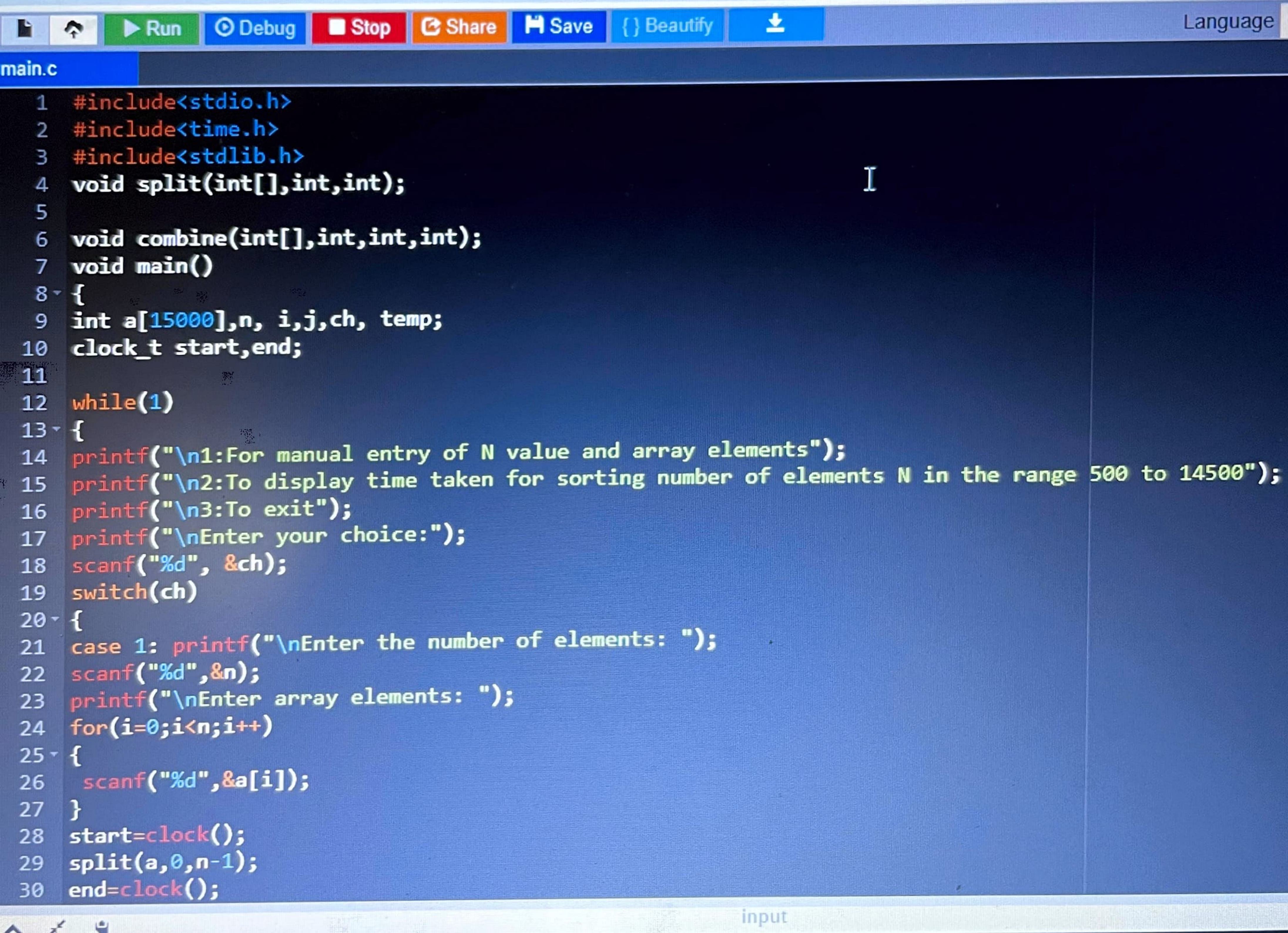
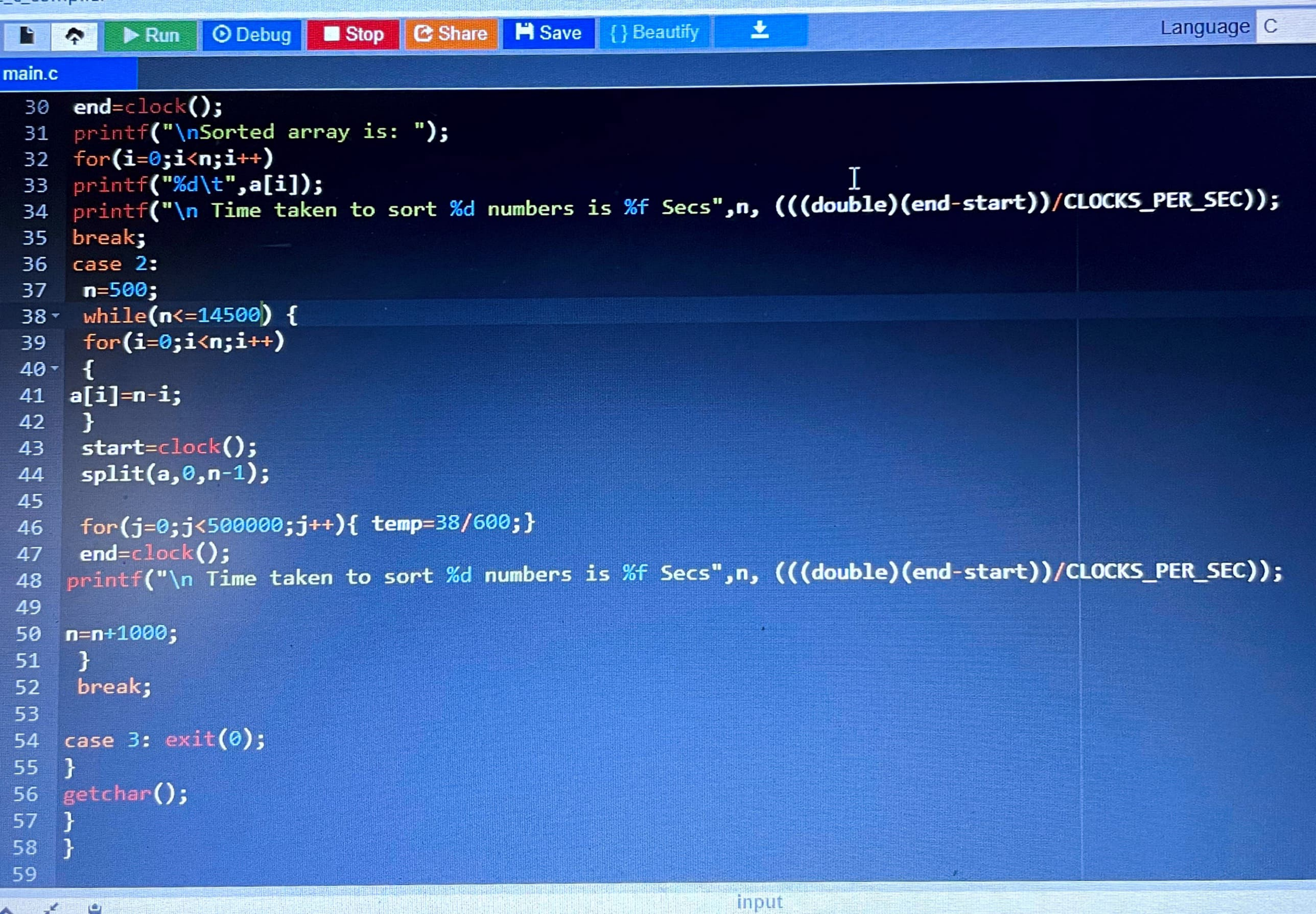
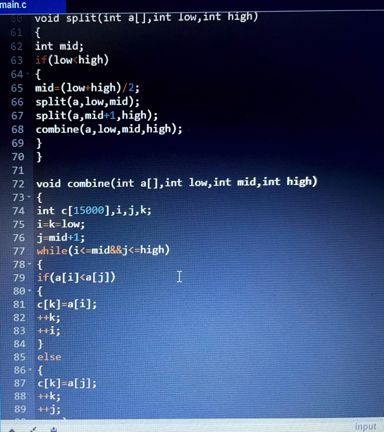


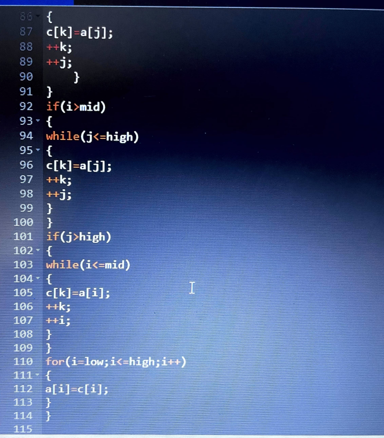
```c
#include<stdio.h>
#include<time.h>
#include<stdlib.h>
void split(int[],int,int);

void combine(int[],int,int,int);
void main()
{
int a[15000],n, i,j,ch, temp;
clock_t start,end;

while(1)
{
printf("\n1:For manual entry of N value and array elements");
printf("\n2:To display time taken for sorting number of elements N in the range 500 to 14500");
printf("\n3:To exit");
printf("\nEnter your choice:");
scanf("%d", &ch);
switch(ch)
{
case 1: printf("\nEnter the number of elements: ");
