void quicksort(int a[25],int first, int last)

{

if(first<last){

pivot=first;

i=first;

j=last;

while(i<j)

{

while(a[i]<=a[pivot]&& i<last)

i++;

while(a[j]>a[pivot])

j--;

if(i<j)

{

temp=a[i];

a[i]=a[j];

a[j]=temp;

}

}

temp=a[pivot];

a[pivot]=a[j];

a[j]=temp;

quicksort(a,first,j-1);

quicksort(a,j+1,last);

}

}

**I iteration**

| 65 | 70 | 75 | 80 | 85 | 60 | 55 | 50 | 45 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| First | Last | Pivot | I | J |  |  |  |  |
| 0 | 8 | 0 | 0 | 8 |  |  |  |  |
| while(i<j)----0<8 | | | | | | | | |
| while(a[i]<=a[pivot]&& i<last) a[0]<=a[0]---65<=65  i++; | | | | | | | | |
|  |  |  | 1 |  |  |  |  |  |
| while(a[i]<=a[pivot]&&i<last) a[1]<=a[0]----70<=65  i++; | | | | | | | | |
| while(a[j]>a[pivot]) a[8]>a[0]---45>65  j-- | | | | | | | | |
|  |  |  | 1 | 8 |  |  |  |  |
| 65 | 45 | 75 | 80 | 85 | 60 | 55 | 50 | 70 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

**II iteration**

| 65 | 45 | 75 | 80 | 85 | 60 | 55 | 50 | 70 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| First | Last | Pivot | I | J |  |  |  |  |
| while(i<j) 1<8 | | | | | | | | |
| while(a[i]<=a[pivot]&&i<last) a[1]<=a[0]---45<=65  i++; | | | | | | | | |
|  |  |  | 2 |  |  |  |  |  |
| while(a[i]<=a[pivot]&&i<last) a[2]<=a[0]----75<=65  i++; | | | | | | | | |
| while(a[j]>a[pivot]) a[8]>a[0]---70>65  j-- | | | | | | | | |
|  |  |  |  | 7 |  |  |  |  |
|  |  |  | 2 | 7 |  |  |  |  |
| 65 | 45 | 50 | 80 | 85 | 60 | 55 | 75 | 70 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

**III iteration**

| 65 | 45 | 50 | 80 | 85 | 60 | 55 | 75 | 70 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| First | Last | Pivot | I | J |  |  |  |  |
| while(i<j) 2<7 | | | | | | | | |
| while(a[i]<=a[pivot]&&i<last) a[2]<=a[0]---50<=65  i++; | | | | | | | | |
|  |  |  | 3 |  |  |  |  |  |
| while(a[i]<=a[pivot]&&i<last) a[3]<=a[0]----80<=65  i++; | | | | | | | | |
| while(a[j]>a[pivot]) a[7]>a[0]---75>65  j-- | | | | | | | | |
|  |  |  |  | 6 |  |  |  |  |
| while(a[j]>a[pivot]) a[6]>a[0]---55>65  j-- | | | | | | | | |
|  |  |  | 3 | 6 |  |  |  |  |
| 65 | 45 | 50 | 55 | 85 | 60 | 80 | 75 | 70 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

**IV iteration**

| 65 | 45 | 50 | 55 | 85 | 60 | 80 | 75 | 70 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| First | Last | Pivot | I | J |  |  |  |  |
| while(i<j) 3<6 | | | | | | | | |
| while(a[i]<=a[pivot]&&i<last) a[3]<=a[0]---55<=65  i++; | | | | | | | | |
|  |  |  | 4 |  |  |  |  |  |
| while(a[i]<=a[pivot]&&i<last) a[4]<=a[0]----85<=65  i++; | | | | | | | | |
| while(a[j]>a[pivot]) a[6]>a[0]---80>65  j-- | | | | | | | | |
|  |  |  |  | 5 |  |  |  |  |
| while(a[j]>a[pivot]) a[5]>a[0]---60>65  j-- | | | | | | | | |
|  |  |  | 4 | 5 |  |  |  |  |
| **65** | **45** | **50** | **55** | **60** | **85** | **80** | **75** | **70** |
| **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |

**V iteration**

| **65** | | **45** | | **50** | | **55** | | **60** | | **85** | | **80** | | **75** | **70** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **0** | | **1** | | **2** | | **3** | | **4** | | **5** | | **6** | | **7** | **8** | |
| First | | Last | | Pivot | | I | | J | |  | |  | |  |  | |
| while(i<j) 4<5 | | | | | | | | | | | | | | | | |
| while(a[i]<=a[pivot]&&i<last) a[4]<=a[0]---60<=65  i++; | | | | | | | | | | | | | | | | |
|  |  | |  | |  | | 5 | |  | |  | |  | | |  |
| while(a[i]<=a[pivot]&&i<last) a[5]<=a[0]---85<=65  i++; | | | | | | | | | | | | | | | | |
| while(a[j]>a[pivot]) a[5]>a[0]---85>65  j-- | | | | | | | | | | | | | | | | |
|  | |  | |  | |  | | 4 | |  | |  | |  |  | |
|  | |  | |  | | 5 | | 4 | |  | |  | |  |  | |

| **65** | **45** | **50** | **55** | **60** | **85** | **80** | **75** | **70** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |

| **60** | **45** | **50** | **55** | **65** | **85** | **80** | **75** | **70** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |

`

| **60** | **45** | **50** | **55** | **65** | **85** | **80** | **75** | **70** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |



| **55** | **45** | **50** | **60** |
| --- | --- | --- | --- |
| **0** | **1** | **2** | **3** |
| **70** | **80** | **75** | **85** |
| **5** | **6** | **7** | **8** |

| **70** | **80** | **75** | **85** |
| --- | --- | --- | --- |
| **5** | **6** | **7** | **8** |

| **50** | **45** | **55** | **60** |
| --- | --- | --- | --- |
| **0** | **1** | **2** | **3** |
| **70** | **75** | **80** | **85** |
| **5** | **6** | **7** | **8** |

| **45** | **50** | **55** | **60** |
| --- | --- | --- | --- |
| **0** | **1** | **2** | **3** |

