

# README

Hannah Ivy

February 17, 2019

## ASM Compiler for 4001 and 4003

By [Hannah Ivy contact@hannah.com](mailto:Hannah.Ivy.contact@hannah.com)

This is compiled in to a .pdf using `pandoc ./README.md -o README.pdf`.

The program is run like so:

```
usage: python3 ./asm_4xxx.py [-h] [--verbose] processor filename outfile
```

```
usage: asm_4xxx.py [-h] [--verbose] processor filename outfile
```

positional arguments:

```
processor      Processor: eg 4001, 4003
filename      The file name to convert from
outfile       The file name to convert to
```

optional arguments:

```
-h, --help      show this help message and exit
--verbose, -v   Shows the asm and instruction for each as it goes along.````
```

## Instruction Sets

### 4001

Machine Code	Instruction	Description	Long Description
0	HLT	Halt	Stop the program
1	ADD 1	rax = rax+1	Increase rax by 1
2	ADD 2	rax = rax+2	Increase rax by 2
3	ADD 4	rax = rax+4	Increase rax by 4
4	ADD 8	rax = rax+8	Increase rax by 8
7	PRT	Print rax	Print the contents of rax

### 4003

Machine Code	Instruction	Description
0	HLT	Halt
1	ADD rax, 1	rax = rax+1
2	SUB rax, 1	rax = rax-1
3	ADD rbx, 1	rbx = rbx+1
4	SUB rbx, 1	rbx = rbx-1
5	XCHG rax rbx	Swap rax <-> rbx
6	BEL	Ring Bell
7	PRT	Print rax
8	JNE rax 0 X	Jump to X if rax not 0
9	JE rax 0 X	Jump to X if rax == 0