**CODE OF THE PROGRAM & OUTPUT:**

#include<stdio.h>

#include<stdlib.h>

#include<malloc.h>

#include<string.h>

#define MAX 10

typedef struct contact

{

char name[20],number[11],address[50], group[20];

int fav,freq;

struct contact \*next;

}contact;

typedef struct ll

{

contact \*start;

}ll;

//R E C E N T S

typedef struct recent

{

contact \*a;

struct recent \*next;

}recent;

typedef struct stack

{

recent \*top;

}Log;

void push(Log \*s,contact \* c)

{

recent \*new;

new=(recent\*)malloc(sizeof(recent));

new->a=c;

new->next=s->top;//works even when top=null

s->top=new;

}

void pop(Log \*s)

{

recent \*p;

if(s->top==NULL)

{

printf("Call Log Empty\n");

}

else

{

p=s->top;

s->top=s->top->next;

printf("Deleting Recent Call to %s",p->a->name);

p->a->freq--;

free (p);

}

}

void displayLog(Log \* s)

{

recent \*p;

int i=1;

p=s->top;

if(p==NULL)

printf("Call Log Empty!\n");

else

{

printf("Name | Phone Number | No. of Times\n");

printf("----------------------------------------\n");

while(p!=NULL)

{

printf("%s \t\t%s\t\t\t %d\n",p->a->name,p->a->number,i);

p=p->next;

}

}

}

//P H O N E B O O K

void displayAll(ll \*l1)

{

contact \*ptr;

int i=1;

ptr=l1->start;

printf(" Sr.No.\t\tName\t\tPhone Number\tGroup\t\tCall Frequency\t\tAddress\n");

printf(" ======\t\t====\t\t============\t=====\t\t==============\t\t=======\n");

while(ptr!=NULL)

{

printf(" %d\t\t\t%s\t\t%s\t\t\t%s\t%d\t\t\t\t\t%s \n",i,ptr->name, ptr->number, ptr->group, ptr->freq,ptr->address);

ptr=ptr->next;

i++;

}

}

void displayFav( ll \*l1)

{

contact \*ptr;

int j = 1,i;

ptr = l1->start;

printf("------Display All Favourites Records-----\n");

printf("Sr No.\t\t\t\tName\t\t\tTelephone No.\t\t\tAddress\n");

printf("======\t\t\t\t====\t\t\t=============\t\t\t=======\n");

while(ptr!= NULL )

{

if(ptr->fav == 1)

{

printf("%d\t\t\t\t", j);

printf("%s\t\t\t", ptr->name);

printf("%s\t\t\t", ptr->number);

printf("%s\t",ptr->address);

printf("\n");

j++;

}

ptr = ptr->next;

}

}

void displayGroup(ll \*l1,int ch)

{

contact \*ptr;

int i, j = 1;

char grp1[] = "Family";

char grp2[] = "Friend";

char grp3[] = "Colleague";

ptr = l1->start;

switch(ch)

{

case 1:

printf("---------Display Family Group----------\n");

printf("Sr No.\t\t\tName\t\t\tTelephone No.\t\t\tAddress\n");

printf("======\t\t\t====\t\t\t=============\t\t\t=======\n");

while(ptr != NULL)

{

if(strcmp(ptr->group,grp1) == 0)

{

printf("%d\t\t\t\t", j);

printf("%s\t\t\t", ptr->name);

printf("%s\t\t\t", ptr->number);

printf("%s\t",ptr->address);

printf("\n");

j++;

}

ptr = ptr->next;

}

break;

case 2:

printf("-----------Display Friend Group----------\n");

printf("Sr No.\t\t\tName\t\t\tTelephone No.\t\t\tAddress\n");

printf("======\t\t\t====\t\t\t=============\t\t\t=======\n");

while(ptr != NULL)

{

if(strcmp(ptr->group,grp2) == 0)

{

printf("%d\t\t\t\t", j);

printf("%s\t\t\t", ptr->name);

printf("%s\t\t\t", ptr->number);

printf("%s\t",ptr->address);

printf("\n");

j++;

}

ptr = ptr->next;

}

break;

case 3:

printf("---------Display Colleague Group--------\n");

printf("Sr No.\t\t\tName\t\t\tTelephone No.\t\t\tAddress\n");

printf("======\t\t\t====\t\t\t=============\t\t\t=======\n");

while(ptr != NULL)

