

Final exam topics - Summer 2021

For all topics, the required coverage is limited to those properties, functions, methods and techniques referenced in handouts, posted examples and solutions to practice problems.

- Basic JAVA constructs,
 - o Primitive types vs Class types
 - o operations on primitive types,
 - o expressions.
 - o assignment
- Input and output.
 - o Scanner methods
 - o Formatting data using printf()
- Processing strings. String class and its methods
- Conditional statements – if, if-else
 - o boolean expressions and boolean operators
- Programming with loops
 - o Counting loops and conditional loops
 - o for-loop
 - o while-loop
 - o nested loops
- File input and output
 - o File, PrintWriter, FileWriter
 - o Scanner class
- Defining static methods
 - o Method parameters and return value
 - o Calling static methods
- Defining classes:
 - o Instance variables
 - o Instance methods
 - o Constructors, instantiation

Online Exam Instructions updated for the Final exam

- The exam will take 15 minutes. It is an open-book and open-notes test – you may make use of any documentation available to you. You must sign up by picking a time slot in the emailed spreadsheet (to be sent soon).
- **Recording the session and/or sharing the content of your exam problem set in any way are strictly prohibited.** Failure to adhere to these rules will be penalized severely.
- At the time when you connect to your assigned Zoom session you must have:
 - o A computer with the following applications **open and running**:
 - Zoom (with **VIDEO ON** and **with no virtual background**)
 - Eclipse or any other Java development environment that you are using, **with a new project and an open empty Java file with a main method, where you will be writing your code for the exam.**
 - o Your computer must also have an application that displays a pdf file for opening your exam problem set.
 - o Pen and paper - be prepared to show your written work, just in case.
- After a greeting, I will run a random number generator to pick your exam problem set number, open and **transfer** your Exam Problem Set File (pdf) with the problems/questions **via Zoom Chat**.
- **At that point I will also ask you to share your screen. You will be sharing your screen the rest of the time.**
- As soon as you open your Exam Problem Set File (pdf) I will start the timer.
- You don't need to add comments to your code, but must otherwise use good programming style.
- You can take some time to think about the question, create, run and debug your code before you present your answer, or you can think out loud. There will be a limit on how much time you will be given for each problem.

At the 'check time' you can ask a question, or I might provide some guidance or ask a question.

You will be graded on the correctness, completeness of your answer, also considering the amount of help you receive from me.

If you have any questions or concerns, please make sure to address those with me during office hours preceding the exam.

Final Exam Problem Set (sample)

1. (~3 min) What will be printed? Show your answer in a text editor or on paper. Show your work for partial credit.

```
int a = 35;
int b = 100;
boolean flag = false;

if ( !flag || a > b )
    System.out.println ("One");
else
    System.out.println ("Two");
```

2. (~ 10 min) Define method main that lets the user enter student names in a loop. Stop looping
 1. when the user enters word "stop" in any combination of upper or lower case letters, or
 2. after 10 names are entered.

Each name will be entered in format "Firstname Lastname" , e.g. **Donna Spinelli**.

In the end, print out a total count of names that were entered.

Problem 1 examples:

Please note, if you see an error in code – that is not intentional, it is a typo. These problems are not intended to have any errors in code.

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```
int length = 9;
int pieces = 2;
String str = "Go-Red-Sox";

if (length/pieces == 4){
    System.out.println (str.substring (1, 4));
}
else{
    System.out.println (str.length());
}
```

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```
int costOfPurchase = 75;
double shippingCost = 0;
if (costOfPurchase <= 20) {
    shippingCost = 5.99;
} else if (costOfPurchase > 20 && costOfPurchase <= 65) {
    shippingCost = 10.99;
} else {
    shippingCost = 15.99;
}
System.out.println(shippingCost);
```

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```
int p = 30;
int b = 55;

if (b > p || b < 0 ) {
    b = b / 25;
}
else {
    b = b % 2;
}
System.out.println(b);
```

Problem 2 examples:

- Define static method **sumMethod()** that has no input parameters and that will calculate the sum of all multiples of 3 between 200 and 250. The method should return the calculated sum. Test the method by calling it in main and outputting the returned value.
- Define and test method **main()** that lets the user enter words in a loop. Stop looping when the alphabetical order is violated. Output number of words entered. For example, for input

Apple
banana
Bread
air

output should be 3.

- Define static method **aMethod()** that is passed a String containing a sentence with at least 3 words, which has no punctuation except for the final period. The method must return a new sentence, in which the first and last words will be switched. For example, if passed
"There is a picture on the wall." it should return
"Wall is a picture on the there."
- For the following class definition

```
public class Seat {  
    private char row;    // character denoting the row  
    private int seatNumber; // seat number in the specified row  
}
```

Define a **constructor**, which takes two parameters:

- a character representing the row, and
- an integer representing the seat number in that row.

Constructor should assign the row and **seatNumber** instance variables to parameters, if parameter denoting the seat number is in the range of 1..60, inclusively.

Otherwise, the **seatNumber** instance variable should be assigned value 1.