**CS 142 Study Guide**

**Instructions:** You should work through each of these questions to test your knowledge of the material that will be tested on Midterm 1. You will not be graded on your completion or correctness on this study guide. Your effort and work on this is completely optional. However, it is highly encouraged that you work through each of these Problems on your own (i.e. without any outside help) so that you can see what you need to study.

**1.** Write a complete and syntactically correct "Hello, World!" program. Remember to include any needed libraries and namespace definitions, and to place the program functionality inside function main(). Try to be as syntactically correct as you can. You should be able to transcribe your code into an IDE and be able to run it.

#include <iostream>

Using namespace std;

Int main () {

Cout << “Hello, World!” << endl;

return 0;

}

**2a.** You can use the acos() math function to get the value of π to the most significant digits supported by the compiler by calling acos(-1.0).  Write the code to declare and initialize a constant double variable to hold the value of π using the acos() function.

#include <iostream>

#include <cmath>

Using namespace std;

Int main () {

Const Double PI\_VALUE = acos(-1.0);

Cout << PI\_VALUE << endl;

Return 0;

}

**2b.** What #include do you need for this?

#include <cmath>

#include <string>

#include <vector>

**3a.** Provide code that accomplishes the following functionality:

   (i) Create two variables of type double, named length and width

   (ii) Prompt the user to provide values for the variables length and width; store the values provided by the user into the appropriate variables

   (iii) Create two more variables, this time of type integer, named intLength and intWidth

   (iv) Copy the value contained in length into the variable intLength. Copy the value contained in width into the variable intWidth.

   (v) Output the product of intLength and intWidth

**3b.** If the user provides 3.7 as the value for length and 2.2 as the value for width, what value will your program output?

**4.** What value will be output by the following code?

    int myNumber = 22;

   cout << myNumber % 7;

**5a.** Declare a string variable userName:

String userName;

**5b.** Assign userName with the value “Jane”:

userName = “Jane”;

**6.** Use the following bit of code to answer the question below.

#include <iostream>

using namespace std;

int main() {

   char   userChar;

   cin  >> userChar;

   cout << userChar << " " << userChar << endl;

   cout << " " << userChar << endl;

   cout << userChar << userChar << userChar << endl;

   return 0;

}

What is the output of the program above with the input “\*”?

1. \* \*

 \*

\*\*\*

1. \*\*\*

 \*

\* \*

1. \* \*
2. \*\*\*

\*\*\*

\*\*\*

**7.** Which of the following are valid variable names in C++

a) i

b) num\_books

c) 3D\_count

d) \_startTime

e) funTime!

f) m\_newJob

e –can’t have exclamation marks

**8.** What is the difference between a signed vs an unsigned integer?

If its unsigned 0 to infinity 🡪 can store twice as large of a positive value

Signed is -infinity to infinity

**9.** Which of these would you appropriately assign as constants?

a. the value of pi

b. the number of pies I ate yesterday

c. the max number of students allowed in a classroom

d. a and c

e. all of the above

**10.** What is the value of someVal after this code is executed?

int someVal = 5;

someVal = 3.7 + 3.6;

a. 5

b. 6

c. 7

d. 7.3

e. 12.3

**11.** What is the maximum value that can be stored in a variable of type integer?

2.5 billion

**12.** What will the following code output? Why?

int myNumber = 5;

int integerResult = myNumber/2;

double doubleResult = static\_cast<double>(myNumber)/2;

cout << integerResult << endl;

cout << doubleResult << endl;

2 and 2.5

**13.** What is the difference (if any) between the following four lines of code?

myNumber = myNumber +1;

myNumber += 1;

myNumber++;

++myNumber;

They all are functionally the same

**14.** Which of the following are valid expressions in C++?

1. myNumber + 5
2. myNumber = myNumber - 7.32
3. myNumber \*= 3
4. 3\*myNumber
5. myNumber /= 4.2
6. ++myNumber
7. myNumber++
8. myNumber\*\*
9. sqrt(myNumber)
10. myNumber
11. //myNumber (its a comment)

**15.** What are the maximum and minimum values that can be stored in each of the following data types?

|  |  |  |
| --- | --- | --- |
| Data Type | Minimum Value | Maximum Value |
| int-32 | 232-1 |  |
| unsigned-32 |  | Infinity |
| long-64 |  |  |
| short-16 |  |  |
| Float-32 |  |  |
| Double-32 |  |  |
| Bool-1 | 0 | 1 |

Look at static casting