CLAIM

1. An apparatus configured to decode an image, the apparatus comprising: a processor; and

a memory storing a program which causes the processor to:

extract an intra prediction mode of a current block from a bitstream, the intra prediction mode indicating a particular direction among a plurality of directions, wherein the particular direction is indicated by using one of a dx number in a horizontal direction and a fixed number in a vertical direction, or a dy number in the vertical direction and a fixed number in the horizontal direction, wherein dx and dy are integers;

determine a number of neighboring pixels located on a left side of the current block or an upper side of the current block, configured to determine a location of one or more neighboring pixels among the neighboring pixels located on the left side of the current block or the upper side of the current block using a bitwise shift operation based on a position of a current pixel (j, i) and one of the dx or dy numbers indicating the particular direction, where j and i are integers, and configured to perform intra prediction on the current block using the number of neighboring pixels and the location of the one or more neighboring pixels;

restore the current block by adding the intra-predicted current block and a residual obtained from the bit-stream; and

obtain a value of the current pixel using the number of neighboring pixels, and the location of the one or more neighboring pixels,

wherein:

i) the dx number has a fixed value of 32, and the dy number is determined from among {32, 26, 21, 17, 13, 9, 5, 2, 0, –2, –5, –9, –13, –17, –21, –26}, or

ii) the dy number has a fixed value of 32, and the dx number is determined from among {32, 26, 21, 17, 13, 9, 5, 2, 0, –2, –5, –9, –13, –17, –21, –26},

the location of the one or more neighboring pixels located on the upper side of the current block is determined based on i*dx>>m, where i is a position of the current pixel in the vertical direction, m is related to the fixed number in the vertical direction, and >> is the bitwise shift operation, and

the location of the one or more neighboring pixels located on the left side of the current block is determined based on j*dy>>n, where j is a position of the current pixel in the horizontal direction, and n is related to the fixed number in the horizontal direction, and

wherein the bitwise shift operation operates on a binary representation of i*dx and j*dy.