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//Student Class
public class Student{//open class

	//define name, id, and results instance variables
	private String name;
	private long id;
	private int[] results;

	//Constructor which sets instance variables to unassigned or
similar
	public Student(){//open constructor
		name = "Unassigned";
		id = 0;
		int[] results = new int[5];
		//For loop navigates array setting each element to 0
		for(int i=0;i<5;i++){//open for loop
			results[i] = 0;
		}//close for loop
	}//close constructor

	//Overload constructor which sets instance variables to defined
inputs
	public Student(String Name, long ID, int[] Results){//open
overload constructor
		this.name = Name;
		this.id = ID;
		this.setResult(Results);
	}//close overload constructor

	//Getter Methods

	public String getName(){//open Name getter
		return this.name;
	}//close Name getter
	public long getId(){//open ID getter
		return this.id;
	}//close ID getter
	public int getResult(int position){//open Results getter
		return this.results[position];
	}//close Results getter

	//Setter Methods

	public void setName(String Name){//open Name setter
		this.name = Name;
	}//close Name setter
	public void setId(long ID){//open ID setter
		this.id = ID;
	}//close ID setter
```

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	public void setResult(int[] result){//open Results setter
		this.results = result;
	}//close Results setter

	//Results Calculation method
	public String CalculateResult(){//open method
		//initialise running total variable to 0
		int total = 0;
		//Use for loop to calculate total
		for(int j=0;j<5;j++){//open for loop
			total = total + this.getResult(j);
		}//close for loop
		//calculate average
		float average = (total/5);
		System.out.println(average);
		//Pass originally defined to be 40% or higher
		if(average<40){//open if condition
			return "Fail.";
		}else{//close if, open else condition
			return "Pass.";
		}//close elsecondition
	}//close method
}//close class


//Undergraduate class
public class Undergraduate extends Student{//open subclass

	//Constructor for Undergraduate object
	public Undergraduate(){//open constructor
		//call constructor of superclass
		super();
	}//close constructor

	//Overload Constructor
	public Undergraduate(String Name, long ID, int[] Results){//open
Overload Constructor
		//set instance variables to given values
		this.setName(Name);
		this.setId(ID);
		this.setResult(Results);
	}//close Overload Constructor

	public String CalculateResult(){//open Calculate Results method
		//set running total variable to 0
		int total = 0;
		//use for loop to calculate total result
		for(int j=0;j<5;j++){//open for loop
			total = total + this.getResult(j);
		}//close for loop
		//calculate average result
```

```
            float average = (total/5);
            //Return Pass if average result is 40 or over for
Undergraduate
            if(average<40){//open if condition
                  return "Fail.";
            }else{//close if, open else condition
                  return "Pass.";
            }//close else condition
      }//close method
}//close class


//Postgraduate class
public class Postgraduate extends Student{//open subclass

      //Postgraduate object constructor
      public Postgraduate(){//open constructor
            //call superclass constructor method
            super();
      }//close constructor

      //Postgraduate Overload constructor
      public Postgraduate(String Name, long ID, int[] Results){//open
overload constructor
            //set instance variables to given values
            this.setName(Name);
            this.setId(ID);
            this.setResult(Results);
      }//close overload constructor

      //CalculateResult method
      public String CalculateResult(){//open method
            //initialise running total to 0
            int total = 0;
            //use for loop to calculate total of results
            for(int j=0;j<5;j++){//open for loop
                  total = total + this.getResult(j);
            }//close for loop
            //calculate average result
            float average = (total/5);
            //Return Pass if result is 50 or higher for Postgraduate
            if(average<50){//open if condition
                  return "Fail.";
            }else{//close if, open else condition
                  return "Pass.";
            }//close else condition
      }//close method
}//close class


//StudentTest Class
```

```
public class StudentTest{//open class
     public static void main(String[] args){//open main method
          //create Array of Student objects of length 5
          Student[] students = new Student[5];
          //create 3 integer arrays of length 5 for a set of results
          int[] resulttest1 = new int[5];
          int[] resulttest2 = new int[5];
          int[] resulttest3 = new int[5];

          //Use for loops to populate arrays with different results
to test pass/fail conditions
          for(int i=0;i<5;i++){//open for loop
               //set all results to 40, pass undergrad, fail postgrad
               resulttest1[i] = 40;
          }//close for loop

          for(int j=0;j<5;j++){//open for loop
               //set all results to 50, pass both undergrad and
postgrad
               resulttest2[j] = 50;
          }//close for loop

          for(int k=0;k<5;k++){//open for loop
               //set results to 30, fail for postgrad and undergrad
               resulttest3[k] = (30);
          }//close for loop

          //populate students array with mix of undergrad and
postgrad student objects
          students[0] = new
Undergraduate("Adam",12345678,resulttest1);
          students[1] = new Postgraduate("Bob",12348765,resulttest1);
          students[2] = new
Undergraduate("Charlie",123456,resulttest2);
          students[3] = new
Postgraduate("Darren",123654,resulttest2);
          students[4] = new
Undergraduate("Ellie",123789,resulttest3);

          for(int num=0;num<5;num++){//open for loop
               //for each element in students array, print name, id,
and pass/fail
               System.out.println("Name: "+students[num].getName());
               System.out.println("ID: "+students[num].getId());
               System.out.println(students[num].CalculateResult());
          }//close for loop
     }//close main method
}//close class
```

```
D:\Users\marti\Files\Programming\Java\OOP2\Assignment1>java StudentTest
Name: Adam
ID: 12345678
Pass.
Name: Bob
ID: 12348765
Fail.
Name: Charlie
ID: 123456
Pass.
Name: Darren
ID: 123654
Pass.
Name: Ellie
ID: 123789
Fail.
```