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//An implementation of binary search algorithm (Algorithm 4.2)
//written by Kazutoshi Ando (Shizuoka University)

#include <stdio.h>
#define n 16

void show_array(int A[], int l) {//配列の中身を表示する関数
  int i;
  printf("[");
  for (i=0;i<l;i++) {
    printf(" %2d",A[i]);
    if(i<l-1) printf(",");
  }
  printf("]\n");

}

void bin_search(int D[], int x) {// 2分探索法 (アルゴリズム  4.2)
  int left=0, right=n-1, mid = (left + right)/2;
  while (left<right) {
    if (D[mid] == x) {
      printf(" D[%d] == %d\n", mid, D[mid]);
      exit(0);
    } else if (D[mid]<x) {
      left = mid +1;
    } else {
      right = mid -1;
    }
    mid = (left + right)/2;
  }
  if (D[mid]==x)
    printf(" D[%d] == %d\n", mid, D[mid]);
  else {
    printf(" %d is not found in D[]\n",x);
  }
}

main() {
  int D[n]={1,2,5,6,9,11,13,15,17,20,23,24,28,29,33,39};
  show_array(D,n);

  bin_search(D,23);

}

/* 上のメイン関数を以下のメイン関数で置き換えてもよい          .
main(int argc, char *argv[]) {
  int D[n]={1,2,5,6,9,11,13,15,17,20,23,24,28,29,33,39};
  show_array(D,n);

  int x = atoi(argv[1]);
  bin_search(D,x);
}
*/
```