

VIBHA HUGAR 1BM21CS255

ADA LAB

HASHING: LINEAR PROBING, QUADRATIC PROBING AND DOUBLE HASHING

CODE

```
#include <stdio.h>

#include<stdlib.h>

int i,j,tsize,n,j,arr[20],hasht[20],ch,key,key1,t;

int hashh(int a){

    int i;

    i=a%20;

    return(i);

}

int probel(int a){

    int i;

    i=(a+1)%20;

    return(i);

}

int probeq(int a,int j){

    int i;

    i=(a+(j*j))%20;

    return(i);

}

int probed(int key,int val,int j){

    int i;

    i=key+j*((13-(val%13))%20);

    return(i);

}
```

```
}
```

```
int main()
```

```
{
```

```
    printf("Enter no of table ele \n");
```

```
    scanf("%d",&n);
```

```
    printf("Enter the ele \n");
```

```
    for(i=0;i<n;i++) {
```

```
        printf("Enter the %d th ele \n",i);
```

```
        scanf("%d",&arr[i]);
```

```
    }
```

```
    for(i=0;i<20;i++){
```

```
        hasht[i]=-1;
```

```
    }
```

```
    printf("\n 1. Linear Probing \n 2. Quad Probing \n 3. Double hashing \n 4. Exit \n");
```

```
    printf("Enter your choice \n");
```

```
    scanf("%d",&ch);
```

```
    switch(ch) {
```

```
        case 1:
```

```
        for(i=0;i<n;i++){
```

```
            key=hashh(arr[i]);
```

```
            while(hasht[key]!=-1){
```

```
                key=probel(key);
```

```
            }
```

```
            hasht[key]=arr[i];
```

```
            printf("\n Ele %d inserted at %d \t",arr[i],key);
```

```
        }
```

```
        break;
```

case 2:

```
for(i=0;i<n;i++){  
    key=hashh(arr[i]);  
    j=1;  
    key1=key;  
    while(hasht[key1]!=-1){  
        key1=probeq(key,j);  
        j++;  
    }  
    hasht[key1]=arr[i];  
    printf("\n Ele %d inserted at %d \t",arr[i],key1);  
}  
break;
```

case 3:

```
for(t=0;t<n;t++){  
    key=hashh(arr[t]);  
    j=1;  
    key1=key;  
    while(hasht[key1]!=-1){  
        key1=probed(key,arr[t],j);  
        j++;  
    }  
    hasht[key1]=arr[t];  
    printf("\n Ele %d inserted at %d %d %d \t",arr[t],key1,t,n);  
}  
break;
```

```

        case 4:

            exit(0);

            break;

        default:

            printf("Wrong choice \n");

            break;

    }

    return 0;
}

```

OUTPUT

Linear probing

```

"C:\Users\Admin\Desktop\cs255\4th sem ada lab\hashing.exe"
Enter the 0 th ele
23
Enter the 1 th ele
4
Enter the 2 th ele
56
Enter the 3 th ele
18
Enter the 4 th ele
24
Enter the 5 th ele
5
Enter the 6 th ele
72
1. Linear Probing
2. Quad Probing
3. Double hashing
4. Exit
Enter your choice1

Ele 23 inserted at 3
Ele 4 inserted at 4
Ele 56 inserted at 16
Ele 18 inserted at 18
Ele 24 inserted at 5
Ele 5 inserted at 6
Ele 72 inserted at 12
Process returned 0 (0x0)   execution time : 26.188 s
Press any key to continue.

```

Quadratic probing

```
"C:\Users\Admin\Desktop\cs255\4th sem ada lab\hashing.exe"
Enter the 0 th ele
23
Enter the 1 th ele
4
Enter the 2 th ele
56
Enter the 3 th ele
18
Enter the 4 th ele
24
Enter the 5 th ele
5
Enter the 6 th ele
72
1. Linear Probing
2. Quad Probing
3. Double hashing
4. Exit
Enter your choice2

Ele 23 inserted at 3
Ele 4 inserted at 4
Ele 56 inserted at 16
Ele 18 inserted at 18
Ele 24 inserted at 5
Ele 5 inserted at 6
Ele 72 inserted at 12
Process returned 0 (0x0)    execution time : 87.224 s
Press any key to continue.
```

Double hashing

```
"C:\Users\Admin\Desktop\cs255\4th sem ada lab\hashing.exe"
Enter no of table ele
7
Enter the ele
Enter the 0 th ele
23
Enter the 1 th ele
4
Enter the 2 th ele
56
Enter the 3 th ele
18
Enter the 4 th ele
24
Enter the 5 th ele
5
Enter the 6 th ele
72
1. Linear Probing
2. Quad Probing
3. Double hashing
4. Exit
Enter your choice3

Ele 23 inserted at 3 0 7
Ele 4 inserted at 4 1 7
Ele 56 inserted at 16 2 7
Ele 18 inserted at 18 3 7
Ele 24 inserted at 6 4 7
Ele 5 inserted at 5 5 7
Ele 72 inserted at 12 6 7
Process returned 0 (0x0)    execution time : 26.688 s
Press any key to continue.
```

EXIT

"C:\Users\Admin\Desktop\cs255\4th sem ada lab\hashing.exe"

```
Enter no of table ele
7
Enter the ele
Enter the 0 th ele
23
Enter the 1 th ele
4
Enter the 2 th ele
56
Enter the 3 th ele
18
Enter the 4 th ele
24
Enter the 5 th ele
5
Enter the 6 th ele
72
1. Linear Probing
2. Quad Probing
3. Double hashing
4. Exit
Enter your choice4

Process returned 0 (0x0)   execution time : 25.828 s
Press any key to continue.
```