\Sanat\OneDrive\Doc
Enter Name Dept ID Salary Age:
Rahul IT 101 45000 25
--- Employee Data ---
Name: Rahul
Dept: IT
ID: 101
Salary: 45000.00
Age: 25

Process exited after 3.039 seconds with return value 0
Press any key to continue . . .

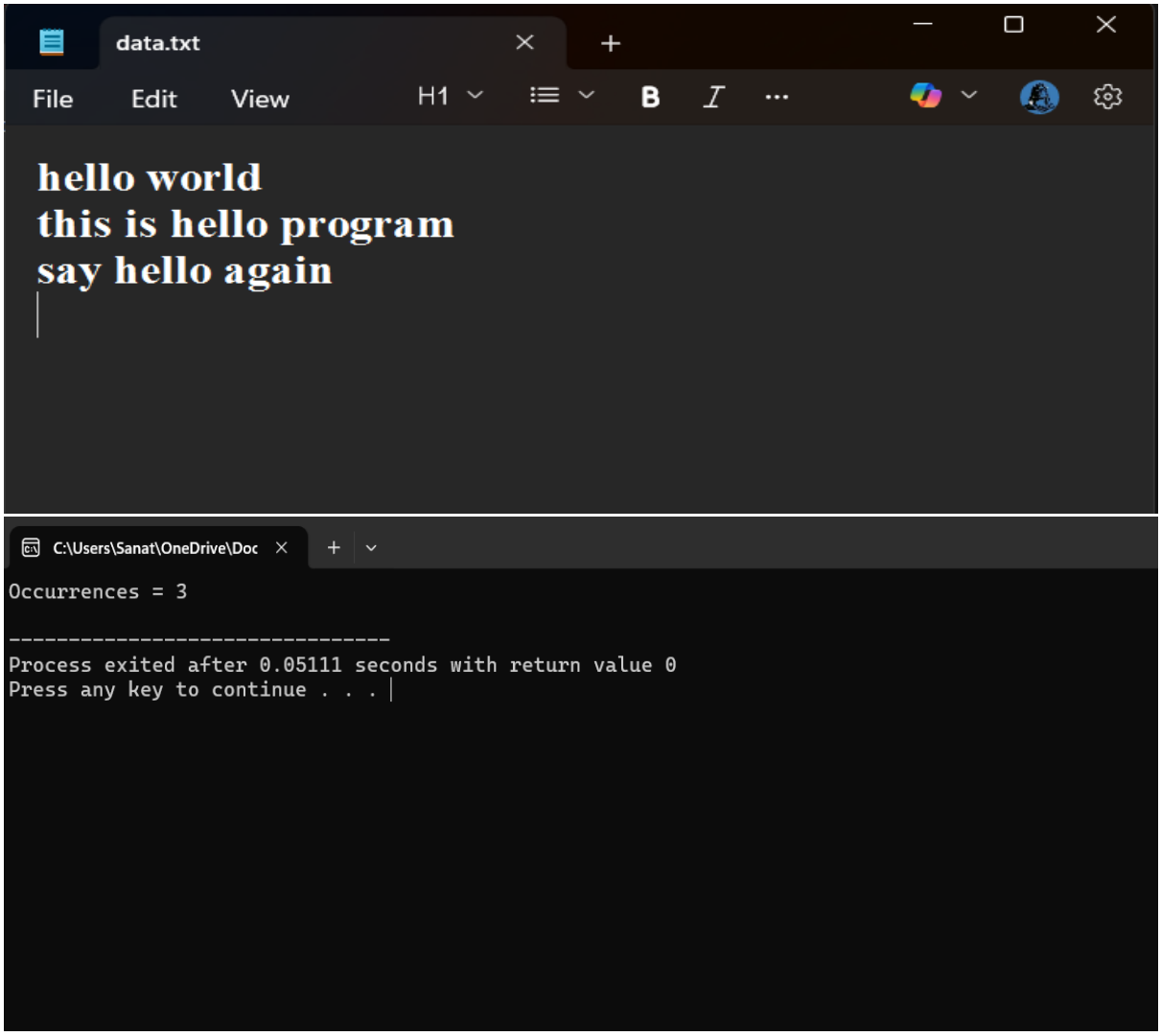

Emp.dat
File
Edit
View
Rahul IT 101 45000.00 25

Ques 13 :-

Code :-

```
#include <stdio.h>
#include <string.h>
int main(int argc, char *argv[]) {
   FILE *fp;
   char str[200], *p;
   int count = 0;
   if (argc != 3) {
      printf("Usage: prog filename substring\n");
      return 0;
   }
   fp = fopen(argv[1], "r");
   if (!fp) {
      printf("File not found!");
      return 0;
   }
   while (fgets(str, 200, fp)) {
      p = strstr(str, argv[2]);
      while (p) {
         count++;
         p = strstr(p + 1, argv[2]);
      }
   }
   printf("Occurrences = %d\n", count);
   fclose(fp);
   return 0;
