University of Asia Pacific

Department of CSE

Course Code: CSE108
Course Title: Competitive Programming

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Section: C

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Submitted To

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1. **Maximum and minimum of an array using minimum number of comparisons**

```
#include <stdio.h>

int main()
{
   int n, i,max,min;
   printf("Enter array size: ");
   scanf("%d", &n);

   int a[n];
   printf("Enter array elements:\n");
   for(i = 0; i < n; i++)
   {
      scanf("%d", &a[i]);
   }
   max=a[0];
   min=a[0];
   for(i=1;i<n;i++)
   {
      if(a[i]>max)
      {
         max=a[i];
      }
      else if (a[i]<min)
      {
         min=a[i];
      }

   }
```

```
   printf("Miin is %d and max is %d", min, max);

   return 0;
}
```

2. Given an array arr[], the task is to reverse the array. Reversing an array means rearranging the elements such that the first element becomes the last, the second element becomes second last and so on.

```
#include <stdio.h>
int main()
{
   int n,i;
   printf("Enter the size of array:", n);
   scanf("%d", &n);

   int a[n];
   int temp[n];
   printf("Enter the elements of array:", a[n]);
   for(i=0;i<n;i++)
   {
      scanf("%d", &a[i]);
   }
   for(i=0;i<n;i++)
   {
      temp[i]=a[n-i-1];
   }
    for(i=0;i<n;i++)
    {
       a[i]=temp[i];
    }
```

```
        printf("The reversed array is:\n");
        for(i=0;i<n;i++)
        {
           printf("%d", a[i]);
        }
        return 0;
      }
```

3. Program to cyclically rotate an array by one

```
#include <stdio.h>
int main()
{
   int n,i, lastelement;
   scanf("%d", &n);
   int a[n];



    for(i=0;i<n;i++)
    {
        scanf("%d", &a[i]);
    }
    if(n>0)
    {
       lastelement=a[i-1];
```

```
    for(i=n-1;i>0;i--)
    {
        a[i]=a[i-1];

     }
     a[0]= lastelement;
    }
     printf("Rotated Array: ");
   for (i = 0; i < n; i++) {
      printf("%d ", a[i]);
   }
   printf("\n");

   return 0;
}
```

4. Array Sorting

```
#include <stdio.h>
int main()
{
   int n,i,j;
```

```
printf("Enter the size of array:", n);
scanf("%d", &n);

int a[n];
int temp;
printf("Enter the elements of array:", a[n]);
for(i=0;i<n;i++)
{
   scanf("%d", &a[i]);
}
for(i=0;i<n-1;i++)
{
   for(j=0;j<n-i-1;j++)
   {
      if(a[j]>a[j+1])
      {
         temp=a[j];
         a[j]=a[j+1];
         a[j+1]=temp;
      }
   }
}
printf("The array sorted in ascending order is:\n");
```

```
   for(i=0;i<n;i++)
   {
      printf(" %d", a[i]);
   }
   return 0;
}
```

5. Find duplicate elements in an array

```
#include<stdio.h>
int main()
{
   int n,i,j;
   scanf("%d", &n);
   int a[n], visited[n];



   for(i=0;i<n;i++)
   {
      scanf("%d", &a[i]);
   }
    int duplicate=0;
   for(i=0;i<n-1;i++)
   {
      if (visited[i] == 1) {
```

```
        continue;
      }
      for(j=i+1;j<n;j++)
      {
        if(a[i]==a[j])
        {
            visited[j] = 1;
          duplicate = 1;


             }
          }
   }
          if (duplicate) {
        printf("%d\n", a[i]);
        duplicate = 0;


      }
     return 0;
}
```

6. Count number of occurrences (or frequency) in a sorted array

```
#include<stdio.h>
int main()
{
```

```
int n,x,i, count=0;
scanf("%d%d", &n,&x);
int a[n];
for(i=0;i<n;i++)
{
   scanf("%d", &a[i]);
}
for(i=0;i<n;i++)
{
   if(x==a[i])
   {
      count++;

   }
}
   if(count > 0) {
   printf("%d occurs %d times\n", x, count);
} else {
   printf("%d does not occur in the array\n", x);
}


return 0;
```

```
}
```

7. Move all negative numbers to beginning and positive to end with constant extra space

```
#include <stdio.h>
int main()
{
   int n,i,j;
   printf("Enter the size of array:", n);
   scanf("%d", &n);

   int a[n];
   int temp;
   printf("Enter the elements of array:", a[n]);
   for(i=0;i<n;i++)
   {
      scanf("%d", &a[i]);
   }
   for(i=0;i<n-1;i++)
   {
      for(j=0;j<n-i-1;j++)
      {
         if(a[j]>0&&a[j+1]<0)
         {
```

```
            temp=a[j];
            a[j]=a[j+1];
            a[j+1]=temp;
         }
      }
   }
   printf("The array with negative numbers first and positive numbers last is:\n");
   for(i=0;i<n;i++)
   {
      printf(" %d", a[i]);
   }
   return 0;
}
```

8. Majority Element

```
#include<stdio.h>
int main()
{
   int n,j,i, count;
   scanf("%d", &n);
   int a[n];
   for(i=0;i<n;i++)
```

```
{
   scanf("%d", &a[i]);
}
 int majorityElement = -1;
 float s= n/2;
for(i=0;i<n;i++)
{
   count=0;
   for(j=0;j<n;j++)
   {
   if(a[i]==a[j])
   {
      count++;

   }
   }
   if(count > s) {
      majorityElement = a[i];
      break;
}
}

   if(majorityElement != -1) {
```

```
        printf("%d\n", majorityElement);
    } else {
        printf("-1\n");
    }


    return 0;
}
```

9. Sort an array in wave form

```
#include <stdio.h>

int main() {
    int n, i;


    printf("Enter array size: ");
    scanf("%d", &n);

    int a[n];


    printf("Enter array elements:\n");
```

```
for(i = 0; i < n; i++) {
   scanf("%d", &a[i]);
}

int swap;



for(i = 0; i < n - 1; i++) {
   if(i % 2 == 0) {

      if(a[i] < a[i + 1]) {
         swap = a[i];
         a[i] = a[i + 1];
         a[i + 1] = swap;
      }
   } else {

      if(a[i] > a[i + 1]) {
         swap = a[i];
         a[i] = a[i + 1];
         a[i + 1] = swap;
      }
   }
```

```
    }



    for(i = 0; i < n; i++) {
        printf("%d ", a[i]);
    }

    return 0;
}
```