C Language Programming: Homework #1

Assigned on 9/20/2016(Tuesday), Due on 9/27/2016(Tuesday)

Description:

1.1

Write a program that computes the volume of a sphere with a 10-meter radius, using

the formula $v = \frac{4}{3}\pi r^3$. Write the fraction 4/3 as 4.0f/3.0f. (Try writing it as 4/3. What

happens?)

  Hint : C doesn't have an exponentiation operator , so you will need to multiple r by itself twice to compute r^3.

1.2

Write a program that asks the user to enter a value for x and then displays the value of the following polynomial : $3x^5 + 2x^4 - 5x^3 - x^2 + 7x - 6$
Hint : C doesn't have an exponentiation operator , so you will need to multiple x by itself repeatedly in order to compute the powers of x. (For example $x * x * x$ is x cubed.And x is an integer.)

1.3

Modify the program of 1.2 so that the polynomial is evaluated using the following

formula : $\left(\left(\left((3x + 2)x - 5\right)x - 1\right)x + 7\right)x - 6$

Note that the modified program performs fewer multiplications. This technique for evaluating polynomials is known as Horner's Rule.

1.4

Write a program that asks the user to enter a U.S. dollar amount and then shows how to pay that amount using the smallest number of $20 , $10 , $5 , $1 bills:

    Enter a dollar amount: <u>93</u>
    $20   bills : 4
    $10   bills : 1
    $5   bills : 0
    $1   bills : 3

Command Line:

```
./hw1_1
./hw1_2 x     (x is an input integer , ex: ./hw1.2 10)
./hw1_3 x     (x is an input integer , ex: ./hw1.3 10)
./hw1_4 x     (x is an input integer , ex: ./hw1.4 93)
```

Output:.

1.1: Output an integer or float.

1.2: Output an integer

1.3: Output an integer

1.4: Output ex:
```
$20  bills : 4
$10  bills : 1
$5   bills : 0
$1   bills : 3
```

Score:

hw1.1: 20%
hw1.2: 20%
hw1.3: 20%
hw1.4: 20%
Report: 20%