## Aim:

Consider a linked list consisting of name of a person and gender as a node. Arrange the linked list using 'Ladies first' principle. You may create new linked lists if necessary.

Note: Add node at the beginning.

## **Source Code:**

## rearrangeList.c

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
struct Node
    int data;
     char name[20];
      char gender;
       struct Node *next;
};
void segregateEvenOdd(struct Node **head_ref)
    struct Node *end = *head_ref;
     struct Node *prev = NULL;
      struct Node *curr = *head_ref;
       while (end->next != NULL)
        end = end->next;
         struct Node *new_end = end;
          while (curr->data %2 != 0 && curr != end)
           {
             new_end->next = curr;
              curr = curr->next;
               new_end->next->next = NULL;
                new_end = new_end->next;
           }
            if (curr->data\%2 == 0)
             {
                *head_ref = curr;
                 while (curr != end)
                      if ((curr->data)\%2 == 0)
                         prev = curr;
                          curr = curr->next;
                       }
                        else
```

```
prev->next = curr->next;
                              curr->next = NULL;
                               new_end->next = curr;
                                new_end = curr;
                                 curr = prev->next;
                         }
                  }
             }
              else
              prev = curr;
               if (new end!=end && (end->data)%2 != 0)
                   prev->next = end->next;
                    end->next = NULL;
                     new_end->next = end;
                 return;
}
void push(struct Node** head_ref, char new_name[20], char new_gender)
{
    struct Node* new_node = (struct Node*) malloc(sizeof(struct Node));
     strcpy(new_node->name, new_name);
      new_node->gender = new_gender;
       if (new_gender == 'F')
       new_node->data = 0;
        else if (new_gender == 'M')
        new_node->data = 1;
         new_node->next = (*head_ref);
          (*head_ref) = new_node;
}
void printList(struct Node *node)
{
    while (node!=NULL)
       printf("%s (%c)", node->name, node->gender);
        node = node->next;
         if (node!=NULL)
         printf(" --> ");
     }
}
int main()
    struct Node* head = NULL;
     char name[20];
      char gender;
       int noOfInputs, i;
        int option;
         printf("Insert Data\n");
          do
```

```
printf("Enter Name: ");
              scanf(" %s", name);
               printf("Enter Gender: ");
                scanf(" %c", &gender);
                 push(&head, name, gender);
                  printf("1 : Insert into Linked List\n");
                   printf("0 : Exit\n");
                    printf("Enter your option: ");
                     scanf(" %d", &option);
           } while(option == 1);
            printf("Original Linked list \n");
             printList(head);
              segregateEvenOdd(&head);
               printf("\nModified Linked list \n");
                printList(head);
                 printf("\n");
                  return 0;
}
```

## Execution Results - All test cases have succeeded!

Test Case - 1

```
User Output
Insert Data Ganga
Enter Name: Ganga
Enter Gender: F
1 : Insert into Linked List 1
0 : Exit 1
Enter your option: 1
Enter Name: Yamuna
Enter Gender: F
1 : Insert into Linked List 1
0 : Exit 1
Enter your option: 1
Enter Name: Raj
Enter Gender: M
1 : Insert into Linked List 1
0 : Exit 1
Enter your option: 1
Enter Name: Veer
Enter Gender: M
1 : Insert into Linked List 1
0 : Exit 1
Enter your option: 1
Enter Name: Narmada
Enter Gender: F
1 : Insert into Linked List 1
0 : Exit 1
Enter your option:
Enter Name: Amar
Enter Gender: M
```

```
1 : Insert into Linked List 0
0 : Exit 0
Enter your option: 0
Original Linked list
Amar (M) --> Narmada (F) --> Veer (M) --> Raj (M) --> Yamuna (F) --> Ganga (F)
Modified Linked list
Narmada (F) --> Yamuna (F) --> Ganga (F) --> Amar (M) --> Veer (M) --> Raj (M)
```

```
Test Case - 2
User Output
Insert Data Ganga
Enter Name: Ganga
Enter Gender: F
1 : Insert into Linked List 1
0 : Exit 1
Enter your option: 1
Enter Name: Yamuna
Enter Gender: F
1 : Insert into Linked List 1
0 : Exit 1
Enter your option: 1
Enter Name: Narmada
Enter Gender: F
1 : Insert into Linked List 0
0 : Exit 0
Enter your option: 0
Original Linked list
Narmada (F) --> Yamuna (F) --> Ganga (F)
Modified Linked list
Narmada (F) --> Yamuna (F) --> Ganga (F)
```

Test dase o
User Output
Insert Data Raj
Enter Name: Raj
Enter Gender: M
1 : Insert into Linked List 1
0 : Exit 1
Enter your option: 1
Enter Name: Veer
Enter Gender: M
1 : Insert into Linked List 1
0 : Exit 1
Enter your option: 1
Enter Name: Amar
Enter Gender: M
1 : Insert into Linked List 0
0 : Exit 0
Enter your option: 0
Original Linked list
Amar (M)> Veer (M)> Raj (M)
Modified Linked list
Amar (M)> Veer (M)> Raj (M)

Test Case - 3