**Student Class:**

public class Student {  
 private String studentNumber;  
 private String name;  
 char gender;  
 private char grade;  
 public Student(String studentNumber, String name, char gender, char  
 grade) {  
 this.studentNumber = studentNumber;  
 this.name = name;  
 this.gender = gender;  
 this.grade = grade;  
 }  
 public String getStudentNumber() {  
 return studentNumber;  
 }  
 public String getName() {  
 return name;  
 }  
 public char getGender() {  
 return gender;  
 }  
 public char getGrade() {  
 return grade;  
 }  
}

**StudentList Class:**

public class StudentList {  
 private int maxSize;  
 private int position;  
 private Student[] listEntry;  
 StudentList(int n){  
 maxSize=n;  
 listEntry=new Student[maxSize];  
 position=-1;  
 }  
 boolean isListEmpty(){  
 return (position==-1);  
 }  
 boolean isListFull(){  
 return (position==maxSize-1);  
 }  
 int listSize(){  
 return (position+1);  
 }  
 void insertLast(Student data){  
 if (isListFull()){System.*out*.println("List is full.");  
 }  
 else {  
 listEntry[++position]=data;  
 }  
 }  
 void insert(int p,Student data){  
 if (isListFull()){  
 System.*out*.println("List is full.");  
 } else if (p<0 || p>listSize()) {  
 System.*out*.println("Not in the range.");  
 }  
 else {  
 for (int i=listSize();i>p;i--){  
 listEntry[i]=listEntry[i-1];  
 }  
 listEntry[p]=data;  
 position++;  
 }  
 }  
 Student delete(int p){  
 if (isListEmpty()){  
 System.*out*.println("List is empty.");  
 } else if (p>0 || p<listSize()) {  
 System.*out*.println("Not in the range.");  
 }  
 else {  
 Student element=listEntry[p];  
 for (int i=p;i<listSize()-1;i++){  
 listEntry[i]=listEntry[i+1];  
 }  
 position--;  
 return element;  
 }  
 return null;  
 }  
 Student retrieveList(int p){  
 if (isListEmpty()){  
 System.*out*.println("List is empty.");  
 } else if (p<0 || p>listSize()) {  
 System.*out*.println("Not in the range.");  
 }  
 else {  
 Student element=listEntry[p];  
 return element;  
 }  
 return null;  
 }  
 void replace(int p,Student data){  
 if (isListEmpty()){  
 System.*out*.println("List is empty.");  
 } else if (p<0 || p>listSize()) {  
 System.*out*.println("Not in the range.");  
 }  
 else {  
 listEntry[p]=data;  
 }  
 }  
 void traverseList(){  
 for (int i=0;i<listSize();i++){  
 System.*out*.println("Student Number:"+listEntry[i].getStudentNumber()+" | Student Name:"+listEntry[i].getName()+" | Gender:"+listEntry[i].getGender()+" | Grade:"+listEntry[i].getGrade());  
 }  
 }  
 void sort(){  
 for (int i = 0; i < listEntry.length; i++) {  
 int j = i;  
 while (j > 0) {  
 if (listEntry[j].getGrade() < listEntry[j - 1].getGrade())  
 { Student temp = listEntry[j];  
 listEntry[j] = listEntry[j - 1];  
 listEntry[j - 1] = temp;  
 }  
 j--; }  
 }  
 }  
 public Student[] binarySearch(char target){  
 return binarySearch(target,0,listSize()-1);  
 }  
 private Student[] binarySearch(char target,int min, int max){  
 if (min>max){  
 return null;  
 }  
 else {  
 int mid=(min+max)/2;  
 if (listEntry[mid].getGrade()==target){  
 int start=mid;  
 int end=mid;  
 while (start>min && listEntry[start-1].getGrade()==target){  
 start--;  
 }  
 while (end<max && listEntry[end+1].getGrade()==target){  
 end++;  
 }  
 Student[] result=new Student[end-start+1];  
 System.*arraycopy*(listEntry,start,result,0,end-start+1);  
 return result;  
 } else if (listEntry[mid].getGrade()<target) {  
 return binarySearch(target,mid+1,max);  
 }  
 else {  
 return binarySearch(target,min,mid-1);  
 }  
 }  
 }  
}

**Main Class:**

import java.util.Scanner;  
  
public class Main {  
 public static void main(String[] args) {  
 StudentList stList=new StudentList(10);  
 stList.insertLast(new Student("PS/2017/280","Kamal",'M','B'));  
 stList.insertLast(new Student("PS/2017/149","Nirmal",'F','B'));  
 stList.insertLast(new Student("PS/2017/045","Sarath",'M','C'));  
 stList.insertLast(new Student("PS/2017/73","Kasuni",'F','A'));  
 stList.insertLast(new Student("PS/2017/301","Chanaka",'M','C'));  
 stList.insertLast(new Student("PS/2017/312","Akila",'F','A'));  
 stList.insertLast(new Student("PS/2017/105","Dasuni",'F','A'));  
 stList.insertLast(new Student("PS/2017/016","Amal",'M','A'));  
 stList.insertLast(new Student("PS/2017/198","Binura",'M','B'));  
 stList.insertLast(new Student("PS/2017/151","Sithara",'F','A'));  
 stList.traverseList();  
 System.*out*.println();  
 stList.sort();  
 System.*out*.println("After sorting:-");  
 stList.traverseList();  
 System.*out*.println();  
 Scanner input=new Scanner(System.*in*);  
 System.*out*.print("Enter Grade: ");  
 char grade=input.next().charAt(0);  
 Student[] result = stList.binarySearch(grade); if (result != null)  
 {  
 System.*out*.println("Students with Grade " + grade + ":"); for  
 (Student student : result) {  
 System.*out*.println(student.getStudentNumber() + " | " +  
 student.getName() + "\t| " + student.getGender() + "\t| " +  
 student.getGrade());  
 }  
 } else {  
 System.*out*.println("No students found" + grade);  
 }  
 }  
}

Output:

