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1.) If you are building a processor and have to do static branch prediction (meaning you have to assume at compile time whether a branch is taken or not), how should you do it? You can make a different decision for branches that go forward or backward.

You should first determine whether the branch is going forward or backward. If it is a backward branch then you should assume that it is taken, and if it is a forward branch assume that it is not taken.

2.) If you are building a 256-byte direct-mapped cache, what should you choose as your block (line) size?

You should use a line size of 32 bytes. According to the provided output files for shang, this size provides the lowest number of conflict misses.

3.) What conclusions can you draw about the differences between compiling with no optimization and -O3 optimization?

The performance will usually be increased when compiling with -O3 optimization, but it also usually increases the size of the code.