{

if(strcmp(ptr->group,grp3) == 0)

{

printf("%d\t\t\t\t", j);

printf("%s\t\t\t", ptr->name);

printf("%s\t\t\t", ptr->number);

printf("%s\t",ptr->address);

printf("\n");

j++;

}

ptr = ptr->next;

}

break;

}

}

contact \*dispaly(ll \*l1)

{

int ch;

printf("Select\n");

printf("1. To display Family Group\n");

printf("2. To display Colleague Group\n");

printf("3. To display Friend Group\n");

printf("4. To display All Groups\n");

scanf("%d", &ch);

switch (ch)

{

case 1:

{

displayGroup(l1, ch);

break;

}

case 2:

{

displayGroup(l1, ch);

break;

}

case 3:

{

displayGroup(l1, ch);

break;

}

case 4:

{

displayGroup(l1, 1);

displayGroup(l1, 2);

displayGroup(l1, 3);

break;

}

default:

{

printf("Please select a valid number\n");

break;

}

}

return l1->start;

}

contact \*insert(ll \*l1)

{

contact \*new,\*ptr;

char grp1[] = "Family";

char grp2[] = "Friend";

char grp3[] = "Colleague";

char grp4[]="None";

int num=1,n;

do

{

new = (contact\*)malloc(sizeof(contact));

printf("Enter the name:");

flushall();

gets(new->name);

printf("Enter the Phone Number:");

scanf("%s",new->number);

printf("Enter the Address: \n");

flushall();

gets(new->address);

printf("Add as favorite: 1. Yes \t 2. No \nEnter Choice:");

scanf("%d",&new->fav);

printf("Enter the Group in which you want to add this contact: \n 1. Family \t 2. Friend \t 3. Colleague \t 4.None\n");

scanf("%d",&n);

if(n == 1)

strcpy(new->group,grp1);

else if(n == 2)

strcpy(new->group,grp2);

else if(n==3)

strcpy(new->group,grp3);

else

strcpy(new->group,grp4);

new->freq=0;

new->next = NULL;

if(l1->start == NULL)

{

l1->start = new;

}

else

{

ptr = l1->start;

while(ptr->next!=NULL)

{

ptr = ptr->next;

}

ptr->next = new;

new->next = NULL;

}

printf("Do you want to continue: 1. Yes \t 2. No \n");

scanf("%d", &num);

printf("Add New Contact:\n");

}while(num!=2);

return l1->start;

}

contact \*delete(ll \*l1)

{

contact \*ptr, \*preptr;

char val[40];

int flag=0;

printf("Enter the contact to be deleted \n");

scanf("%s", &val);

ptr = l1->start;

preptr = ptr;

while( ptr != NULL && (strcmp(ptr->name,val) != 0))

{

preptr = ptr;

ptr = ptr->next;

}

if(strcmp(ptr->name,val) == 0)

{

flag = 1;

if(ptr == l1->start)

{

l1->start = l1->start->next;

}

else

{

preptr->next = ptr->next;

}

}

if(flag == 0)

printf("Contact not found \n");

else

printf("%s is deleted from contact list \n", ptr->name);

free(ptr);

return l1->start;

}

contact \*sortName(contact \*start, contact \*ptr)

{

contact \*current;

/\* Special case for the head end \*/

if (start == NULL || strcmp(start->name, ptr->name) > 0)

{

ptr->next = start;

start = ptr;

}

else

{

/\* Locate the node before the point of insertion \*/

current = start;

while (current->next!=NULL && strcmp(current->name, ptr->name) < 0)

{

current = current->next;

}

ptr->next = current->next;

current->next = ptr;

}

return start;

}

contact \* sort(ll \*l1)

{

contact \*next,\*sorted=NULL;

contact \*current = l1->start;

while (current != NULL)

{

next = current->next;// Stores next for next iteration

sorted=sortName(sorted, current); // insert current in sorted linked list

current = next; // Updates current

}

l1->start=sorted;

return l1->start;

}

void edit(ll \*l1)

{

contact \*ptr;

char val[20],grp1[] = "Family",grp2[] = "Friend",grp3[] = "Colleague",grp4[]="None";

int flag = 0,n,m;

printf("Enter the Name of the contact to be edited:");

flushall();

gets(val);

ptr = l1->start;

while(ptr != NULL)

