S.No: 36	Exp. Name: ***Linked list Female gender first***	Date:2023-06-25

ID: 224G1A0516

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: 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)