

# Assembler User Guide

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## 1 Introduction

This user guide provides instructions on how to compile, execute, and test the assembler. The assembler translates assembly language into machine-readable octal instructions, following the specifications of the instruction set architecture (ISA).

## 2 System Requirements

To run the assembler, ensure the following:

- Java Development Kit (JDK) installed (Version 8 or higher).
- Terminal or command prompt access.
- The provided assembler JAR file or source code.

## 3 Installation and Execution

### 3.1 Compiling from Source Code

If using the raw Java source code, compile it with:

```
javac Assembler.java
```

### 3.2 Running the Assembler

To run the assembler with an assembly source file:

```
java Assembler test.asm
```

Or, if using the JAR file:

```
java -jar Assembler.jar test.asm
```

## 4 Expected Outputs

After execution, the assembler will generate the following output files:

- **listing.txt** - Contains memory addresses, octal instructions, and the corresponding assembly source code lines.
- **load.txt** - Contains memory addresses and their respective octal instructions for machine execution.

## 5 Example Input and Output

### 5.1 Example Assembly Input (test.asm)

```
LOC 10
Data 5
Data 8
LDX 1,11
LDR 2,0,10
ADD 2,3,0
STR 2,0,12
HLT
```

### 5.2 Expected listing.txt Output

```
000010 000005 Data 5
000011 000010 Data 8
000012 102011 LDX 1,11
000013 104010 LDR 2,0,10
000014 204300 ADD 2,3,0
000015 106012 STR 2,0,12
000016 000000 HLT
```

### 5.3 Expected load.txt Output

```
000010 000005
000011 000010
000012 102011
000013 104010
000014 204300
000015 106012
000016 000000
```

## 6 Troubleshooting

- **Errors in output?** Ensure the assembly input follows the ISA specifications.
- **JAR file won't execute?** Verify Java installation with:

```
java -version
```

- **Missing output files?** Ensure write permissions are enabled in the directory.

## 7 Conclusion

This guide provides all necessary steps to use the assembler effectively. Ensure proper input formatting for correct execution.