Ex.1 //here example is 1 but we write code in 3 different java files.

```
package A5GreedyAlgorithm;
//Note: This Greedy Algorithm questions from "E-Learning Education" You-tube channel
public class A1ActivitySelectionProblem {
	private String  name;
	private int startTime;
	private int finishTime;

	public A1ActivitySelectionProblem(String name, int startTime, int finishTime)
{  //constructor of class
	   this.name=name;
	   this.startTime=startTime;
	   this.finishTime= finishTime;
	}

	//As name, startTime and finishTime are private so we use getter setter
methods
	public String getName() {
		return name;
	}

	public void setName(String name) {
		this.name = name;
	}

	public int getStartTime() {
		return startTime;
	}

	public void setStartTime(int startTime) {
		this.startTime = startTime;
	}

	public int getFinishTime() {
		return finishTime;
	}

	public void setFinishTime(int finishTime) {
		this.finishTime = finishTime;
	}

	@Override
	public String toString() {
		return "Activity: " +name+ ", startime= " +startTime+ ", finishTime=
"+finishTime;
	}



}
```

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```
package A5GreedyAlgorithm;

import java.util.ArrayList;

import java.util.Collections;

import java.util.Comparator;   //Need to import

public class A2ActivitySolution {


	//time complexity: O(nlogn) and space complexity:O(1);

	static void activitySelection(ArrayList<A1ActivitySelectionProblem> ActivityList) {

		Comparator<A1ActivitySelectionProblem> finishTimeComparator = new
Comparator<A1ActivitySelectionProblem>() {

			@Override

			public int compare(A1ActivitySelectionProblem o1, A1ActivitySelectionProblem
o2) {

				return o1.getFinishTime() - o2.getFinishTime();

			}


		};

		Collections.sort(ActivityList,finishTimeComparator);

		A1ActivitySelectionProblem previousActivity= ActivityList.get(0);


		System.out.println("\n\nRecommended Schedule: \n"+ActivityList.get(0));


		for(int i=1; i<ActivityList.size();i++) {

			if(ActivityList.get(i).getStartTime() >= previousActivity.getFinishTime()) {

				System.out.println(" "+ActivityList.get(i));
```

```
                        previousActivity=ActivityList.get(i);
                    }
                }
            }


            /*output:
             *  Recommended Schedule:
           Activity: A3, startime= 1, finishTime= 2
           Activity: A2, startime= 3, finishTime= 4
           Activity: A5, startime= 5, finishTime= 7
           Activity: A6, startime= 8, finishTime= 9
             */


}
```

```
package A5GreedyAlgorithm;
import java.util.ArrayList;
 class A3Main {

      public static void main(String[] args) {
            //here we create custom class that is A1ActivitySelectionProblem
            ArrayList<A1ActivitySelectionProblem> activitylist = new
ArrayList<A1ActivitySelectionProblem>();
            activitylist.add(new A1ActivitySelectionProblem("A1",0,6));
            activitylist.add(new A1ActivitySelectionProblem("A2",3,4));
            activitylist.add(new A1ActivitySelectionProblem("A3",1,2));
            activitylist.add(new A1ActivitySelectionProblem("A4",5,8));
            activitylist.add(new A1ActivitySelectionProblem("A5",5,7));
            activitylist.add(new A1ActivitySelectionProblem("A6",8,9));

            A2ActivitySolution.activitySelection(activitylist);
      }
}
```

Ex.2

```
package A5GreedyAlgorithm;
//Que. Coin change problem
//time complexity: O(nlogn)
import java.util.Arrays;
public class A4CoinChangeProblem {

	static void coinChangeProblem(int[] coins, int amount) {
		Arrays.sort(coins);  //time complexity: O(nlogn) due to sort the array
		int index=coins.length-1;
		while(true) {
			int coinValue= coins[index];
			index--;
			int maxAmount= (amount/coinValue)*coinValue;
			if(maxAmount>0) {
				System.out.println("Coin Value: "+coinValue+" taken
count: "+(amount/coinValue));
				amount= amount-maxAmount;
			}
			if(amount==0) {
				break;
			}
		}
	}

	public static void main(String[] args) {
		int[] coins= {1,2,5,10,20,50,100,1000};
		int amount=2035;
		coinChangeProblem(coins,amount);
	}
 /*
  * output: Coin Value: 1000 taken count: 2
		Coin Value: 20 taken count: 1
		Coin Value: 10 taken count: 1
		Coin Value: 5 taken count: 1
  */
}
```

Ex.3 //here example is one but we write code in 2 different files

```
//package A5GreedyAlgorithm;
//
//public class A5KnapSackItem {
//	private int index;
//	private int value;
//	private int weight;
//	private double ratio;
//
//	public A5KnapSackItem(int index,int value,int weight) {
//	 this.index=index;
//	 this.value=value;
//	 this.weight=weight;
//	 this.ratio= (value*1.0)/weight;
```

```
//      }
//
//      public int getIndex() {
//       return index;
//      }
//
//      public void setIndex(int index) {
//       this.index=index;
//      }
//
//      public int getValue() {
//       return value;
//      }
//
//      public void setValue(int value) {
//       this.value=value;
//      }
//
//      public int getWeight() {
//       return weight;
//      }
//
//      public void setWeight(int weight) {
//       this.weight=weight;
//      }
//
//      public double getRatio() {
//       return ratio;
//      }
//
//      public void setRatio(double ratio) {
//       this.ratio=ratio;
//      }
//
//      @Override
//      public String toString() {
//       return "Item index: "+index+", value: "+value+", weight: "+weight+", ratio:
"+ratio;
//      }
//}



//package A5GreedyAlgorithm;
//import java.util.*;
//public class A6FractionalKnapsack {
//
//    static void knapSack(ArrayList<A5KnapSackItem> items, int capacity) {
//          Comparator<A5KnapSackItem> comparator = new Comparator<A5KnapSackItem>()
{
//                @Override
//                public int compare(A5KnapSackItem a1, A5KnapSackItem a2) {
//                if( a1.getRatio()<a2.getRatio()) {
//                            return 1;
```

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```
//                        }
//                  return -1;
//                  }
//            };
//
//            Collections.sort(items,comparator);
//            int usedCapcity=0;
//            double totalValue=0.0;
//
//            for(A5KnapSackItem item:items) {
//                  if(item.getWeight()+usedCapcity<=capacity) {
//                        totalValue+=item.getValue();
//                        usedCapcity+=item.getWeight();
//                        System.out.println("Taken Item "+item);
//                  }else {
//                        int usedWeight = capacity-usedCapcity;
//                        double value = item.getRatio()*usedWeight;
//                        totalValue+=value;
//                        usedCapcity +=usedWeight;
//                        System.out.println("Item index: "+item.getIndex()+
"Obtained value: "+value+ " used weight: "+usedWeight+" ratio: "+item.getRatio());
//                  }
//                  if(usedCapcity==capacity) {
//                        break;
//                  }
//            }
//            System.out.println("Total Value: "+totalValue);
//      }
//
//      public static void main(String[] args) {
//            ArrayList<A5KnapSackItem> items=new  ArrayList<A5KnapSackItem>();
//            int[] value= {100,120,60};
//            int[] weight= {20,30,10};
//
//      }
//
//}
```