Minsu Jung

Instructor Jinhui Liu

CS&131 8064

12 January 2023

Lab 2

1. The test results you observed in Task 2

|  |  |
| --- | --- |
| Input | Output |
| 10 | 16.090000 |
| 2.4 | 3.861600 |
| 0.056 | 0.090104 |
| 0 | 0.000000 |
| 1.7E5 | 273530.000000 |
| -3 | -4.827000 |

1. Execute the program. Describe the output. What do you think the program is intended to do?
   1. The output of the program is the power of ten. 1 10 100 … 1000000000. The program is intended to print from the 10 to the power of 0 to 9.
2. The program contains a loop structure as was presented last week in the form of a flowchart structure. The loop executes 10 times. Predict the next two lines of output, if the loop were to continue running for a total of 12 times.
   1. If the loop were to continue running for 2 times more and then the output will contains 2 more lines which are the 10 to the power of 10 and 10 to the power of 11 => 10000000000 100000000000
3. Now, change the constant "10" on line 08 to "12". Build the program again, and then execute the program. Does the output match your prediction? Why do you think this is the case?
   1. No. It doesn’t match my prediction. It shows 1410065408 1215752192 because 10 the power of 10 is to large number. In this code, the number of 10 to the power is assigned into the ‘int’ datatype variable. The int data type can store the number of 2 to the power of 32 numbers (4,294,967,296), but if it goes beyond this number, an "overflow" phenomenon occurs, resulting in a value other than what we expected.
4. Change line 05 to declare the variable power as a double instead of an int. Build the program again. Execute the program. What happened?
   1. It still shows different results than expected. Until the power reaches 9, 0 is the output, and 10 and 11 output 536870912 and 402653184.
5. The output of the program was nonsensical. This is due to the mismatch between the data type of power, which is now a double, and the format string of the printf at line 10, which is for a decimal integer. To fix this, replace the format placeholder (conversion specifier) "%d" with "%f".
6. Build the program and execute it again. What happens now?
   1. Now I got the right result. The output shows 10 to power of 0 to 11.
7. Why do you think that the program was able to display the powers of 10 now but did not do so earlier?
   1. Because of the unmatched Format Specifiers. “%d” is for int data type variables, and “%f” is for double type variables.
8. #include <stdio.h>
9. int main(void)
10. {
11. int count;
12. double power;
13. count = 1;
14. power = 1;
15. while (count <= 12)
16. {
17. printf("%f\n", power);
18. count = count + 1;
19. power = power \* 10;
20. }
21. return (0);
22. }
23. Remove line 01 (the #include line) from the program, and build it. What error messages do you see when you are missing the #include for a library header file?
    1. I cannot use printf, and compiler says “syntax error : missing ‘:’ before ‘{‘” and “missing type speicifier =int assumed.”
24. Replace line 01. (This can be easily accomplished by highlighting all of line 01, and using Ctrl-X, called "cut", to remove the line temporarily. After you try to build the program and observe the errors, you can then quickly put the line back by using the Ctrl-V, called "paste".)
25. Remove line 04, build, and then replace. Describe the error messages that you see when you are missing a variable declaration.
    1. Compiler says, “syntax error: missing ‘;’ before ‘}’, syntax error: ‘int’ should be presented by ‘;’’
26. Remove the semicolon from line 07, build the program, observe the error messages, and then replace the semicolon. Describe the error message in the space provided below. Notice that the error message states that a semicolon was expected. This message is a fairly sure sign of a missing semicolon.
    1. Compiler says, “uninitialized local variable ‘count’ used.”
27. Be creative and try it! Think of three other errors that might be made, introduce these errors one at a time, and describe both the error that you created and the error messages that the compiler produced.
28. I removed replace to print from printf line 10 then compiler said, “’print’: identifier not found”
29. I removed ) from line 08. Compiler said, “syntax error: missing ‘;’ before ‘}’”
30. I removed the = operator from line 06 then the compiler said, “syntax error: missing ‘;’ before constant.”

Lab 2 – 1 Source Code

/\* Minsu Jung \*/

/\* 11 Jan 2023\*/

/\* CS& 131 – Jinhui Liu \*/

#include <stdio.h>

int main(void)

{

int days;

days = 8;

printf("Hello world!\n");

printf("I have been studying programming for %d days!\n", days);

return (0);

}

Lab 2 – 2 Source Code

/\* Minsu Jung \*/

/\* 11 Jan 2023\*/

/\* CS& 131 – Jinhui Liu \*/

#include <stdio.h>

int main(void)

{

double dist\_in\_miles, dist\_in\_kms;

printf("Convert miles to kilometers\n");

printf("Please enter the distance in miles: ");

scanf("%lf", &dist\_in\_miles);

dist\_in\_kms = 1.609 \* dist\_in\_miles;

printf("The distance in kilometers is: ");

printf("%f", dist\_in\_kms);

return (0);

}

Lab 2 – 3 Source Code

/\* Minsu Jung \*/

/\* 11 Jan 2023\*/

/\* CS& 131 – Jinhui Liu \*/

#include <stdio.h>

int main(void)

{

int count;

int power;

count = 1;

power = 1;

while (count <= 10)

{

printf("%d\n", power);

count = count + 1;

power = power \*10;

}

}