}
```

Output :-

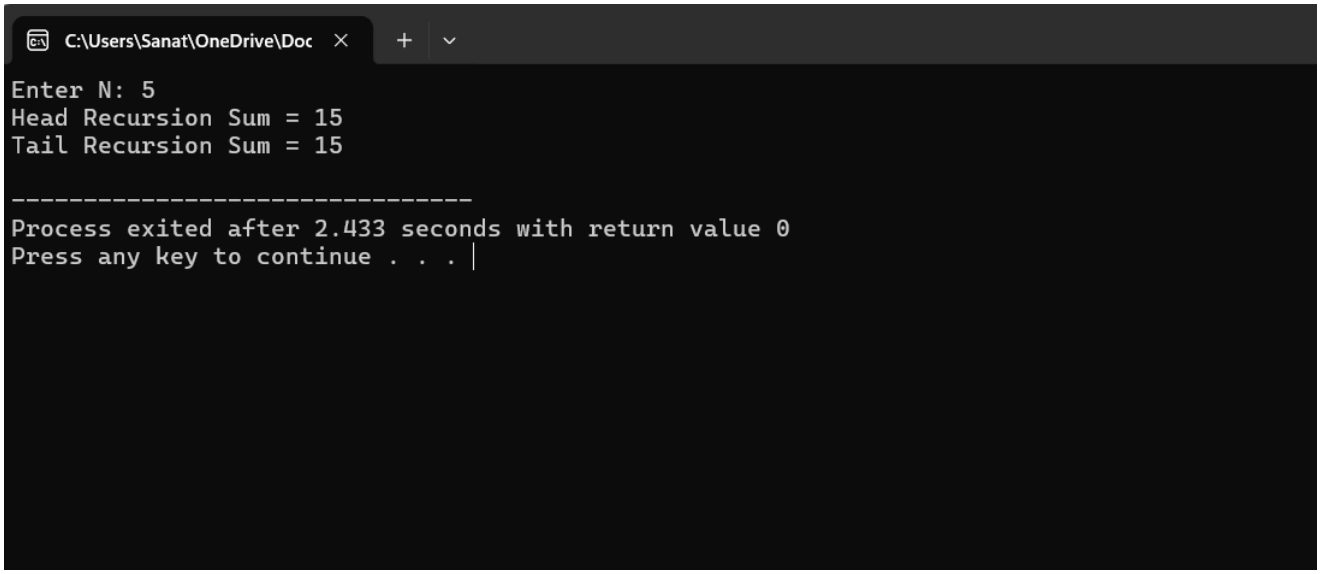

data.txt
File
Edit
View
H1
hello world
this is hello program
say hello again
C:\Users\Sanat\OneDrive\Doc
Occurrences = 3
Process exited after 0.05111 seconds with return value 0
Press any key to continue . . .

Ques 14 :-

Code :- #include <stdio.h>

```
int headSum(int n) {
    if (n == 0) return 0;
    return headSum(n - 1) + n;
}
int tailSum(int n, int acc) {
    if (n == 0) return acc;
    return tailSum(n - 1, acc + n);
}
int main() {
    int n;
    printf("Enter N: ");
    scanf("%d", &n);
    printf("Head Recursion Sum = %d\n", headSum(n));
    printf("Tail Recursion Sum = %d\n", tailSum(n, 0));
    return 0;
}
```

Output :-


C:\Users\Sanat\OneDrive\Doc
Enter N: 5
Head Recursion Sum = 15
Tail Recursion Sum = 15

Process exited after 2.433 seconds with return value 0
Press any key to continue . . .