scanf("%d",&n);
printf("\nEnter array elements: ");
for(i=0;i<n;i++)
{
 scanf("%d",&a[i]);
}
start=clock();
split(a,0,n-1);
end=clock();
```



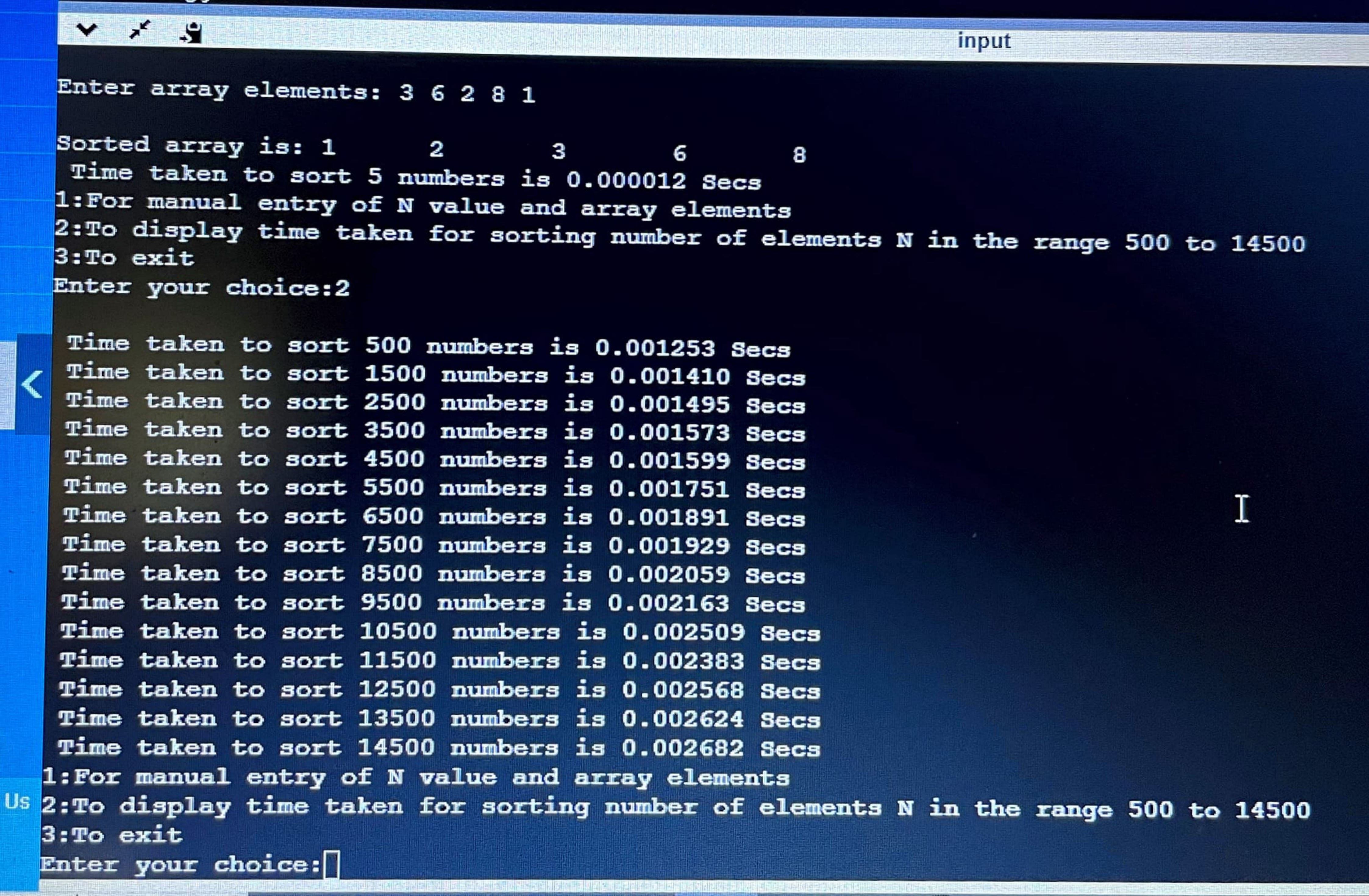
```
end=clock();
printf("\nSorted array is: ");
for(i=0;i<n;i++)
printf("%d\t",a[i]);
printf("\n Time taken to sort %d numbers is %f Secs",n, (((double)(end-start))/CLOCKS_PER_SEC));
break;
case 2:
 n=500;
 while(n<=14500) {
 for(i=0;i<n;i++)
 {
a[i]=n-i;
 }
 start=clock();
 split(a,0,n-1);

 for(j=0;j<500000;j++){ temp=38/600;}
 end=clock();
printf("\n Time taken to sort %d numbers is %f Secs",n, (((double)(end-start))/CLOCKS_PER_SEC));

