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//The following program adds two numbers and then subtracts it from a third number. If the result is //negative, output the character ‘N’ to an ASCII display, if it’s positive, output a ‘P’, and if it’s 0, output a //‘Z’.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Address | Label | Hex Code | Assembly Instruction | Comment |
| 003 |  | 003 | ORG | Load program at address |
| 003 |  | 2003 | LDA A | Load first operand into AC |
| 004 |  | 1004 | ADD B | Add operand B to operand A in the AC |
| 005 |  | 7200 | CMA | Take complement of AC |
| 006 |  | 7020 | INC | Increment AC to make Two’s Complement of A + B |
| 007 |  | 1007 | ADD C | Add C to Comp(A + B) |
| 008 |  | 7010 | SPA | Skip to code that prints P and executes it. |
| 009 |  | 400D | BUN EIF | Skip to code that prints N and executes it. |
| A |  | 2050 | LDA P | Put P into the AC |
| B |  | F400 | OUT | Print out into ASCII display from Output Reg |
| C |  | 4014 | BUN END | Ensure that P is printed out and the program ends afterwards by branching |
| D | EIF | 7008 | SNA | Check if AC is negative |
| E |  | 4012 | BUN ZER | Branch to ZER |
| F |  |  | LDA N | Put N into AC |
| 10 |  | F400 | OUT | Display output |
| 11 |  | 4014 | BUN END | Branch to the end of the program |
| 012 | ZER |  | LDA Z | Put Z into AC |
| 013 |  |  | OUT | Display output |
| 014 | END |  | HLT | End program |
| 015 | A | 000A | DEC 10 |  |
| 016 | B | 000D | DEC 13 |  |
| 017 | C | FFD3 | DEC -45 |  |
| 018 | P | 0050 | ‘P’ |  |
| 019 | N | 004E | ‘N’ |  |
| 020 | Z | 007A | ‘Z’ |  |