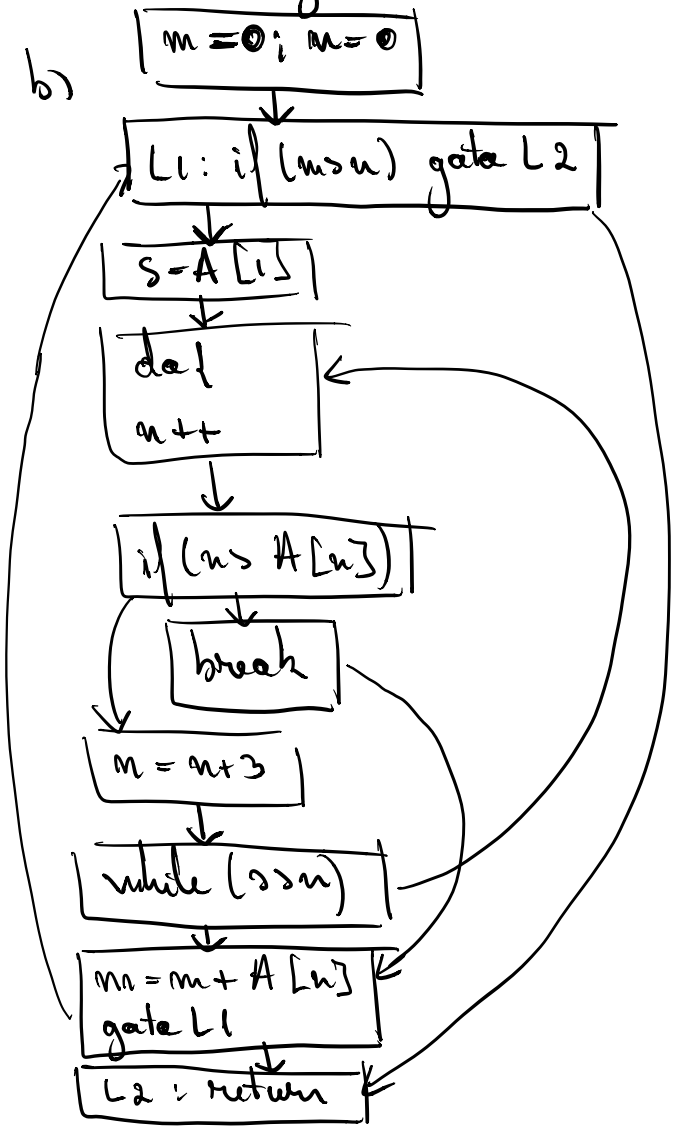
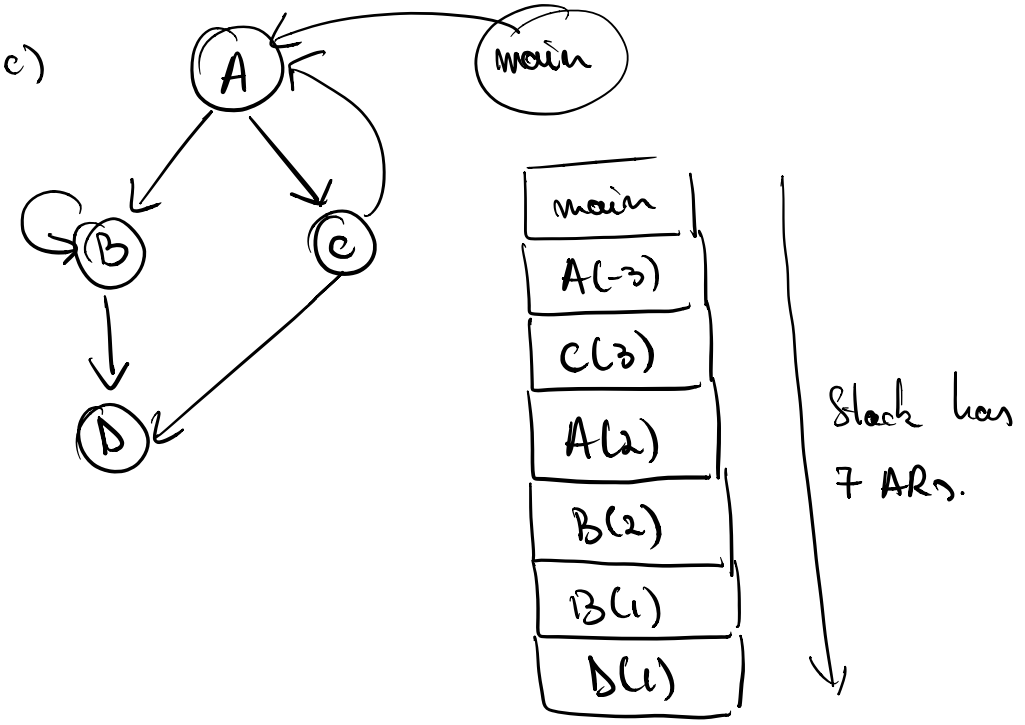
a)

Production	Semantic Rule
$G \to E$	$G.val = E.val$
$E \to E_1 + T$	$E.val = E_1.val + T.val$
$E \to T$	$E.val = T.val$
$T \to T_1 * F$	$T.val = T_1.val * F.val$
$T \to F$	$T.val = F.val$
$F \to (E)$	$F.val = E.val$
$F \to digit$	$F.val = digit$

b)



c)



d) Consider the chunks $a_1, a_2, \ldots, a_m$ and let a_i^j be the j^{th} bit in the i^{th} chunck. Then, the same code is obtained if an even no. of chuncks have their j^{th} bit changed.

Moreover, $n \% 2^{11}$ represent the least significant 11 bits of n, which means that only the first 11 bits of the chunks det. the hash code. So the hash fct is not good.