Lab 02 – Syntax, Variable Types, and Output Streams

Write a computer program that does the following:

1. Declare 3 variables named a, b, and c and initialize them to the values 2, 4, and 8.

2. Declare 2 boolean variables p and q. Make p true and q false.

3. Declare 3 double variables d, e, and f. Initialize d to 3.14 and e to 0.123.

4. Divide the variable f by the variable e and store the result in d.

5. Reassign the value of a to be 1 without changing the line where it was first initialized (write a new line that changes the value stored in a).

6. Increment b.

7. Declare a float variable named little. Initialize it with the value 44.

8. Create two long variables m and n. Initialize m to 8 and n to 3. Print out the result of m modulus n and then go to a new line.

9. Create character variables s, t, and u. Store the letter ‘c’ in s, ‘a’ in t, and ‘t’ in u. Print what is stored in s, t, and u, in that order all on the same line with no spaces between each value.

10 Create a string variable named str and store the word “dog” in it. Go to a new line and print out what is stored in str and append the letter s to the output on the same line.

11. Create a constant named PI and initialize it to 3.14.

12. Print the variables p, d, a, b, and little. Label each variable with their variable name from the program. Print each variable and its label on its own line.

13. Add a comment to the top of your program telling other coders who you are and which lab you are working on. Also include the date. Put each item of information on a separate line.

13. Run your program. Upload 3 files to blackboard: your source code, the output of your program, and the answers to the questions from the second part of the lab on the following pages.

```
#include <iostream>
#include <string>

using namespace std;

/*
 * Use this program to answer the questions below. Type the program out and compile it if you need help.
 */
int main()
{
  bool flag = false;

  int radius;
  const double PI = 3.14;
  float sum = 3.0F + 4.22f;
  radius = sum;

  double area = 2 * PI * radius * radius;

  string sentence = "This sentence is false.";
  string construct = "The complex houses married and single soldiers and their families";

  string con1 = "if ";
  string con2 = "and ";
  string con3 = "then ";
  string con4 = "therefore ";

  string prop1 = "all spoons are vegetarian ";
  string prop2 = "all vegetarians are good dancers ";
  string prop3 = "all spoons are good dancers ";
  string prop4 = "some good dancing vegetarians are spoons ";

  unsigned long long h = 60L;
  unsigned long long i = 0xD2;

  unsigned long long j = i % h;

  char c1 = 't';
  char c2 = 'h';
  char c3 = 'e';
  char c4 = '8';
  char c5 = 48;

  int b = 0b1001;
  int oct = 070;
  int count = 0;

  count = count + 1;
  count = count + 1;
  count = count + 1;

  cout << "radius: " << radius << endl;
  cout << "PI: " << PI << endl;
  cout << "area: " << area << endl << endl;

  cout << "\"" << sentence << "\" is " << "false" << endl << endl;
  cout << flag << endl << endl;


  cout << con1 << prop1 << con2 << prop2 << con3 << prop3 << con4 << prop4 << endl << endl;

  cout << "h: " << h << endl;
  cout << "i: " << i << endl;
  cout << "j: " << j << endl;
  cout << endl;

  cout << c1 << c2 << c3  << endl;
  cout << c1 + c2 + c3 << endl;

  cout << endl << "c4: " << c4 << endl;
  cout << "c4 + radius: " << c4 + radius << endl << endl;

  cout << "c5: " << c5 << endl << endl;

  cout << "b: " << b << endl;
  cout << "oct: " << oct << endl;
  cout << "count: " << count << endl;

  return 0;
}
```

1. List all the keywords that occur in this program.

2. List all the identifiers that occur in this program.

3. List all of the operators that occur in this program.

4. List all of the functions that occur in this program.

5. List all of the variables that occur in this program.

6. On what lines are the variables declared?

7. On what lines are the variables initialized?

8. On what lines are semicolons absent, why?

9. What is the value of count after line 49 executes?

10. On what lines does the scope of con1 begin and end?

11. Which variables are boolean?

12. What span of lines is blocked of as a comment?

13. On what line will the preprocessor alter the code before the compiler converts the code into machine language.

14. What is cout?

15. What does the << operator do?

16. What is the return value of main?

17. How many parameters were passed into main?

18. What is the return type of main?

19. What is the difference between int and long?

20. What is the difference between signed and unsigned int?

21. What is the difference between int and double?

22. What is the difference between double and float?

23. Which variable is a constant and what keyword makes it so?

24. What is the difference between the string variable and the char variable?

25. List all of the literals that occur in the program.

26. What does the line using namespace std do?

27. What does the line #include <iostream> do?

28. What are semicolins ; for?

29. What do curly braces do { } ?

30. What does = do?

31. List all of the variable types that occur in this program.

32. What is the output of the program.