S.No: 36	Exp. Name: ***Linked list Female gender first***	Date:2023-07-01

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;
         }
      }
```


ID: 224G1A0530

Srinivasa Ramanujan Institute of Technology

```
   }
   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: 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) --> 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 Case - 3
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)