

More Basics of BASIC

Exercise 13: Multiplication and Division

In BASIC and many other programming languages, the symbol for multiplication is the asterisk (*) while the forward slash (/) is used for division. The example program below shows how both can be used in BASIC code.

```
1  rem converting a fraction to a decimal
2  print "This program will convert a fraction into a decimal and as a percent."
3  print
4  input "Please type the numerator followed by the enter key:",n
5  input "Now please key in the denominator folwled by the enter key:",d
6  print
7  print "Thank You."
8  input "Please press the enter key to continue.",enter
9  decimal=n/d
10 percent=100*decimal
11 print
12 print "Your fraction as a decimal number =";decimal
13 print "And as a percent = ";percent;"%"
14 rem end of program
```

Exercise 14: Exponents

By now, you have seen that computers are very useful tools. One of the initial uses of computers was strictly for calculations. In fact, the term "computer" originally meant someone that would do mathematical computations! An important concept in mathematics are exponents. This program will show you how to code for calculations involving exponents.

```
1  rem calculations involving exponents
2  print "This program will demonstrate the use of exponents."
3  print
4  input "Please enter the base number: ",base
5  input "Please enter the exponent: ",exponent
6  print
7  print "Thank You."
8  input "Please press the enter key to continue.",enter
9  answer=base^exponent
10 print
11 print base;" to the power of ";exponent;" = ";answer
12 rem end of program
```

Assignment #3: Calculating Kinetic Energy

The energy of a moving object is called *kinetic energy*. To calculate kinetic energy, we use the equation

$$E_k = \frac{1}{2}mv^2$$

E_k represents *kinetic energy*, m is the object's *mass*, and v is the object's *velocity*.

Write a program that will calculate the *kinetic energy* of an object after the user enters its mass and velocity. Your program should remind the user what the units are for each value (see the example output below).

```
Calculating Kinetic Energy

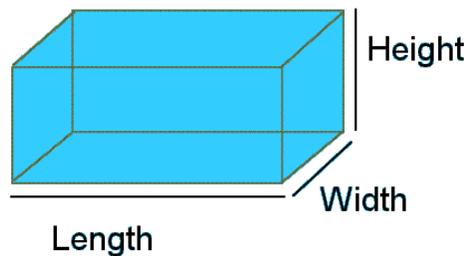
Please enter the object's mass in kilograms: 150
Please enter its velocity (meters per second): 3

Thank You.
Please press the enter key to continue.

The object's kinetic energy = 675.0 Joules
```

Assignment #4: Rectangular Prism

Write a program that will calculate the surface area and volume of a rectangular prism after the user enters the *length*, *width*, and *height*.



Rectangular prism

Assignment #5: Test Scores

For this assignment, a user will enter his/her mark from a test and the maximum test score. Your code will then convert the mark into a percentage. As an option, have the computer assign a letter grade to the score using the guideline below the sample output.

```
Test Score

Please enter your mark: 35
What was the test out of? 40
Thank You. Please press the [Enter] key to continue.

Your test score is 87.5% (A-).
```

A+	100
A	90-99
A-	80-89
B+	77-79
B	74-76
B-	70-73
C+	67-69
C	64-66
C-	60-63
D	Less than 60

Assignment #6: Fibonacci Numbers

The *Fibonacci Sequence* is the series of numbers:

0, 1, 1, 2, 3, 5, 8, 13, 21, 34, ...

The next number in the series is determined by adding the previous two numbers.

Write a program that will list the first 100 *Fibonacci* numbers. Use 15 or less lines of code!!!