

Credit Name: CSE2140 2nd Language Programming  
Assignment Name: Course Grades Mastery

How has your program changed from planning to coding to now? Please explain?

Created a public class with a private 2 dimensional array.

```
public class GradeBook {  
    private int[][] grades;
```

Created a constructor method with 2 int variables as the parameters to initialize the parameters of the array.

```
//Constructor method  
public GradeBook(int numStudents, int numGrades)  
{  
    grades = new int[numStudents][numGrades];  
}
```

Created a method that will initialize each element in the array. Prompt user to input 5 test scores for each student using a for loop.

```
//Inputs grades for each student  
public void getGrades()  
{  
    Scanner userInput = new Scanner(System.in);  
    System.out.println("Please enter 5 test scores for each student:");  
  
    for(int stu=0; stu < grades.length; stu++)  
    {  
        System.out.println("Student " + (stu + 1) + ":");  
        for(int grd=0; grd < grades[0].length; grd++)  
        {  
            grades[stu][grd] = userInput.nextInt();  
        }  
    }  
}
```

Created a method that will display the grades for each student using a for loop.

```
//Displays students and grades  
public void showGrades()  
{  
    for(int stu=0; stu < grades.length; stu++)  
    {  
        System.out.print("\nStudent " + (stu + 1) + ": ");  
        for(int grd=0; grd < grades[0].length; grd++)  
        {  
            if ((grd + 1) == grades[0].length)  
            {  
                System.out.print(grades[stu][grd]);  
            }  
            else  
            {  
                System.out.print(grades[stu][grd] + ", ");  
            }  
        }  
    }  
    System.out.println();  
}
```

Created a method that will return a double average with an int(which student) as the parameters. Used a for loop to add the grade for each test for that student and divide it by the number of tests.

```
//Student average  
public double stuAvg(int stu)  
{  
    int sum = 0;  
    double avg = 0;
```

In the main method, I declared 2 int variables for the test and student(initializing it as 0) and created a 2 dimensional array with parameters.

```
public static void main(String[] args)  
{  
    // TODO Auto-generated method stub  
    //Declaration area  
    int student, test;  
    int[][] grade = new int[5][12];  
    student = 0;
```

Prepared for user input and to shorten the averages to 2 decimal places.

```
//Prepare for user input and shorten answer to 2 decimal places  
Scanner userInput = new Scanner(System.in);  
DecimalFormat df = new DecimalFormat("#0.00");
```

Created a new object with the 2-D array's column length and row length as the parameters.

```
//New object  
GradeBook grades = new GradeBook(grade[0].length, grade.length);
```

Prompted user to enter test grades for each student using the getGrades() method.

```
//Prompts user to enter grades  
grades.getGrades();
```

Used the showGrades method to display the grades of each student.

```
//Displays grades of each student  
grades.showGrades();
```

Used a while loop that will loop until the break condition; the user entering 0. Prompted the user to enter which student to see the average of and displayed the student's average using the stuAvg() method.

```
//Loop until break condition  
while (true)  
{  
    //Prompt user  
    System.out.print("\nWhich student would you like to see the average of?(Enter 0 to continue)"  
        + "\nStudent: ");  
    student = userInput.nextInt();  
  
    //Displays student average  
    if (student == 0)  
    {  
        break;  
    }  
    else  
    {  
        System.out.println("Their average is " + df.format(grades.stuAvg(student)));  
    }  
}
```

Used a while loop that will loop until the break condition; the user entering 0. Prompted the user to enter which test to see the average of and displayed it using the testAvg() method.

```
//Loop until break condition  
while (true)  
{  
    //Prompt user  
    System.out.print("\nWhich test would you like to see the average of?(Enter 0 to quit)"  
        + "\nTest: ");  
    test = userInput.nextInt();  
  
    //Displays test average
```

```

for(int grd=0; grd < grades[0].length; grd++)
{
    sum += grades[stu -1][grd];
}
avg = (double)sum / grades[0].length;

return avg;
}

```

```

//displays test average
if (test == 0)
{
    break;
}
else
{
    System.out.println("The test average is " + df.format(grades.testAvg(test)));
}
}

```

Created a method that will return a double test average with an int(which test) as the parameters. Used a for loop to add the grade for each test from each student and divide it by the number of students.

```

//Test average
public double testAvg(int grd)
{
    int sum = 0;
    double avg = 0;;
    for (int stu = 0; stu < grades.length; stu++)
    {
        sum += grades[stu][grd -1];
    }
    avg = (double)sum / grades.length;

    return avg;
}

```