Ans1.

```
#include <stdio.h>

int linearSearch(int arr[], int size, int target) {
for (int i = 0; i < size; i++) {
if (arr[i] == target) {
return 1; // Number found
}
}
return 0; // Number not found
}

int main() {
int array[] = {12, 34, 56, 78, 90, 23, 45};
int size = sizeof(array) / sizeof(array[0]);

int numberToFind;
printf("Enter the number to search for: ");
scanf("%d", &numberToFind);

if (linearSearch(array, size, numberToFind)) {
printf("%d is present in the array.\n", numberToFind);
} else {
printf("%d is not present in the array.\n", numberToFind);
}

return 0;
}
```

Ans2.

```
#include <stdio.h>

void findSecondMinMax(int arr[], int size) {
int max1 = arr[0], max2 = arr[0];
int min1 = arr[0], min2 = arr[0];

for (int i = 0; i < size; i++) {
if (arr[i] > max1) {
max2 = max1;
max1 = arr[i];
} else if (arr[i] > max2 && arr[i] < max1) {
max2 = arr[i];
}

if (arr[i] < min1) {
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min2 = min1;
min1 = arr[i];
} else if (arr[i] < min2 && arr[i] > min1) {
min2 = arr[i];
}
}

printf("Second Maximum: %d\n", max2);
printf("Second Minimum: %d\n", min2);
}

int main() {
int size;
printf("Enter the size of the array: ");
scanf("%d", &size);

int arr[size];
printf("Enter the elements of the array:\n");
for (int i = 0; i < size; i++) {
scanf("%d", &arr[i]);
}

findSecondMinMax(arr, size);

return 0;
}

Ans3. #include <stdio.h>

void display(int arr[], int size) {
printf("Array elements: ");
for (int i = 0; i < size; i++) {
printf("%d ", arr[i]);
}
printf("\n");
}

void insert(int arr[], int *size, int position, int value) {
if (position < 0 || position > *size) {
printf("Invalid position for insertion.\n");
return;
}

for (int i = *size; i > position; i--) {
arr[i] = arr[i - 1];
}
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arr[position] = value;
(*size)++;
printf("Element inserted successfully.\n");
}

void delete(int arr[], int *size, int position) {
if (position < 0 || position >= *size) {
printf("Invalid position for deletion.\n");
return;
}

for (int i = position; i < *size - 1; i++) {
arr[i] = arr[i + 1];
}

(*size)--;
printf("Element deleted successfully.\n");
}

int main() {
int size, choice;

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

int arr[size];

printf("Enter the elements of the array:\n");
for (int i = 0; i < size; i++) {
scanf("%d", &arr[i]);
}

do {
printf("\nMenu:\n");
printf("1. Insert\n");
printf("2. Delete\n");
printf("3. Display\n");
printf("4. Exit\n");
printf("Enter your choice: ");
scanf("%d", &choice);

switch (choice) {
case 1:
{
int position, value;
printf("Enter the position and value for insertion: ");
scanf("%d %d", &position, &value);
insert(arr, &size, position, value);
break;
}
case 2:
{
int position;
printf("Enter the position for deletion: ");
scanf("%d", &position);
delete(arr, &size, position);
break;
}
case 3:
display(arr, size);
break;
case 4:
printf("Exiting the program.\n");
break;
default:
printf("Invalid choice.\n");
}

} while (choice != 4);

return 0;
}
```

