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#include <stdio.h>

#define MAX_SIZE 100

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

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

void linearSearch(int arr[], int size, int key) {
    int found = 0;
    printf("Linear Search Results:\n");
    for (int i = 0; i < size; i++) {
        if (arr[i] == key) {
            printf("Element %d found at index %d\n", key, i);
            found = 1;
        }
    }
    if (!found) {
        printf("Element %d not found in the array.\n", key);
    }
}

void insertElement(int arr[], int *size, int element, int position) {
    if (*size >= MAX_SIZE) {
        printf("Array is full. Cannot insert more elements.\n");
        return;
    }
    if (position < 0 || position > *size) {
        printf("Invalid position for insertion.\n");
        return;
    }
    for (int i = *size; i > position; i--) {
        arr[i] = arr[i - 1];
    }
    arr[position] = element;
    (*size)++;
    printf("Element %d inserted at position %d.\n", element, position);
}

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

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

void reverseArray(int arr[], int size) {
    printf("Array Reversed:\n");
    for (int start = 0, end = size - 1; start < end; start++, end--) {
        int temp = arr[start];
        arr[start] = arr[end];
        arr[end] = temp;
    }
}

void updateArray(int arr[], int size, int choice) {
    if (choice == 1) {
        printf("Multiplying odd-indexed elements by 2...\n");
        for (int i = 1; i < size; i += 2) {
            arr[i] *= 2;
        }
    } else if (choice == 2) {
        printf("Adding 5 to even-indexed elements...\n");
        for (int i = 0; i < size; i += 2) {
            arr[i] += 5;
        }
    } else {
        printf("Invalid choice for array update.\n");
    }
}

int main() {
    int choice, size, element, position, key;
    printf("Enter size of the array: ");
    scanf("%d", &size);
    int arr[MAX_SIZE];

    inputArray(arr, size);

    do {
        printf("\nMenu:\n");
        printf("1. Display Array\n");
        printf("2. Linear Search\n");
        printf("3. Insert Element\n");
        printf("4. Delete Element\n");
        printf("5. Reverse Array\n");
        printf("6. Update Array (Multiply odd-indexed elements by 2)\n");
        printf("7. Update Array (Add 5 to even-indexed elements)\n");
        printf("0. Exit\n");
        printf("Enter your choice: ");
        scanf("%d", &choice);

        switch (choice) {
            case 1:
                displayArray(arr, size);
                break;

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    case 2:
        printf("Enter element to search: ");
        scanf("%d", &key);
        linearSearch(arr, size, key);
        break;
    case 3:
        printf("Enter element to insert: ");
        scanf("%d", &element);
        printf("Enter position to insert: ");
        scanf("%d", &position);
        insertElement(arr, &size, element, position);
        break;
    case 4:
        printf("Enter position to delete: ");
        scanf("%d", &position);
        deleteElement(arr, &size, position);
        break;
    case 5:
        reverseArray(arr, size);
        break;
    case 6:
        updateArray(arr, size, 1);
        break;
    case 7:
        updateArray(arr, size, 2);
        break;
    case 0:
        printf("Exiting program.\n");
        break;
    default:
        printf("Invalid choice! Please enter a number between 0 and 7.\n");
}
} while (choice != 0);

return 0;
}

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