Write the simulation program to implement demand paging and show the page scheduling and total number of page faults for the following given page reference string. Give input n as the number of memory frames.
Reference String : 12,15,12,18,6,8,11,12,19,12,6,8,12,15,19,8
i. Implement OPT

```
#include<stdio.h>
int main()
{
   int no_of_frames, no_of_pages, frames[10], pages[30], temp[10], flag1, flag2, flag3, i, j, k, pos, max, faults = 0;
   printf("Enter number of frames: ");
   scanf("%d", &no_of_frames);

   printf("Enter number of pages: ");
   scanf("%d", &no_of_pages);

   printf("Enter page reference string: ");

   for(i = 0; i < no_of_pages; ++i){
      scanf("%d", &pages[i]);
   }

   for(i = 0; i < no_of_frames; ++i){
      frames[i] = -1;
   }

   for(i = 0; i < no_of_pages; ++i){
      flag1 = flag2 = 0;

      for(j = 0; j < no_of_frames; ++j){
         if(frames[j] == pages[i]){
               flag1 = flag2 = 1;
               break;
           }
      }

      if(flag1 == 0){
         for(j = 0; j < no_of_frames; ++j){
            if(frames[j] == -1){
               faults++;
               frames[j] = pages[i];
               flag2 = 1;
               break;
            }
         }
      }

      if(flag2 == 0){
       flag3 =0;
```

```
            for(j = 0; j < no_of_frames; ++j){
             temp[j] = -1;

             for(k = i + 1; k < no_of_pages; ++k){
             if(frames[j] == pages[k]){
             temp[j] = k;
             break;
             }
             }
            }

            for(j = 0; j < no_of_frames; ++j){
             if(temp[j] == -1){
             pos = j;
             flag3 = 1;
             break;
             }
            }

            if(flag3 ==0){
             max = temp[0];
             pos = 0;

             for(j = 1; j < no_of_frames; ++j){
             if(temp[j] > max){
             max = temp[j];
             pos = j;
             }
             }
            }
frames[pos] = pages[i];
faults++;
        }

        printf("\n");

        for(j = 0; j < no_of_frames; ++j){
           printf("%d\t", frames[j]);
        }
    }

    printf("\n\nTotal Page Faults = %d", faults);

    return 0;
}
```