{

if(strcmp(ptr->name,val)==0)

{

flag = 1;

break;

}

else

{

ptr = ptr->next;

}

}

if(flag == 0)

printf("Contact not Found \n");

else

{

printf("What would you like to edit?\n1. Name \n2. Phone Number \n3. Address \n4. Favourites\n 5. Group\n 0. Exit \n");

scanf("%d",&n);

do

{

switch(n)

{

case 1:

printf("Enter Name:");

flushall();

gets(ptr->name);

break;

case 2:

printf("Enter the Phone Number:");

scanf("%s",ptr->number);

break;

case 3:

printf("Enter Address: \n");

flushall();

gets(ptr->address);

break;

case 4:

printf("Add as favorite: 1. Yes \t 2. No \nEnter Choice:");

scanf("%d",&ptr->fav);

break;

case 5:

printf("Enter the Group in which you want to add this contact: \n 1. Family \t 2. Friend \t 3. Colleague \t 4.None\n");

scanf("%d",&m);

if(m == 1)

strcpy(ptr->group,grp1);

else if(m == 2)

strcpy(ptr->group,grp2);

else if(m==3)

strcpy(ptr->group,grp3);

else

strcpy(ptr->group,grp4);

break;

}

printf("What more would you like to edit?\n1. Name \n2. Phone Number \n3. Address \n4. Favourites\n 5. Group\n 0. Exit \n");

scanf("%d",&n);

}while(n!=0);

printf("Edited Contact:\n");

printf(" Name | Phone Number | Group | Call Frequency | Fav | Address\n");

printf(" %s | %s | %s | %d | %d | %s \n",ptr->name, ptr->number, ptr->group, ptr->freq,ptr->fav,ptr->address);

printf("-----------------------\n");

}

}

//C A L L L O G

void callLog(Log \*L1,ll \*l1)

{

char val[20];

int flag = 0;

contact \*ptr;

displayAll(l1);

printf("Search:\n");

flushall();

gets(val);

ptr = l1->start;

while(ptr != NULL)

{

if(strcmp(ptr->name,val) == 0)

{

push(L1,ptr);

flag = 1;

ptr->freq++;

break;

}

else

{

ptr = ptr->next;

}

}

if(flag == 0)

printf("Contact Not Found\n");

else

printf("You've Called %s\n",ptr->name);

}

int main()

{

int x, y, ch1, n;

ll l1;

Log L1;

L1.top = NULL;

l1.start = NULL;

do

{

printf("\n\*\*\*\*\*\*\*\*\*\*WELCOME TO PHONEBOOK\*\*\*\*\*\*\*\*\*\*\*\*\*");

printf("\n 1. Add contact \n 2. Delete contact \n 3. Display Entire Contact list \n 4. Edit Contact \n 5. Call \n 6. Display Call Log \n 7. Delete Recently Called\n 8. Display Favourites \n 9. View Groups\n 0. Exit \nEnter choice of operation:");

scanf("%d", &n);

switch (n)

{

case 1 :

printf("Add New Contact: \n");

l1.start = insert(&l1);

l1.start= sort(&l1);

displayAll(&l1);

break;

case 2 :

l1.start = delete(&l1);

displayAll(&l1);

break;

case 3 :

displayAll(&l1);

break;

case 4 :

edit(&l1);

l1.start=sort(&l1);

break;

case 5 :

callLog(&L1,&l1);

break;

case 6 :

displayLog(&L1);

break;

case 7:

pop(&L1);

break;

case 8 :

displayFav(&l1);

break;

case 9 :

l1.start=display(&l1);

break;

}

}while(n!=0);

return 0;

}

**OUTPUT:**

/\*

\*\*\*\*\*\*\*\*\*\*WELCOME TO PHONEBOOK\*\*\*\*\*\*\*\*\*\*\*\*\*

1. Add contact

2. Delete contact

3. Display Entire Contact list

4. Edit Contact

5. Call

6. Display Call Log

7. Delete Recently Called

8. Display Favourites

9. View Groups

0. Exit

Enter choice of operation:1

Add New Contact:

Enter the name:Darlene

Enter the Phone Number:1234567

Enter the Address:

