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Program 1:

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

    int a[n], freq[n+1];
    for(int i = 0; i <= n; i++)
        freq[i] = 0;

    for(int i = 0; i < n; i++) {
        scanf("%d", &a[i]);
        if(freq[a[i]] == 1) {
            printf("%d\n", a[i]);
            return 0;
        }
        freq[a[i]] = 1;
    }
    return 0;
}
```

Output:

	Input	Expected	Got	
✓	11 10 9 7 6 5 1 2 3 8 4 7	7	7	✓
✓	5 1 2 3 4 4	4	4	✓
✓	5 1 1 2 3 4	1	1	✓

Passed all tests! ✓

Program 2:

```
#include <stdio.h>
int main() {
    int n, x;
    scanf("%d", &n);
    int freq[n+1];
    for(int i = 0; i <= n; i++)
        freq[i] = 0;

    for(int i = 0; i < n; i++) {
        scanf("%d", &x);
        if(freq[x] == 1) {
            printf("%d", x);
            return 0;
        }
        freq[x] = 1;
    }
    return 0;
}
```

Output:

	Input	Expected	Got	
✓	11 10 9 7 6 5 1 2 3 8 4 7	7	7	✓
✓	5 1 2 3 4 4	4	4	✓
✓	5 1 1 2 3 4	1	1	✓

Passed all tests! ✓

Program 3:

```
#include <stdio.h>
int main() {
    int T;
    scanf("%d", &T);
    while(T--) {
        int n1, n2;
        scanf("%d", &n1);
```

```

int A[n1];
for(int i = 0; i < n1; i++)
    scanf("%d", &A[i]);
scanf("%d", &n2);
int B[n2];
for(int i = 0; i < n2; i++)
    scanf("%d", &B[i]);
int i = 0, j = 0;
while(i < n1 && j < n2) {
    if(A[i] == B[j]) {
        printf("%d ", A[i]);
        i++;
        j++;
    }
    else if(A[i] < B[j])
        i++;
    else
        j++;
}
printf("\n");
}
return 0;
}

```

Output:

	Input	Expected	Got	
✓	1 3 10 17 57 6 2 7 10 15 57 246	10 57	10 57	✓
✓	1 6 1 2 3 4 5 6 2 1 6	1 6	1 6	✓

Passed all tests! ✓

Program 4:  
#include <stdio.h>

```

int main() {
    int T;
    scanf("%d", &T);
    while(T--) {
        int n1;
        scanf("%d", &n1);
        int A[n1];
        for(int i = 0; i < n1; i++)
            scanf("%d", &A[i]);
        int n2;
        scanf("%d", &n2);
        int B[n2];
        for(int i = 0; i < n2; i++)
            scanf("%d", &B[i]);
        int i = 0, j = 0;
        while(i < n1 && j < n2) {
            if(A[i] == B[j]) {
                printf("%d ", A[i]);
                i++; j++;
            }
            else if(A[i] < B[j])
                i++;
            else
                j++;
        }
        printf("\n");
    }
    return 0;
}

```

Output:

	Input	Expected	Got	
✓	1 3 10 17 57 6 2 7 10 15 57 246	10 57	10 57	✓
✓	1 6 1 2 3 4 5 6 2 1 6	1 6	1 6	✓

Passed all tests! ✓

Program 5:

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

```
int main() {
```

```
    int n, k;
```

```
    scanf("%d", &n);
```

```
    int A[n];
```

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

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

```
    scanf("%d", &k);
```

```
    int i = 0, j = 1;
```

```
    while(j < n) {
```

```
        int diff = A[j] - A[i];
```

```
        if(diff == k && i != j) {
```

```
            printf("1");
```

```
            return 0;
```

```
        }
```

```
        else if(diff < k)
```

```
            j++;
```

```
        else
```

```
            i++;
```

```
        if(i == j) j++;
```

```
    }
```

```
    printf("0");
```

```
    return 0;
```

```
}
```

Output:

	Input	Expected	Got	
✓	3 1 3 5 4	1	1	✓
✓	10 1 4 6 8 12 14 15 20 21 25 1	1	1	✓
✓	10 1 2 3 5 11 14 16 24 28 29 0	0	0	✓
✓	10 0 2 3 7 13 14 15 20 24 25 10	1	1	✓

Passed all tests! ✓

Program 6:

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

```
int main() {
```

```
    int n, k;
```

```
    scanf("%d", &n);
```

```
    int A[n];
```

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

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

```
    scanf("%d", &k);
```

```
    int i = 0, j = 1;
```

```
    while (j < n) {
```

```
        int diff = A[j] - A[i];
```

```
        if (diff == k && i != j) {
```

```
            printf("1");
```

```
            return 0;
```

```
        }
```

```
        else if (diff < k)
```

```
            j++;
```

```
        else
```

```

        i++;
        if (i == j)
            j++;
    }
    printf("0");
    return 0;
}

```

Output:

	Input	Expected	Got	
✓	3 1 3 5 4	1	1	✓
✓	10 1 4 6 8 12 14 15 20 21 25 1	1	1	✓
✓	10 1 2 3 5 11 14 16 24 28 29 0	0	0	✓
✓	10 0 2 3 7 13 14 15 20 24 25 10	1	1	✓

Passed all tests! ✓