Java Module – Lesson 2A – Practice Exercise **Name**_____

Completion
Complete each sentence or statement.

1. The three main data types used in a typical Java program are: _____, _____, and _____.
2. In general, data types that are simple in nature are referred to as p_____, and more complex data types are called o_____.
3. The four main primitive data types are: _____, _____, _____, and _____.
4. The four other less used primitive data types are: _____, _____, _____, and _____.
5. The main object data type used so far is the S_____.
6. Describe the difference between Strings and chars, discussing length and symbols used.
   _____
   _____
   _____
   _____
7. List the five parts of a typical initialization statement
   _____, _____, _____, _____, _____,
8. Rewrite the following initialization statement as two separate statements: a declare and an assignment.

```
int x = 5;
-----------------------------
_____;

_____;
```

9. Rewrite the following initialization statement as two separate statements: a declare and an assignment.

```
double wage = 9.25;
-----------------------------
_____;

_____;
```

Java Module – Lesson 2A – Practice Exercise (cont.)

10. Fill in the blanks below with appropriate data about you.

```
String name = _____________________;

int age = _____________________;

double wage = _____________________;

char initial = _____________________;

boolean smart = _____________________;
```

11. A variable that is permanently assigned inside a program is called a _____ and uses the word _____ to indicate this.

12. The difference between a primitive and an object is that a primitive is a memory location that actually contains a _____, but an object is a memory location that contains the _____ _____ of a value.

13. List the absolute "must" rules for creating valid Java identifiers.

_____

_____

_____

_____

14. List the "good idea" rules for creating valid Java identifiers.

_____

_____

_____

_____

15. List the conventions, or "commonly agreed upon" rules for creating valid Java identifiers.

_____

_____

_____

_____

Java Module – Lesson 2A – Practice Exercise (cont.)

16. For what two word phrase is "bit" an abbreviation? _____ _____

17. When the maximum or minimum value is exceeded by 1 in an outward direction, such as adding 1 to the maximum, or subtracting 1 from the minimum, this causes a computer phenomenon called _____.

18. When 1 is added to the maximum value of a data type, what value is the result of this?

    _____

19. When 1 is subtracted from the minimum value of a data type, what value is the result of this?

    _____

20. In general terms, the word ***transcendental*** refers to concepts, ideas, and beliefs that come to us from beyond our senses, things we cannot see, hear, touch, feel, or taste, but have a "gut feeling" about. Similarly, in mathematics, there are certain numbers that are referred to as "transcendental numbers", in the fact that they are irrational (cannot be expressed as a ratio of discreet values), and highly significant in mathematics. Two well-known examples of these numbers are represented as the Java mathematical constants _____ (the ratio of the circumference of a circle to its diameter) and _____ (the base of the natural logarithms).

True/False

____ 21.
```
final int x = 4;
x = 5;
```

____ 22.
```
char a;
a = 'a';
```

____ 23.
```
first name
```

____ 24.
```
String word = 'hello';
```

____ 25.
```
boolean flag = "true";
```

____ 26.
```
int x = 45;
```

____ 27.
```
5_star
```

____ 28.
```
FLAG
```

____ 29.
```
final char a = 'a';
```

____ 30.
```
main
```

____ 31.
```
myName
```

____ 32.
```
final char a;
a = 'a';
```

____ 33.
```
$cost
```

____ 34.
```
double d;
d = 4.5;
```

Java Module – Lesson 2A – Practice Exercise (cont.)

Matching

Match each value with the correct Java constant.

a. Byte.MIN_VALUE
b. Short.MIN_VALUE
c. Integer.MIN_VALUE
d. Long.MIN_VALUE
e. Byte.MAX_VALUE
f. Short.MAX_VALUE
g. Integer.MAX_VALUE
h. Long.MAX_VALUE

____ 35. -9223372036854775808

____ 36. Long.MAX_VALUE+1

____ 37. -32768

____ 38. -128

____ 39. Short.MAX_VALUE+1

____ 40. Integer.MAX_VALUE+1

____ 41. Integer.MIN_VALUE-1

____ 42. 127

____ 43. Byte.MAX_VALUE+1

____ 44. 2147483647

____ 45. Long.MIN_VALUE-1

____ 46. 9223372036854775807

____ 47. 32767

____ 48. Byte.MIN_VALUE-1

____ 49. -2147483648

____ 50. Short.MIN_VALUE-1

Java Module – Lesson 2A – Practice Exercise (cont.)