Japan

Add as favorite: 1. Yes      2. No

Enter Choice:1

Enter the Group in which you want to add this contact:

1. Family   2. Friend   3. Colleague    4.None

1

Do you want to continue: 1. Yes      2. No

1

Add New Contact:

Enter the name:Beverly

Enter the Phone Number:123678

Enter the Address:

Germany

Add as favorite: 1. Yes      2. No

Enter Choice:1

Enter the Group in which you want to add this contact:

1. Family   2. Friend   3. Colleague    4.None

1

Do you want to continue: 1. Yes      2. No

1

Add New Contact:

Enter the name:Sherwin

Enter the Phone Number:123333

Enter the Address:

Spain

Add as favorite: 1. Yes      2. No

Enter Choice:2

Enter the Group in which you want to add this contact:

1. Family   2. Friend   3. Colleague    4.None

2

Do you want to continue: 1. Yes      2. No

1

Add New Contact:

Enter the name:Kathy

Enter the Phone Number:555555

Enter the Address:

NewYork

Add as favorite: 1. Yes      2. No

Enter Choice:2

Enter the Group in which you want to add this contact:

1. Family   2. Friend   3. Colleague    4.None

4

Do you want to continue: 1. Yes      2. No

1

Add New Contact:

Enter the name:Johnny

Enter the Phone Number:22222

Enter the Address:

Florida

Add as favorite: 1. Yes      2. No

Enter Choice:2

Enter the Group in which you want to add this contact:

1. Family   2. Friend   3. Colleague    4.None

3

Do you want to continue: 1. Yes      2. No

1

Add New Contact:

Enter the name:Amelia

Enter the Phone Number:666666

Enter the Address:

Holland

Add as favorite: 1. Yes      2. No

Enter Choice:2

Enter the Group in which you want to add this contact:

1. Family   2. Friend   3. Colleague    4.None

3

Do you want to continue: 1. Yes      2. No

1

Add New Contact:

Enter the name:Lionel

Enter the Phone Number:79674

Enter the Address:

Goa

Add as favorite: 1. Yes      2. No

Enter Choice:1

Enter the Group in which you want to add this contact:

1. Family   2. Friend   3. Colleague    4.None

1

Do you want to continue: 1. Yes      2. No

2

Sr.No.      Name        Phone Number    Group       Call Frequency      Address

======      ====        ============    =====    ==============      =======

1.         Amelia      666666          Colleague   0                   Holland

2.         Beverly     123678          Family      0                   Germany

3.         Darlene     1234567         Family      0                   Japan

4.         Sherwin     123333          Friend      0                   Spain

5.         Lionel      79674           Family      0                   Goa

6.         Johnny      22222           Colleague   0                   Florida

7.         Kathy       555555          None        0                   NewYork

\*\*\*\*\*\*\*\*\*\*WELCOME TO PHONEBOOK\*\*\*\*\*\*\*\*\*\*\*\*\*

1. Add contact

2. Delete contact

3. Display Entire Contact list

4. Edit Contact

5. Call

6. Display Call Log

7. Delete Recently Called

8. Display Favourites

9. View Groups

0. Exit

Enter choice of operation:9

Select

1. To display Family Group

2. To display Colleague Group

3. To display Friend Group

4. To display All Groups

4

---------Display Family Group----------

Sr No.          Name            Telephone No.   Address

======          ====            =============   =======

1               Beverly         123678          Germany

2               Darlene         1234567         Japan

3               Lionel          79674           Goa

-----------Display Friend Group----------

Sr No.          Name            Telephone No.   Address

======          ====            ============    =======

1               Sherwin         123333          Spain

---------Display Colleague Group--------

Sr No.          Name            Telephone No.   Address

======          ====            =============   =======

1               Amelia          666666          Holland

2               Johnny          22222           Florida

\*\*\*\*\*\*\*\*\*\*WELCOME TO PHONEBOOK\*\*\*\*\*\*\*\*\*\*\*\*\*

1. Add contact

2. Delete contact

3. Display Entire Contact list

4. Edit Contact

5. Call

6. Display Call Log

7. Delete Recently Called

8. Display Favourites

9. View Groups

0. Exit

Enter choice of operation:8

------Display All Favourites Records-----

Sr No.          Name            Telephone No.   Address

======          ====            =============   =======

1               Beverly         123678          Germany

2               Darlene         1234567         Japan

3               Lionel          79674           Goa

\*\*\*\*\*\*\*\*\*\*WELCOME TO PHONEBOOK\*\*\*\*\*\*\*\*\*\*\*\*\*

1. Add contact

2. Delete contact

3. Display Entire Contact list

4. Edit Contact

5. Call

6. Display Call Log

7. Delete Recently Called

8. Display Favourites

9. View Groups

0. Exit

Enter choice of operation:5

Sr.No.     Name        Phone Number    Group       Call Frequency      Address

======     ====        ============    =====    ==============      =======

1.         Amelia 666666          Colleague   0      Holland

2.         Beverly     123678          Family      0                   Germany

3.         Darlene     1234567         Family      0                   Japan

4.         Sherwin     123333          Friend      0                   Spain

5.         Lionel      79674           Family      0                   Goa

6.         Johnny      22222           Colleague   0                   Florida

7.         Kathy       555555          None        0                   NewYork

Search:

Darlene

You've Called Darlene

\*\*\*\*\*\*\*\*\*\*WELCOME TO PHONEBOOK\*\*\*\*\*\*\*\*\*\*\*\*\*

1. Add contact

2. Delete contact

3. Display Entire Contact list

4. Edit Contact

5. Call

6. Display Call Log

7. Delete Recently Called

8. Display Favourites

9. View Groups

0. Exit

Enter choice of operation:5

Sr.No.     Name        Phone Number    Group       Call Frequency      Address

======     ======      ===========     =====    ==============      =======

1.         Amelia 666666          Colleague   0      Holland

2.         Beverly     123678          Family      0                   Germany

3.         Darlene     1234567         Family      1                   Japan

4.         Sherwin     123333          Friend      0                   Spain

5.         Lionel      79674           Family      0                   Goa

6.         Johnny      22222           Colleague   0                   Florida

7.         Kathy       555555          None        0                   NewYork

Search:

Lionel

You've Called Lionel

\*\*\*\*\*\*\*\*\*\*WELCOME TO PHONEBOOK\*\*\*\*\*\*\*\*\*\*\*\*\*

1. Add contact

2. Delete contact

3. Display Entire Contact list

4. Edit Contact

5. Call

6. Display Call Log

7. Delete Recently Called

8. Display Favourites

9. View Groups

0. Exit

Enter choice of operation:5

Sr.No.     Name        Phone Number    Group       Call Frequency      Address

======     ======      ===========     =====    ==============      =======

1.         Amelia 666666          Colleague   0      Holland

2.         Beverly     123678          Family      0                   Germany

3.         Darlene     1234567         Family      1                   Japan

4.         Sherwin     123333          Friend      0                   Spain

5.         Lionel      79674           Family      1                   Goa

6.         Johnny      22222           Colleague   0                   Florida

7.         Kathy       555555          None        0                   NewYork

Search:

Sherwin

You've Called Sherwin

\*\*\*\*\*\*\*\*\*\*WELCOME TO PHONEBOOK\*\*\*\*\*\*\*\*\*\*\*\*\*

1. Add contact

2. Delete contact

3. Display Entire Contact list

4. Edit Contact

5. Call

6. Display Call Log

7. Delete Recently Called

8. Display Favourites

9. View Groups

0. Exit

Enter choice of operation:5

Sr.No.     Name        Phone Number    Group       Call Frequency      Address

======     ======      ===========     =====    ==============      =======

1.         Amelia 666666          Colleague   0      Holland

2.         Beverly     123678          Family      0                   Germany

3.         Darlene     1234567         Family      1                   Japan

4.         Sherwin     123333          Friend      1                   Spain

5.         Lionel      79674           Family      1                   Goa

6.         Johnny      22222           Colleague   0                   Florida

7.         Kathy       555555          None        0                   NewYork

Search:

