Computer Programming

Lab6

May 1, 2025

Ex3

- **Problem:** *Integer Power* – **function**

- Write a **function** integerPower(base, exponent) that returns the value of $base^{exponent}$. For example, integerPower(3,4)= 3^4 = $3 \times 3 \times 3 \times 3$. Assume that exponent is a positive, nonzero integer, and base is an integer. Function integerPower should use for to control the calculation. <u>**Do not use any math library functions**</u>.

Ex3

- **Program output**

```
[ohyong@cse ~/cp/Lab6]$ vi ex6_3.c
[ohyong@cse ~/cp/Lab6]$ gcc ex6_3.c -o ex6_3
[ohyong@cse ~/cp/Lab6]$ ./ex6_3
Enter integer base and exponent: 5 3
5 to the power 3 is: 125
[ohyong@cse ~/cp/Lab6]$ ./ex6_3
Enter integer base and exponent: 2 4
2 to the power 4 is: 16
```

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Extra

- Write a program that solves a quadratic equation of the form $ax^2 + bx + c = 0$. <u>Use</u> the sqrt() function.
  - ✓ In C, mathematical functions are defined in the math.h header file , and the GCC compile option -lm is used to link the math library.
  - ✓ Take three inputs: a, b, and c.
  - ✓ Calculate the discriminant $D = b^2 - 4ac$.
  - ✓ If $D > 0$, the equation has two distinct real roots, and the program should compute and print them.
  - ✓ If $D = 0$, the equation has one real root (a double root), and the program should compute and print it.
  - ✓ If $D < 0$, the equation has no real roots, and the program should print a message indicating that.
  - ✓ You can use the formula for the roots of a quadratic equation:
    - ▪ Root 1: $(-b + \sqrt{(b^2 - 4ac)}) / 2a$
    - ▪ Root 2: $(-b - \sqrt{(b^2 - 4ac)}) / 2a$

Extra

- **Program output**

```
[ohyong@cse ~/cp/Lab6]$ vi ex6_extra.c
[ohyong@cse ~/cp/Lab6]$ gcc ex6_extra.c -o ex6_extra -lm
[ohyong@cse ~/cp/Lab6]$ ./ex6_extra
Enter a: 1
Enter b: -3
Enter c: 2
Root 1: 2.00
Root 2: 1.00
[ohyong@cse ~/cp/Lab6]$ ./ex6_extra
Enter a: 1
Enter b: -6
Enter c: 9
Double root: 3.00
[ohyong@cse ~/cp/Lab6]$ ./ex6_extra
Enter a: 1
Enter b: 4
Enter c: 8
No real roots exist.
```

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Submission

- **Submit to server**

Lab #   Class #

At the end of the Lab6, submit your C sources file by typing

~gs1401/bin/submit Lab6_2 ex6_3.c ex6_extra.c   // by Thur 11:50

You may check that you have submitted your source code correctly by typing

~gs1401/bin/submit -check

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