n=n+1000;
 }
 break;

case 3: exit(0);
}
getchar();
}
}

```



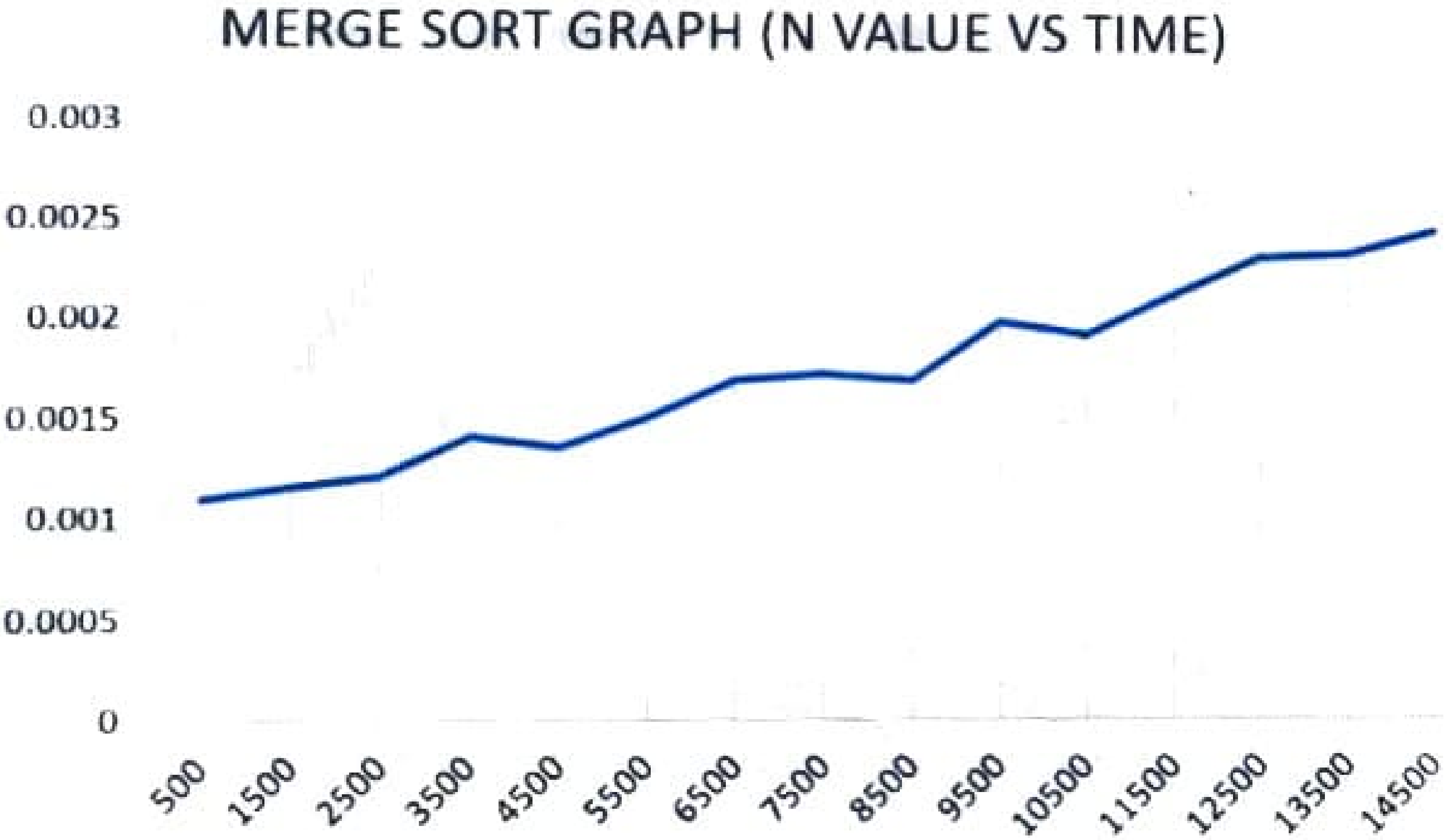
```c
void split(int a[],int low,int high)
{
int mid;
if(low<high)
{
mid=(low+high)/2;
split(a,low,mid);
split(a,mid+1,high);
combine(a,low,mid,high);
}
}

void combine(int a[],int low,int mid,int high)
{
int c[15000],i,j,k;
i=k=low;
j=mid+1;
while(i<=mid&&j<=high)
{
if(a[i]<a[j])
{
c[k]=a[i];
++k;
++i;
}
else
{
c[k]=a[j];
++k;
++j;
```



```
{
c[k]=a[j];
++k;
++j;
    }
}
if(i>mid)
{
while(j<=high)
{
c[k]=a[j];
++k;
++j;
}
}
if(j>high)
{
while(i<=mid)
{
c[k]=a[i];
++k;
++i;
}
}
for(i=low;i<=high;i++)
{
a[i]=c[i];
