1. What is the Jasmin-representation type of the following function?

**float[] foo(int a, float[] b)**

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the Jasmin-representation type of the above function is **(I[F)[F**

*foo is the function so its type has format (<input types>)<output type>*

*<input type> of foo is int and float[] so Jasmin-representation type is I[F where I is int and [F is float[]*

*<output type> is float[] so Jasmin-representation type is [F*

2. Let an instance method be declared as follows:

**void foo(int a, float b) {**

**double c;**

**if (...) {int d; ...} else {int e;...}**

**}**

The index of parameter a in the local variable array is **1**

The index of parameter b in the local variable array is **2**

The index of variable c in the local variable array is **3**

The index of variable d in the local variable array is **5**

The index of variable e in the local variable array is **5**

3. Let a be an int variable whose index is 1. What is the Jasmin code of expression a + 1?

The first instruction is **iload\_1** (load integer a)

The second instruction is **iconst\_1** (load constant 1)

The last instruction is **iadd** (add a with 1)

4. Let b be a float variable whose index is 2. What is the Jasmin code of the expression 3.0f \* b ?

The first instruction is **ldc 3.0** (load const 3.0)

The second instruction is **fload\_2** (load float b)

The third instruction is **fmul** (multiply floats)

5. Let a and b be declared as an one-dimension arrays of shorts whose index is 2 and 3, respectively. What is the Jasmin code of expression   
**a[10] = b[3] \* 4**  
Answer the following questions by filling in the blanks?

How many Jasmin instructions are there for the above expression? **8**

Just filling in the following blanks for the sequence of Jasmin instructions of the above expression (may have some redundant blanks - just leave them blanks)

**aload\_2** (Load array a (địa chỉ, không phải aload là load array tên a))

**bipush 10** (push 10 vào stack, làm size của array, bipush vì range lớn hơn 0..5, không thể dùng iconst\_10)

**aload\_3** (Load array b)

**iconst\_3** (push 3 vào array b, in range 0..5 nên dùng iconst được)

**iaload** (Load vào a)

**iconst\_4** (Load const 4

**imul** (Nhân 4 với b[3])

**iastore** (Store kết quả)

6. Let a and b be an int variables whose index is 1 and 2, respectively. What is the Jasmin code of the following Java code?

**if (a < 10) then b = 100; else b = 1000;**

How many Jasmin code are there for the above java code? **10**

The Jasmin code (not including .line) of the above java code are (if there are more blanks than the Jasmin code, just leave the last ones blank).

**iload\_1**

**bipush 10**

**if\_icmpge Label0**

**bipush 100**

**istore\_2**

**goto Label1**

**Label0:**

**sipush 1000**

**istore\_2**

**Label1:**

(iload\_1 và bipush 10 để load a và số 10, nhưng so sánh a >= 10 thay vì a < 10, nếu true thì chạy xuống Label0, false thì đọc tiếp các dòng sau và goto Label1 thay vì đi tới Label0)

7. Given the following instance method declaration in java:

**int foo(float a) { int c; if (a < 10.0f) c = 22; else c = 400; return c;}**

What are the Jasmin code (excluding directives .line) of the if statement in the above code?

The Jasmin code of the above if statement are:

**fload\_1**

**ldc 10.0**

**fcmpl**

**ifge Label0**

**bipush 22**

**istore\_2**

**goto Label1**

**sipush 400**

**istore\_2**

**Label1:**

8. Assume that the index of variable x in the followed declaration is 3

**float x[] = new float [100];**

What are the Jasmin code of the above Java fragment code?

The Jasmin code are

**bipush 100**

**newarray float**

**astore\_3**

9. Given the following Java code:

**public class VD {**

**static float x[] = new float[25];**

**...**

What are the Jasmin code of the declaration of field x?

The Jasmin code are

**bipush 25**

**newarray float**

**putstatic VD.a [F**