Problem 1

The real instructions that replace the “call” instruction are:

auipc x6, offset[31:12]:

This instruction fills the temporary x6 register with a pc-relative address.

From the RISC-V Documentation:

AUIPC forms a 32-bit offset from the 20-bit U-immediate, filling in the lowest 12 bits with zeros, adds this offset to the pc, then places the result in register rd [x6]

jalr x1, x6, offset[11:0]

This instruction jumps to a different part of the assembly code.

From the RISC-V Documentation:

The target address is obtained by adding the 12-bit signed I-immediate to the register rs1 [x1], then setting the least-significant bit of the result to zero. The address of the instruction following the jump (pc+4) is written to register rd [x6].