Computer Science 235
Test 1. Fundamentals of Programming.

General Concepts

- Programming by contract
- Flow of control
- Scope
- Encapsulation
- Abstraction
- Recursion

Language concepts

- Variable
- Literal
- Reserved word
- Type
- Expression
- Statement
- Identifier
- Declaration
- Assignment
- Initialization
- Operator
- Operand
- Array
- Method
- Class

Operations

- Integer division
- Modulus
- Type cast (explicit and automatic)
- Concatenation

Types

- `int`
- `double`
- `boolean`
- `char`
- `String`
- Array types

Statements

- Expression statement
- Declaration (statement)
- Branch (or conditional) statement
- Empty statement
- Block (statement)
- Switch statement
- While statement
- For statement
- Do/while statement
- Return statement
- Break statement

Loops

- Body
- Header
- Single-trip/post-test loop
- zero-trip/pre-test loop
- Test-in-the-middle loop
- Iteration
- Infinite loop

Methods

- Invocation (call)
- Signature
- Parameter (formal and actual)
- Return
- Return type
- Overloading

Kinds of variables

- Local variables
- (Formal) parameters
- Static variables

Recursion

- Base case
- Recursive case
- Mutual recursion
- Infinite recursion

Make sure you also know how to make a new array, for example

```
int[] a = new int[10];
```

Along the same lines, make sure you understand the difference among *declaration*, *assignment*, *initialization*, and *array creation*:

- You declare a *variable*.

- You assign a *value* to a variable.

- You initialize a *variable*.

- You create an *array*.

Know the `String` methods `equals()`, `charAt()`, `toCharArray()`, and `substring()`. A question might require to use one of the other `String` methods, but in that case, I will give you an explanation of the method as a reference.

Understand the difference between methods that work on an array in place (and would typically have a void return type) and methods that create and return a new array.

Expect a vocabulary section, a type analysis question, and several questions asking you to write small pieces of code (most likely methods). The vocabulary section will mostly have questions in the form of "Given an example of a..." There might also be fill-in-the-blank questions.