Assignment 1

Question 1:

```c
#include <stdio.h>
int main() {
    int arr[100], n=0, ch, i, pos, val, key, found;
    do {
        printf("\n1.CREATE\n2.DISPLAY\n3.INSERT\n4.DELETE\n5.SEARCH\n6.EXIT\nChoice: ");
        scanf("%d", &ch);

        if(ch==1) {
            printf("How many elements? ");
            scanf("%d", &n);
            printf("Enter elements: ");
            for(i=0;i<n;i++) scanf("%d", &arr[i]);
        }
        else if(ch==2) {
            if(n==0) printf("Array empty\n");
            else {
                for(i=0;i<n;i++) printf("%d ", arr[i]);
                printf("\n");
            }
        }
        else if(ch==3) {
            printf("Position and value: ");
            scanf("%d%d", &pos, &val);
            if(pos<0 || pos>n) printf("Invalid pos\n");
            else {
                for(i=n;i>pos;i--) arr[i]=arr[i-1];
                arr[pos]=val;
                n++;
            }
        }
        else if(ch==4) {
            printf("Position to delete: ");
            scanf("%d", &pos);
            if(pos<0 || pos>=n) printf("Invalid pos\n");
            else {
                for(i=pos;i<n-1;i++) arr[i]=arr[i+1];
                n--;
            }
        }
        else if(ch==5) {
```

```c
            printf("Value to search: ");
            scanf("%d", &key);
            found=0;
            for(i=0;i<n;i++) {
                if(arr[i]==key) { printf("Found at %d\n", i); found=1; break; }
            }
            if(!found) printf("Not found\n");
        }
        else if(ch==6) {
            printf("Bye!\n");
        }
        else {
            printf("Wrong choice\n");
        }
    } while(ch!=6);
    return 0;
}
```

Question 2:

```c
#include <stdio.h>

int main() {
    int a[100], n, i, j, k;
    printf("How many elements? ");
    scanf("%d", &n);
    printf("Enter %d elements: ", n);
    for(i=0;i<n;i++) scanf("%d", &a[i]);

    for(i=0;i<n;i++) {
        for(j=i+1;j<n;j++) {
            if(a[i]==a[j]) {
                for(k=j;k<n-1;k++) a[k]=a[k+1];
                n--;
                j--;
            }
        }
    }

    printf("Array after removing duplicates: ");
    for(i=0;i<n;i++) printf("%d ", a[i]);
    printf("\n");

    return 0;
}
```

Question 3:
The output will be '10000' because if we partially initialize an array then the remaining rest of the elements are automatically set to 0.

Question 4 (a):
```c
#include <stdio.h>

int main() {
    int a[100], n, i, temp;
    printf("How many elements? ");
    scanf("%d", &n);
    printf("Enter %d elements: ", n);
    for(i=0;i<n;i++) scanf("%d", &a[i]);

    for(i=0;i<n/2;i++) {
        temp = a[i];
        a[i] = a[n-1-i];
        a[n-1-i] = temp;
    }

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

(b)
```c
#include <stdio.h>

int main() {
    int a[10][10], b[10][10], c[10][10], r1, c1, r2, c2, i, j, k;
    printf("Enter rows & cols of 1st matrix: ");
    scanf("%d%d", &r1, &c1);
    printf("Enter rows & cols of 2nd matrix: ");
    scanf("%d%d", &r2, &c2);

    if(c1!=r2) {
        printf("Multiplication not possible\n");
        return 0;
    }

    printf("Enter elements of 1st matrix:\n");
    for(i=0;i<r1;i++)
```

```c
        for(j=0;j<c1;j++)
            scanf("%d", &a[i][j]);

    printf("Enter elements of 2nd matrix:\n");
    for(i=0;i<r2;i++)
        for(j=0;j<c2;j++)
            scanf("%d", &b[i][j]);

    for(i=0;i<r1;i++)
        for(j=0;j<c2;j++) {
            c[i][j] = 0;
            for(k=0;k<c1;k++)
                c[i][j] += a[i][k] * b[k][j];
        }

    printf("Result matrix:\n");
    for(i=0;i<r1;i++) {
        for(j=0;j<c2;j++)
            printf("%d ", c[i][j]);
        printf("\n");
    }
    return 0;
}
```

(c) #include <stdio.h>

```c
int main() {
    int a[10][10], t[10][10], r, c, i, j;
    printf("Enter rows and cols: ");
    scanf("%d%d", &r, &c);

    printf("Enter elements:\n");
    for(i=0;i<r;i++)
        for(j=0;j<c;j++)
            scanf("%d", &a[i][j]);

    for(i=0;i<r;i++)
        for(j=0;j<c;j++)
            t[j][i] = a[i][j];

    printf("Transpose:\n");
    for(i=0;i<c;i++) {
        for(j=0;j<r;j++)
            printf("%d ", t[i][j]);
```

```c
        printf("\n");
    }
    return 0;
}
```

Question 5:

```c
#include <stdio.h>

int main() {
    int a[10][10], r, c, i, j, sum;
    printf("Enter rows and cols: ");
    scanf("%d%d", &r, &c);

    printf("Enter elements:\n");
    for(i=0;i<r;i++)
        for(j=0;j<c;j++)
            scanf("%d", &a[i][j]);

    for(i=0;i<r;i++) {
        sum = 0;
        for(j=0;j<c;j++) sum += a[i][j];
        printf("Sum of row %d = %d\n", i+1, sum);
    }

    for(j=0;j<c;j++) {
        sum = 0;
        for(i=0;i<r;i++) sum += a[i][j];
        printf("Sum of col %d = %d\n", j+1, sum);
    }

    return 0;
}
```