**CSE 232 Systems Programming**

**2023 Fall**

**Assignment 3**

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| **Purpose:** The purpose of this assignment is to practice addressing modes, relative addressing, and subroutines in M6800 assembly language programming. |

1. Convert the following program to machine code **manually**, and fill in the given table. Show how you calculate the offset for branch instructions. Then convert the code using the simulator (SDK 6800) and compare the results.

Show all calculations.

| **Assembly program** | **Addressing mode** | **Machine code** |
| --- | --- | --- |
| LDAA 20H | Direct | 96 20 |
| LDX #100H | Indexed | EE 0100 |
| LOOP: CPX #110H | Indexed | AC 0110 |
| BEQ STORE | Relative | 27 0120 |
| ADDA 0,X | Indexed | AB 0100 |
| INX | Inherent | 08 0101 |
| BRA LOOP | Relative | 20 0111 |
| STORE: STAA 1,X | Indexed | A7 0121 |
|  |  |  |

2. Write a subroutine named **asn** that assigns hexadecimal 32 to an element of array A[] which is pointed by the index register. Then call this subroutine in a loop for each element of A[]. Assume that the array has 5 elements.

subroutine asn() {

A[i]=32H

}

main()

{ …

for each element i of array A[]

{

call asn()

}

}