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Exercise – Variables and Arithmetic

Round all answers to two decimal places where applicable.

1. **Write a program that asks for a person's year of birth and outputs their age in the current year. Don't worry about months.**

Test Input	output
Enter birth year: 1902	**You must be 101 years old.**

```
Scanner input = new Scanner (System.in);
                System.out.print("Enter birth year: ");
                int year = input.nextInt();
                int age = 2020 - year;
                System.out.println("You must be " + age + " years old");
```

2. **Write a program to calculate the total number of hours someone has watched tv in their life. Prompt the user for their age and the average number of hours of tv they watch per day. Assume they did not watch tv until they were 2 yrs old. Forget about leap years.**

Test Input	Output
Enter Age: 15 **Enter number of tv hours watched per day: 3**	**You've watched approx: 14235 hours in your life**

```
Scanner input = new Scanner (System.in);
                System.out.print("Enter Age: ");
                int age = input.nextInt();
                System.out.print("Enter number of tv hours watched per day: ");
                int hours = input.nextInt();
                int average = ((age-2)*365)*hours;
                System.out.println("You've watched approx: " + average + " hours in your life");
```

3. **Prompt for an object's mass (in kg) and acceleration (in m/s^2), then calculate and print force (in N). (force = mass * acceleration).**

Sample Output
Enter the object's mass in kg **3** **Enter the object's acceleration in m/s**2** **5.3** **The force of the object with a mass of 3 kg and acceleration of 5.3 m/s**2 is 15.9 N.**

```
                Scanner input = new Scanner(System.in);
                System.out.println("Enter the object's mass in kg ");
                double mass = input.nextInt();
                System.out.print("Enter the object's acceleration in m/s**2: ");
                double acceleration = input.nextDouble();
                double force = (mass*acceleration);
                force = Math.round(force*10)/10.0;
                System.out.println("The force of the object with a mass of " + mass + "kg and
acceleration of " + acceleration + "m/s**2 is " + force + "N");
```

4. **Write a program that prompts for the number of hours and outputs the equivalent number of days and hours.**

Sample Output
Enter the total number of hours **300** **There are 12 days and 12 hours in 300 hours**

```
Scanner input = new Scanner (System.in);
System.out.println("Enter the total number of hours");
int totalHours = input.nextInt();
int days = totalHours/24;
int hours = totalHours-(24*days);
System.out.println("There are " + days + " days and " + hours + " hours in " + totalHours
+ " hours")
```

5. **There are 2.54 cm in one inch. Write a program that will prompt for a measurement in inches and convert and output the measurement in centimeters. Use a constant for the conversion factor.**

Test Input	**output**
Enter desk length in inches: 15	**Desk length = 38.1 cm**

```
Scanner input = new Scanner (System.in);
System.out.println("Enter desk length in inches:");
double inches = input.nextDouble();
double conversionFactor = 2.54;
double centimeters = inches*conversionFactor;
System.out.print("Desk length = " + centimeters);
```

6. **Write a program that will prompt for a temperature in Celsius and convert the temperature from Celsius to Fahrenheit. F = [(9/5)*C]+32.**

Test Input	**Output**
Enter Celsius: 10	**10 degrees celsius = 50 degrees Farenheit.**

```
Scanner input = new Scanner (System.in);
System.out.print("Enter Celsius: ");
double celcius = input.nextDouble();
double fahrenheit = ((9.0/5.0)*celcius)+32;
System.out.print(celcius + " degrees celsius " + "= " + fahrenheit + " degrees Farenheit.");
```

7. **Write a program to figure out the following: Louise runs the first half of a race at n miles per hour. Then she picks up her pace and runs the last half of the race at x miles per hour. Write a program that will prompt the user for *n* and *x* and determine how long does it take her to run k miles?**

Test Input	**Output**
Enter first speed: 10 **Enter second speed: 9.2** **Enter total distance: 72**	**She was running for 7.51 hours.**

```
Scanner input = new Scanner (System.in);
System.out.print("Enter first speed: ");
```

```
double speed1 = input.nextDouble();
System.out.print("Enter second speed: ");
double speed2 = input.nextDouble();
System.out.println("Enter total distance: ");
double distance = input.nextDouble();
double time1 = (distance/2)/speed1;
double time2 = (distance/2)/speed2;
double totalTime = Math.round((time1+time2)*100.0)/100.0;
System.out.print("She was running for " + totalTime + " hours");
```