

## EECS 768 Virtual Machines – Chapter 4

1. What aspects of program behavior are most predictable? Why?
2. Explain the advantages and drawbacks of instrumentation-based and sampling-based mechanisms of collecting profiles.
3. Partition the profiled program flow-graph in Figure 1 into *traces* and *superblocks* (with duplication).

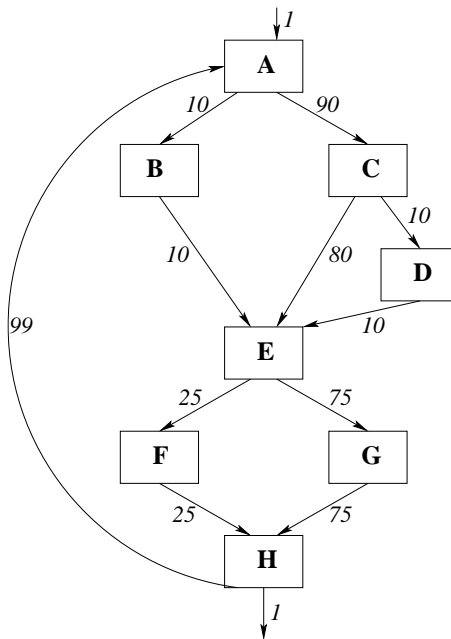


Figure 1: Profiled program control-flow graph

4. Given the below piece of code, perform the following transformations maintaining correctness as well as compatibility:
  - a. Move instruction #3 below the branch in instruction #4.
  - b. Move instruction #7 above the branch in instruction #4.
  - c. Move instruction #3 above instruction #2.
  - d. Move instruction #2 above instruction #1.

```
1.    R3 = R3 + 3
2.    mem(R1) <-- R5
3.    R7 = R2 * 4
4.    Br L2 if R2 == 0
5. L1: R2 = R2 + 1
6.    goto L3
7. L2: R2 = R2 + 2
8. L3: ...
```