

# Operating Systems Hands On Guide

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## 1 Installation Guide

Step 1: For Linux goto Step 4 directly.

For windows first install windows susb-system for linux: Open powershell as administrator and type:

**wsl --install**

Step 2: Go to Microsoft store and download Ubuntu.

Step 3: Open ubuntu and create your username and password.

Step 4: Install the tools required for xv6: On ububtu type

**sudo apt-get update**

**sudo apt-get install git build-essential gdb-multiarch qemu-system-misc gcc-riscv64-linux-gnu binutils-riscv64-linux-gnu**

Step 5: Clone the xv6 repository by running:

**git clone https://github.com/mit-pdos/xv6-riscv.git**

Step 6: Step 6: Navigate to xv6 directory:

**cd xv6-riscv**

Step 7: Compile and run xv6: **make qemu**

When running xv6, you can exit the kernel window by pressing Ctrl-a followed by x.

## 2 Making a Program

### Xv6

To create a simple program, first we need to create its file.

Goto the user directory inside Xv6:

```
cd xv6-riscv/user
```

Create new file: **nano Myprog.c**

```
#include "kernel/types.h"
#include "kernel/stat.h"
#include "user/user.h"
```

```
int main(void) {
    printf("Hello _World!\n");
    exit(0);
}
```

Change the directory back to xv6:

```
cd xv6-riscv
```

Open the Makefile of Xv6:

```
nano Makefile
```

Scroll down to the point where you see the User Programs code:

```
UPROGS=\
    $U/_cat\
    $U/_echo\
    $U/_forktest\
```

Add the name of your program here:

```
$U/_hello\
```

Compile the directory by typing:

```
make
```

Run the Xv6 kernel:

```
make qemu
```

type the name of your program:

```
hello
```

The result will look like this:

```
$ hello
Hello , World!
```

**Linux** To create a simple program, first we need to create its file.

Create new file: **nano Myprog.c**

```
#include "stdio.h"
```

```
int main(void) {
    printf("Hello _World!\n");
    return 0;
}
```

Compile the file with the following command:

```
gcc -o hello hello.c
```

Run the file with the following command:

```
./hello
```