Exercise 3.4

```
/*
Saket Bakshi
Period 6
10/11/18
This program creates a class, normally named "student", for a student with a name their quizzes.
*/
public class PracticeExercisesCh3E4
{

	//instance variables
	private String name;
	private double score, averageScore;
	private int quizNumber;
	/** Creates a student class variable with a name and an initial quiz score. Has methods to get the name, add another quiz, get the total points, and get the average score.
	@param name the student's name
	@param score the student's first quiz score
	*/
	public PracticeExercisesCh3E4(String name, double score)
	{
		this.name = name;
		this.score = score;
		this.quizNumber = 1;
		this.averageScore = score;
	}

	/** Returns the student's name
	@return the student's name
	*/
	public String getName()
	{
		return name;
	}

	/** Adds another quiz
	@param score the new quiz score
	*/
	public void addQuiz(int score)
	{
		this.score = this.score + score;
```

```
		this.quizNumber = this.quizNumber + 1;
	}

	/** returns the total score
	@return the total score
	*/
	public double getTotalScore()
	{
		return this.score;
	}

	/** returns the average score
	@return the average score
	*/
	public double getAverageScore()
	{
		this.averageScore = this.score/this.quizNumber;
		return this.averageScore;
	}
}

/*
Saket Bakshi
Period 6
10/11/18
This program tests a class, normally named "student", for a student with a name their quizzes.
*/
public class PracticeExercisesCh3E4Tester
{
	public static void main(String[] args)
	{
		PracticeExercisesCh3E4 saket = new PracticeExercisesCh3E4("Saket", 100);
//makes new student class object

		System.out.println(saket.getName()); //returns object's name
		System.out.println("expected output: Saket");

		saket.addQuiz(90); //adds a quiz score of 90

		System.out.println(saket.getTotalScore()); //returns total points student has
		System.out.println("Expected output: 190");

		System.out.println(saket.getAverageScore()); //returns average quiz score
```

```
            System.out.println("Expected output: 95");
        }
}
```

```
PS C:\Users\saket\JAVA\ChapterAssignments\C3EXBakshiSaket> java PracticeExercisesCh3E4Tester
Saket
expected output: Saket
190.0
Expected output: 190
95.0
Expected output: 95
PS C:\Users\saket\JAVA\ChapterAssignments\C3EXBakshiSaket>
```

Exercise 3.5

```
/*
Saket Bakshi
Period 6
10/11/18
This program makes a SavingsAccount class.
*/
public class PracticeExercisesCh3E5
{

        //instance variables
        private double balance;
        private double interest;

        /** Makes a SavingsAccount variable with a balance of 0 and interest of 0.
        */
        public PracticeExercisesCh3E5()
        {
                this.balance = 0;
                this.interest = 0;
        }

        /** Makes a SavingsAccount variable with a balance and interest rate, in percent.
        Has methods to add interest to the balance.
        @param balance the initial balance of the account
        @param interestRate the interest rate for the account

        */
        public PracticeExercisesCh3E5(double balance, double interestRate)
        {
                this.balance = balance;

                double interesting = interestRate / 100 * balance;
                this.interest = interesting;
```

```
	}

	/** Adds interest to the balance
	*/
	public void addInterest()
	{
		this.balance = this.balance + this.interest;
	}

	/** returns the balance
	@return the balance of the account
	*/
	public double getBalance()
	{
		return this.balance;
	}
}
/*
Saket Bakshi
Period 6
10/11/18
This program tests a SavingsAccount class.
*/
public class PracticeExercisesCh3E5Tester
{
	public static void main(String[] args)
	{
		PracticeExercisesCh3E5 saket = new PracticeExercisesCh3E5(1000,10);
//makes account with 1000 balance and 10% interest

		saket.addInterest(); //adds interest
		System.out.println(saket.getBalance()); //returns balance
		System.out.println("Expected value: 1100"); //expected balance
	}
}
```

```
PS C:\Users\saket\JAVA\ChapterAssignments\C3EXBakshiSaket> java PracticeExercisesCh3E5Tester
1100.0
Expected value: 1100
PS C:\Users\saket\JAVA\ChapterAssignments\C3EXBakshiSaket>
```

Exercise 3.13

```
/*
Saket Bakshi
```

```
Period 6
10/4/18
This program creates a class, normally named "Bug", that moves along a horizontal line.
*/
public class PracticeExercisesCh3E12
{

	private int position;
	private int direction;

	public PracticeExercisesCh3E12()
	{
		position = 0;
		direction = 1;
	}

	/** Defines a Bug class variable with a position.
	Has methods for moving, turning, and getting the position.
		@param initial position
	*/
	public PracticeExercisesCh3E12(int p)
	{
		position = p;
		direction = 1;
	}

	/** Moves bug in one space in its direction.
	*/
	public void move()
	{
		this.position = position + direction;
	}

	/** Turns bug to opposite direction.
	*/
	public void turn()
	{
		this.direction = direction * -1;
	}

	/** Returns bug's position
		@return the position of the bug
	*/
```

```
	public int getPosition()
	{
		return position;
	}
}

/*
Saket Bakshi
Period 6
10/4/18
This program tests the Bug class.
*/
public class PracticeExercisesCh3E12Tester
{
	public static void main(String[] args)
	{
		PracticeExercisesCh3E12 bugsy = new PracticeExercisesCh3E12(5); //creates
new Bug class variable

		bugsy.move();
		bugsy.move(); //moves the bug two space
		System.out.println(bugsy.getPosition()); //should return bug's position
		System.out.println("Expected Position: 7"); //position should be 7

		bugsy.turn(); //testing turn of direction
		bugsy.move();
		bugsy.move();
		bugsy.move();
		bugsy.move(); //moves bug 4 spaces in new direction

		System.out.println(bugsy.getPosition());
		System.out.println("Expected Position: 3"); //new position should be three
	}
}
```

```
PS C:\Users\saket\JAVA\ChapterAssignments\C3EXBakshiSaket> java PracticeExercisesCh3E12Tester
7
Expected Position: 7
3
Expected Position: 3
PS C:\Users\saket\JAVA\ChapterAssignments\C3EXBakshiSaket>
```

Project 3.3

```
/*
Saket Bakshi
10/11/18
Project 3.3
This creates a balloon class for inflating a balloon.
*/
public class Balloon
{
	//instance variables
	private double radius;
	private double volume;

	/** This creates a Balloon class object with a radius. This object has methods
	to get the volume of the spherical balloon and inflate its radius. Each
	balloon starts with radius 0.
	*/
	public Balloon()
	{
		this.radius = 0;
		this.volume = 0;
	}

	/**This inflates the balloon
	@param amount the amount by which the balloon's radius is inflated
	*/
	public void inflate(double amount)
	{
		this.radius = this.radius + amount;
		this.volume = Math.PI * 4 /3 * Math.pow(this.radius, 3);
	}

	/**This returns the balloon's volume.
	@return the balloon's volume
	*/
	public double getVolume()
	{
		return this.volume;
	}
}
/*
Saket Bakshi
10/11/18
```

```
Project 3.3
This tests a balloon class for inflating a balloon.
*/
public class BalloonTester
{
	public static void main(String[] args)
	{
		Balloon red = new Balloon(); //creates a new balloon
		red.inflate(4); //inflates the balloon by radius of 4;
		System.out.println(red.getVolume()); //returns volume of balloon
		System.out.println("Expected volume: 268.083");
	}
}
```