Sherwin

You've Called Sherwin

\*\*\*\*\*\*\*\*\*\*WELCOME TO PHONEBOOK\*\*\*\*\*\*\*\*\*\*\*\*\*

1. Add contact

2. Delete contact

3. Display Entire Contact list

4. Edit Contact

5. Call

6. Display Call Log

7. Delete Recently Called

8. Display Favourites

9. View Groups

0. Exit

Enter choice of operation:6

Name | Phone Number | No. of Times

----------------------------------------

Sherwin     123333          1

Sherwin     123333          1

Lionel      79674           1

Darlene     1234567         1

\*\*\*\*\*\*\*\*\*\*WELCOME TO PHONEBOOK\*\*\*\*\*\*\*\*\*\*\*\*\*

1. Add contact

2. Delete contact

3. Display Entire Contact list

4. Edit Contact

5. Call

6. Display Call Log

7. Delete Recently Called

8. Display Favourites

9. View Groups

0. Exit

Enter choice of operation:3

Sr.No.      Name        Phone Number    Group       Call Frequency      Address

======     ======      ===========     =====    ==============      =======

1.         Amelia 666666          Colleague   0      Holland

2.         Beverly     123678          Family      0                   Germany

3.         Darlene     1234567         Family      1                   Japan

4.         Sherwin     123333          Friend      2                   Spain

5.         Lionel      79674           Family      1                   Goa

6.         Johnny      22222           Colleague   0                   Florida

7.         Kathy       555555          None        0                   NewYork

\*\*\*\*\*\*\*\*\*\*WELCOME TO PHONEBOOK\*\*\*\*\*\*\*\*\*\*\*\*\*

1. Add contact

2. Delete contact

3. Display Entire Contact list

4. Edit Contact

5. Call

6. Display Call Log

7. Delete Recently Called

8. Display Favourites

9. View Groups

0. Exit

Enter choice of operation:7

Deleted Recent Call to Sherwin

Enter choice of operation:

1. Add contact

2. Delete contact

3. Display Entire Contact list

4. Edit Contact

5. Call

6. Display Call Log

7. Delete Recently Called

8. Display Favourites

9. View Groups

0. Exit

6

Name | Phone Number | No. of Times

----------------------------------------

Sherwin     123333          1

Lionel      79674           1

Darlene     1234567         1

\*\*\*\*\*\*\*\*\*\*WELCOME TO PHONEBOOK\*\*\*\*\*\*\*\*\*\*\*\*\*

1. Add contact

2. Delete contact

3. Display Entire Contact list

4. Edit Contact

5. Call

6. Display Call Log

7. Delete Recently Called

8. Display Favourites

9. View Groups

0. Exit

Enter choice of operation:4

Enter the Name of the contact to be edited:Amelia

What would you like to edit?

1. Name

2. Phone Number

3. Address

4. Favourites

5. Group

0. Exit

1

Enter Name:Abigale

What more would you like to edit?

1. Name

2. Phone Number

3. Address

4. Favourites

5. Group

0. Exit

5

Enter the Group in which you want to add this contact:

1. Family   2. Friend   3. Colleague    4.None

2

What more would you like to edit?

1. Name

2. Phone Number

3. Address

4. Favourites

5. Group

0. Exit

0

Edited Contact:

Name | Phone Number | Group | Call Frequency | Fav | Address

Abigale | 666666 | Friend | 0 | 2 | Holland

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\*\*\*\*\*\*\*\*\*\*WELCOME TO PHONEBOOK\*\*\*\*\*\*\*\*\*\*\*\*\*

1. Add contact

2. Delete contact

3. Display Entire Contact list

4. Edit Contact

5. Call

6. Display Call Log

7. Delete Recently Called

8. Display Favourites

9. View Groups

0. Exit

Enter choice of operation:2

Enter the contact to be deleted

Lionel

Lionel is deleted from contact list

Sr.No.     Name        Phone Number    Group       Call Frequency      Address

======     ======      ===========     =====    ==============      =======

1.         Abigale 666666          Friend      0      Holland

2.         Beverly     123678          Family      0                   Germany

3.         Darlene     1234567         Family      1                   Japan

4.         Sherwin     123333          Friend      1                   Spain

5.         Johnny      22222           Colleague   0                   Florida

6.         Kathy       555555          None        0                   NewYork

\*\*\*\*\*\*\*\*\*\*WELCOME TO PHONEBOOK\*\*\*\*\*\*\*\*\*\*\*\*\*

1. Add contact

2. Delete contact

3. Display Entire Contact list

4. Edit Contact

5. Call

6. Display Call Log

7. Delete Recently Called

8. Display Favourites

9. View Groups

0. Exit

Enter choice of operation:0

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