Testing

1. Add instruction into instruction memory

Purpose: Checks for successful addition of instructions into instruction memory.

Configuration: Include an s-record to place instructions into instruction memory.

```
S0160000454345443334303335F6C6162315F312E61736D50
S11F10000062007801589040026803688945053802581340904089 42F93FFF3F2F
S9031000EC
```

Expected Results: The S1 s-record will be saved starting at memory location 0x1000.

Actual results: The instructions save as expected.

```
1000: 00 62 00 78 01 58 90 40 02 68 03 68 89 45 05 38 .b.x.X.@.h.h.E.8
1010: 02 58 13 40 90 40 89 42 f9 3f ff 3f 00 00 00 00 .X.@.@.B.?.?....
```

2. Add data into data memory

Purpose: Checks for successful addition of data into data memory.

Configuration: Include an s-record to place instructions into instruction memory.

```
S0160000454345443334303335F6C6162315F312E61736D50
S20F00400500010001000100010001000A6
S9031000EC
```

Expected Results: The S2 s-record will be saved starting at memory location 0x40.

Actual results: The instructions save as expected,

```
0040: 05 00 01 00 01 00 01 00 01 00 01 00 00 00 00 00 ................
0050: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 ................
```

3. When length of the record exceeds what is indicated by record

Purpose: Checks for if the loader stops reading records at indicated record length.

Configuration: Add more data bytes than what is expected to the second record.

```
S0160000454345443334303335F6C6162315F312E61736D50
S20F004005000100010001000100010011111111A6
S9031000EC
```

Expected Results: The memory will not save the additional 0x11 data bytes.

Actual results: The instructions save as expected.

```
0040: 05 00 01 00 01 00 01 00 01 00 01 00 00 00 00 00 ................
0050: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 ................
```

4. When length of the record is less than what is indicated by record

Purpose: Checks for how program handles an s-record that is smaller than expected.

Configuration: Removed four data bytes from the second record.

```
S0160000454345443334303335F6C6162315F312E61736D50
S20F0040050001000100A6
S9031000EC
```

Expected Results: The loader will look for the additional bytes from the following records.

Actual results: The counter behaved as expected.

```
0040: 05 00 01 00 01 00 a6 cc 5f 6c 61 62 00 00 00 00 ........_lab....
0050: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 ................
```

5. Identifies no errors with checksum

Purpose: Checks for the loader successfully comparing each record's contents with its checksum.

Configuration: All s-records loaded in are valid.

Expected Results: The loader will print a success statement after xme file is loaded.

Actual results: The loader behaves as expected.

```
Enter .XME file to load
hi.xme
Source filename: ECED3403_lab1_1.asm
File read - no errors detected. Starting address: 1000
Option:
```

6. Identifies errors with checksum

Purpose: Checks for the loader successfully identifying invalid records by comparing its checksum with its contents.

Configuration: An invalid s-record is loaded.

Expected Results: The loader will print a failure statement after xme file is loaded, identifying the invalid record.

Actual results: The loader behaves as expected.

```
Enter .XME file to load
hi.xme
Source filename: ECED3403_lab1_1.asmInvalid checksum: >S9031000EF<
```

7. Name origin file from S0 record.

Purpose: Checks for if the loader can use the S0 record to name the origin file and print to the screen.

Configuration: Include a S0 record in the xme file.

Expected Results: the loader will print the origin file name to the screen.

Actual results: The loader behaves as expected.

```
Enter .XME file to load
hi.xme
Source filename: ECED3403_lab1_1.asm
File read - no errors detected. Starting address: 1000
Option:
```

8. Overwriting memory

Purpose: Checks for if the loader can overwrite memory with newer data/instructions.

Configuration: Have two S1 records with similar memory locations in the xme file.

```
S0160000454345443334303335F6C6162315F312E61736D50
S10F100011111111111111111
S10F100500000000000000000
S9031000EC
```

Expected Results: the loader will overwrite the older record's memory location with the newer record whenever they overlap.

Actual results: The loader behaves as expected.

```
Enter lower and upper bound
1000 1050
1000: 00 62 00 78 01 00 00 00 00 00 00 00 00 00 00 00 .b.x............
1010: 00 00 00 00 00 00 00 00 00 0a 06 cc 42 f9 3f ff ............B.?.
```