

Application Based on Merge Sort

Title : Online Shopping Price Manager

Program Code :

```
#include <stdio.h>

#include <string.h>

#define SIZE 50

struct Product {
    char name[50];
    float price;
};

void merge(struct Product arr[], int left, int mid, int right) {
    int n1 = mid - left + 1;
    int n2 = right - mid;

    struct Product L[n1], R[n2];    // ? Variable Length Arrays
    (modern C)

    int i, j, k;

    // Copy left half
    for (i = 0; i < n1; i++)
        L[i] = arr[left + i];

    // Copy right half
```

```

    for (j = 0; j < n2; j++)
        R[j] = arr[mid + 1 + j];

    i = 0;

    j = 0;

    k = left;

// Merge two halves

    while (i < n1 && j < n2) {
        if (L[i].price <= R[j].price)    // ascending order
            arr[k++] = L[i++];
        else
            arr[k++] = R[j++];
    }

// Copy remaining elements

    while (i < n1)
        arr[k++] = L[i++];

    while (j < n2)
        arr[k++] = R[j++];

}

void mergeSort(struct Product arr[], int left, int right) {
    if (left < right) {

```

```

        int mid = (left + right) / 2;
        mergeSort(arr, left, mid);
        mergeSort(arr, mid + 1, right);
        merge(arr, left, mid, right);
    }
}

int main()
{
    struct Product arr[SIZE];

    int n, i;

    printf("Enter number of products (max %d): ", SIZE);
    scanf("%d", &n);

    for (i = 0; i < n; i++) {
        printf("\nEnter details for Product %d\n", i + 1);
        printf("Name: ");
        scanf(" %[^\n]", arr[i].name);
        printf("Price: ");
        scanf("%f", &arr[i].price);
    }

    mergeSort(arr, 0, n - 1);

```

```
printf("\nProducts sorted by Price (lowest first):\n");

printf("Name\t\tPrice\n");

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

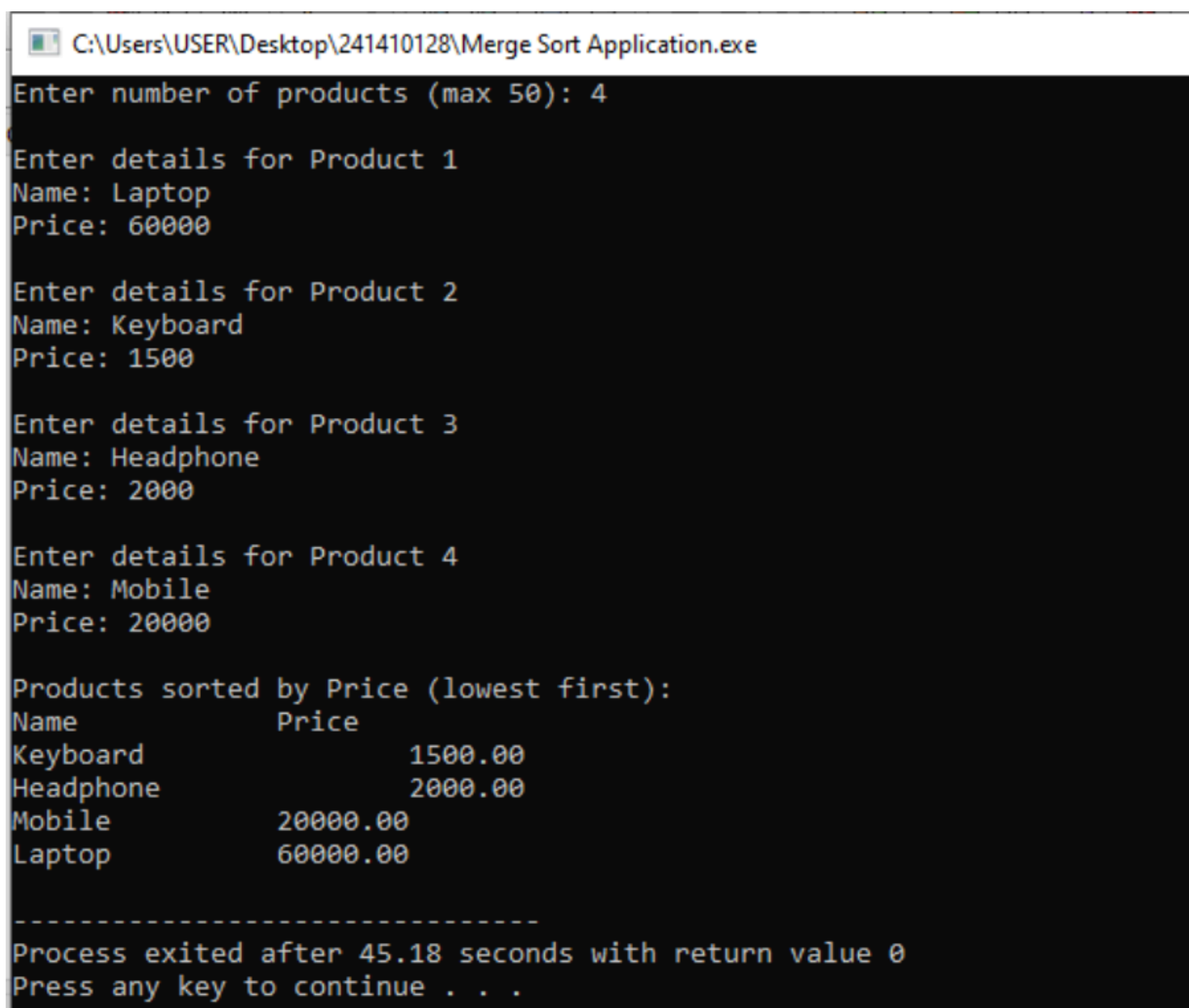
    printf("%s\t\t%.2f\n", arr[i].name, arr[i].price);

}

return 0;

}
```

Output :



```
C:\Users\USER\Desktop\241410128\Merge Sort Application.exe
Enter number of products (max 50): 4

Enter details for Product 1
Name: Laptop
Price: 60000

Enter details for Product 2
Name: Keyboard
Price: 1500

Enter details for Product 3
Name: Headphone
Price: 2000

Enter details for Product 4
Name: Mobile
Price: 20000

Products sorted by Price (lowest first):
Name          Price
Keyboard          1500.00
Headphone         2000.00
Mobile           20000.00
Laptop           60000.00

-----
Process exited after 45.18 seconds with return value 0
Press any key to continue . . .
```

