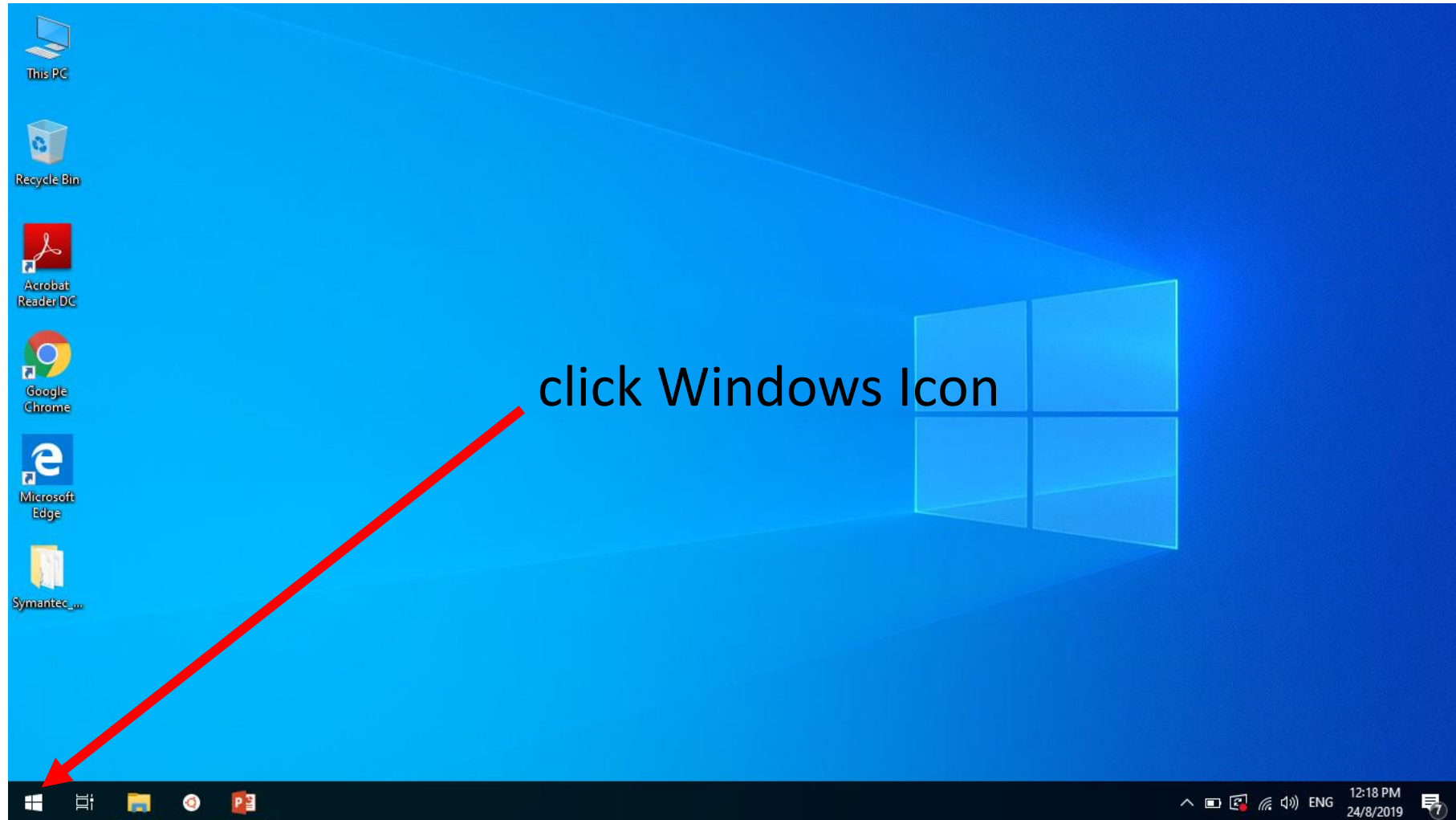


Introduction to Linux

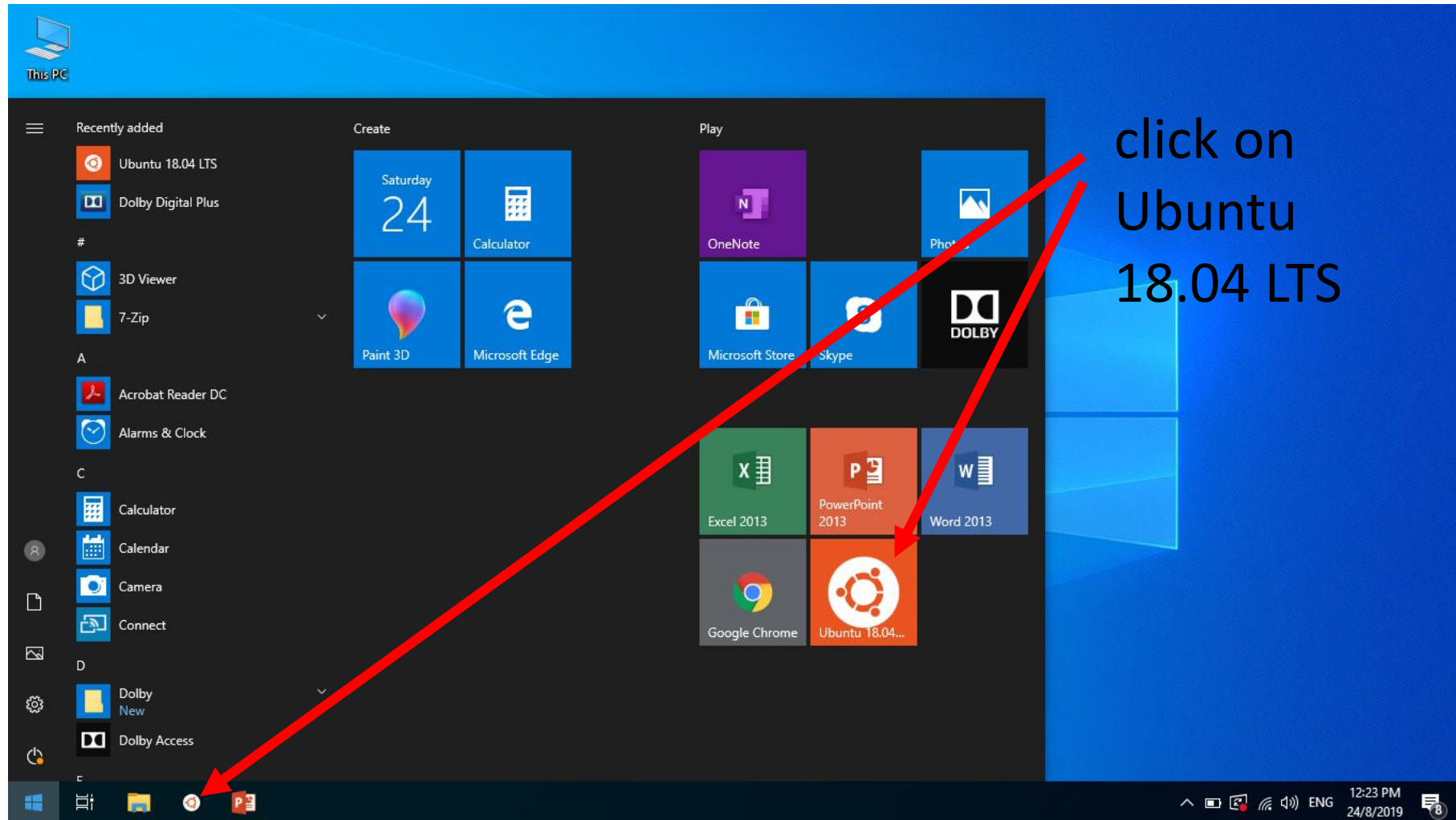
