DS Lab Assignment - 1

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Q1

void create() {

printf("Enter the number of elements (max %d): ", MAX);

scanf("%d", &n);

if (n > MAX || n < 0) {

printf("Invalid number of elements.\n");

n = 0;

return;

}

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

printf("arr[%d] = ", i);

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

}

}

void display() {

printf("Array elements: ");

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

printf("%d ", arr[i]);

}

printf("\n");

}

void insert\_elem() {

int pos, val;

printf("Enter position (0 to %d): ", n);

scanf("%d", &pos);

if (pos < 0 || pos > n) {

printf("Invalid position.\n");

return;

}

printf("Enter value to insert: ");

scanf("%d", &val);

for (int i = n; i > pos; i--) {

arr[i] = arr[i - 1];

}

arr[pos] = val;

n++;

printf("Inserted %d at position %d.\n", val, pos);

}

void delete\_elem() {

int pos, deleted;

printf("Enter position to delete (0 to %d): ", n - 1);

scanf("%d", &pos);

if (pos < 0 || pos >= n) {

printf("Invalid position.\n");

return;

}

deleted = arr[pos];

for (int i = pos; i < n - 1; i++) {

arr[i] = arr[i + 1];

}

n--;

printf("Deleted element %d from position %d.\n", deleted, pos);

}

void linear\_search() {

int k;

printf("Enter element to search: ");

scanf("%d", &k);

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

if (arr[i] == k) {

printf("Element %d found at index %d.\n", k, i);

return;

}

}

printf("Element %d not found in array.\n", key);

}

int main() {

int choice;

while (1) {

printf("\n——MENU——\n");

printf("1. CREATE\n");

printf("2. DISPLAY\n");

printf("3. INSERT\n");

printf("4. DELETE\n");

printf("5. LINEAR SEARCH\n");

printf("6. EXIT\n");

printf("Enter your choice: ");

scanf("%d", &choice);

switch (choice) {

case 1: create(); break;

case 2: display(); break;

case 3: insert\_elem(); break;

case 4: delete\_elem(); break;

case 5: linear\_search(); break;

case 6: exit(0);

default: printf("Invalid choice. Please choose between 1-6.\n");

}

}

return 0;

}

Q2

int arr[7]={1,1,2,2,2,3,3};

int n=sizeof(arr)/sizeof(arr[0]);

set<int> st;

for (int i = 0; i < n; i++)

{

st.insert(arr[i]);

}

Q3

Output= 1000

Q4

A

int i=0,j=n-1;

while(i<j){

swap(arr[i],arr[j]);

i++;

j--;

}

Q4

B

for (int i = 0; i < row\_a; ++i) {

for (int j = 0; j < column\_a; ++j) {

for (int k = 0; k < row\_b; ++k) {

C[i][j] += A[i][k] \* B[k][j];

}

}

}

Q4

C

int brr[3][3];

for (int i = 0; i < n; i++)

{

for (int j = 0; j < n; j++)

{

swap(brr[i],brr[j]);

}

}

Q5

// Sum of each row

cout << "Sum of each row:\n";

for (int i = 0; i < rows; ++i) {

int rowSum = 0;

for (int j = 0; j < cols; ++j) {

rowSum += arr[i][j];

}

cout << "Row " << i + 1 << ": " << rowSum << endl;

}

// Sum of each column

cout << "\nSum of each column:\n";

for (int j = 0; j < cols; ++j) {

int colSum = 0;

for (int i = 0; i < rows; ++i) {

colSum += arr[i][j];

}