Ans 4.

```
#include <stdio.h>

void performAddition(int arr1[], int arr2[], int size) {
int result[size];

for (int i = 0; i < size; i++) {
result[i] = arr1[i] + arr2[i];
}

printf("Result of addition:\n");
for (int i = 0; i < size; i++) {
printf("%d ", result[i]);
}
printf("\n");
}

void performSubtraction(int arr1[], int arr2[], int size) {
int result[size];
```

```
for (int i = 0; i < size; i++) {
result[i] = arr1[i] - arr2[i];
}

printf("Result of subtraction:\n");
for (int i = 0; i < size; i++) {
printf("%d ", result[i]);
}
printf("\n");
}

void performMultiplication(int arr1[], int arr2[], int size) {
int result[size];

for (int i = 0; i < size; i++) {
result[i] = arr1[i] * arr2[i];
}

printf("Result of multiplication:\n");
for (int i = 0; i < size; i++) {
printf("%d ", result[i]);
}
printf("\n");
}

int main() {
int size;

printf("Enter the size of the arrays: ");
scanf("%d", &size);

int arr1[size], arr2[size];

printf("Enter elements of the first array:\n");
for (int i = 0; i < size; i++) {
scanf("%d", &arr1[i]);
}

printf("Enter elements of the second array:\n");
for (int i = 0; i < size; i++) {
scanf("%d", &arr2[i]);
}

int choice;
do {
printf("\nMenu:\n");
printf("1. Addition\n");
printf("2. Subtraction\n");
printf("3. Multiplication\n");
printf("4. Exit\n");
printf("Enter your choice: ");
scanf("%d", &choice);

switch (choice) {
case 1:
performAddition(arr1, arr2, size);
break;
case 2:
performSubtraction(arr1, arr2, size);
break;
case 3:
performMultiplication(arr1, arr2, size);
break;
case 4:
printf("Exiting the program.\n");
break;
default:
printf("Invalid choice.\n");
}

} while (choice != 4);

return 0;
}
```

ANS 5.

```
#include <stdio.h>

void mergeSortedArrays(int arr1[], int size1, int arr2[], int size2, int mergedArray[]) {
int i = 0, j = 0, k = 0;

while (i < size1 && j < size2) {
if (arr1[i] < arr2[j]) {
mergedArray[k++] = arr1[i++];
} else {
mergedArray[k++] = arr2[j++];
}
}

while (i < size1) {
mergedArray[k++] = arr1[i++];
}
while (j < size2) {
mergedArray[k++] = arr2[j++];
}
}

int main() {
int size1, size2;

printf("Enter the size of the first sorted array: ");
scanf("%d", &size1);

int arr1[size1];

printf("Enter elements of the first sorted array:\n");
for (int i = 0; i < size1; i++) {
scanf("%d", &arr1[i]);
}

printf("Enter the size of the second sorted array: ");
scanf("%d", &size2);

int arr2[size2];

printf("Enter elements of the second sorted array:\n");
for (int i = 0; i < size2; i++) {
scanf("%d", &arr2[i]);
}

int mergedSize = size1 + size2;
int mergedArray[mergedSize];

mergeSortedArrays(arr1, size1, arr2, size2, mergedArray);

printf("Merged sorted array:\n");
for (int i = 0; i < mergedSize; i++) {
printf("%d ", mergedArray[i]);
}
printf("\n");

return 0;
}
```

Ans 6.

```
#include <stdio.h>
```

```
void findSecondMinMax(int arr[], int size, int *secondMax, int *secondMin) {
int max1 = arr[0], max2 = arr[0];
int min1 = arr[0], min2 = arr[0];

for (int i = 0; i < size; i++) {
if (arr[i] > max1) {
max2 = max1;
max1 = arr[i];
} else if (arr[i] > max2 && arr[i] < max1) {
max2 = arr[i];
}

if (arr[i] < min1) {
min2 = min1;
min1 = arr[i];
} else if (arr[i] < min2 && arr[i] > min1) {
min2 = arr[i];
}
}

*secondMax = max2;
*secondMin = min2;
}

int main() {
int size;
printf("Enter the size of the array: ");
scanf("%d", &size);

int arr[size];
printf("Enter the elements of the array:\n");
for (int i = 0; i < size; i++) {
scanf("%d", &arr[i]);
}

int secondMax, secondMin;
findSecondMinMax(arr, size, &secondMax, &secondMin);

printf("Second Maximum: %d\n", secondMax);
printf("Second Minimum: %d\n", secondMin);

return 0;
}
```