Why use two’s complement to represent negative numbers?

The reason why we want to use two’s complement to represent negative numbers that we can preform the signed integer arithmetic. Keeping this in binary we should be able to create a proof to show that a positive and negative integer (say 2 for example) are added together. The result would be 0 between -2 and 2. The answer is an overflow so we can ignore the 1 on the left hand most side.

0010 (2) + 1110(-2) = 10000

This can only happen if we apply 2’s complement to the -2 binary number.

(add counter point if we did not take two’s complement)