}
}

```



```
Enter array elements: 3 6 2 8 1

Sorted array is: 1       2       3       6       8
 Time taken to sort 5 numbers is 0.000012 Secs
1:For manual entry of N value and array elements
2:To display time taken for sorting number of elements N in the range 500 to 14500
3:To exit
Enter your choice:2

 Time taken to sort 500 numbers is 0.001253 Secs
 Time taken to sort 1500 numbers is 0.001410 Secs
 Time taken to sort 2500 numbers is 0.001495 Secs
 Time taken to sort 3500 numbers is 0.001573 Secs
 Time taken to sort 4500 numbers is 0.001599 Secs
 Time taken to sort 5500 numbers is 0.001751 Secs
 Time taken to sort 6500 numbers is 0.001891 Secs
 Time taken to sort 7500 numbers is 0.001929 Secs
 Time taken to sort 8500 numbers is 0.002059 Secs
 Time taken to sort 9500 numbers is 0.002163 Secs
 Time taken to sort 10500 numbers is 0.002509 Secs
 Time taken to sort 11500 numbers is 0.002383 Secs
 Time taken to sort 12500 numbers is 0.002568 Secs
 Time taken to sort 13500 numbers is 0.002624 Secs
 Time taken to sort 14500 numbers is 0.002682 Secs
1:For manual entry of N value and array elements
2:To display time taken for sorting number of elements N in the range 500 to 14500
3:To exit
Enter your choice:
```



MERGE SORT GRAPH (N VALUE VS TIME)