Match each data type with the number of memory storage bits required.

a. 4
b. 8
c. 16
d. 32
e. 64
f. 128
g. 256

____ 51. long
____ 52. int
____ 53. short
____ 54. byte
____ 55. char
____ 56. double
____ 57. float

Match each abbreviation with the correct memory designation.

a. b
b. B
c. KB
d. MB
e. GB
f. TB
g. PB
h. EB
i. ZB
j. YB

____ 58. byte
____ 59. gigabyte
____ 60. kilobyte
____ 61. bit
____ 62. exabyte
____ 63. zettabyte
____ 64. megabyte
____ 65. terabyte
____ 66. petabyte
____ 67. yottabyte

Match each given range or description to the correct data type.

a. int
b. float
c. double
d. byte
e. short
f. long
g. char

____ 68. -2147483648...2147483647
____ 69. 0...65535
____ 70. -128...127
____ 71. approximately -9 quintillion...9 quintillion
____ 72. -32768...32767
____ 73. up to 15 decimal places of storage and output precision
____ 74. up to 7 decimal places of storage and output precision

Java Module – Lesson 2A – Practice Exercise (cont.)

Match each data value with the most appropriate Java data type.

a. int
b. double
c. char
d. boolean
e. String

____ 75. `"Hello"`
____ 76. `0.28`
____ 77. `'A'`
____ 78. `'9'`
____ 79. `3.4`
____ 80. `65`
____ 81. `100000`
____ 82. `"true"`
____ 83. `false`
____ 84. `"B"`

Java Module – Lesson 2A – Practice Exercise – Key

1.
   int - integers
   double - decimals
   String - words and sentences
2.
   primitives
   objects
3. int, double, char, boolean
4. float, short, byte, long
5. String
6.
   chars are exactly one character and are enclosed in single quotes
   Strings can be zero or more characters long and are enclosed in double quotes.
7. `data type, identifier, = sign, the value, semicolon`
8.
```
int x;
x = 5;
```
9.
```
double wage;
wage = 9.25;
```
10.
```
String name = "John Owen";
int age = 57;
double wage = 54.65;
char initial = 'B';
boolean smart = true;
```
11. A variable that is permanently assigned inside a program is called a constant and uses the word final to indicate this.
12. The difference between a primitive and an object is that a primitive is a memory location that actually contains a **value**, but an object is a memory location that contains the **memory location** of a value.
13.
    No “magic” Java reserved words
    Start with an underscore or a letter, but never a digit
    Use only letters, digits, and underscore, never symbols or spaces
14.
    Use descriptive names for variables
    Avoid single letters for important variables, ok for utility variables like loop control variables
15.
    Multiple words are separated by underscore,
    OR start with lowercase and capitalize any word after that
    Variables always start with lowercase letter
    Contants are always in all caps
    Class identifiers start with capital letters
16. binary digit
17. wraparound
18. The minimum value of that data type.
19. The maximum value of that data type.
20. Math.PI and Math.E

Java Module – Lesson 2A – Practice Exercise – Key (cont.)

TRUE/FALSE

21. F
Once a constant (final) variable has been assigned within a program, it cannot be changed.
22. T
23. F
Invalid - has a space
24. F
25. F
26. T
27. F
Invalid - starts with a digit
28. T
29. T
30. F
Invalid - reserved Java word
31. T
32. T
33. F
Invalid - starts with a symbol
34. T

MATCHING

35. D
36. D
37. B
38. A
39. B
40. C
41. G
42. E
43. A
44. G
45. H
46. H
47. F
48. E
49. C
50. F

51. E
52. D
53. C
54. B
55. C
56. E
57. D
58. B
59. E
60. C
61. A
62. H
63. I
64. D
65. F
66. G
67. J

68. A
69. G
70. D
71. F
72. E
73. C
74. B
75. E
76. B
77. C
78. C
79. B
80. A
81. A
82. E
83. D
84. E