Using Windows Subsystem for Linux (WSL)

Slides prepared by Jhoann Miyajima
BII, A*STAR Singapore

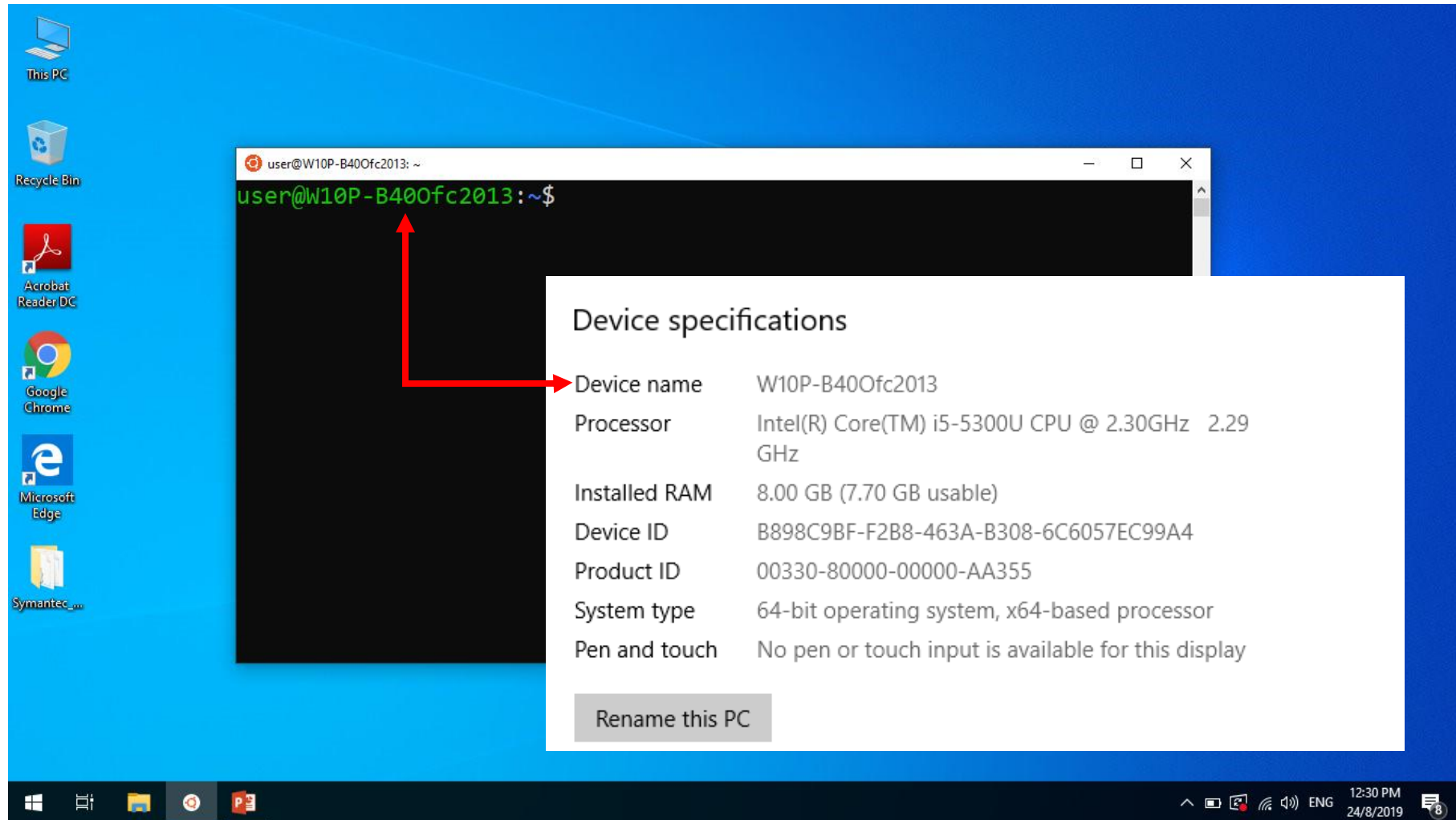
Starting Ubuntu Terminal



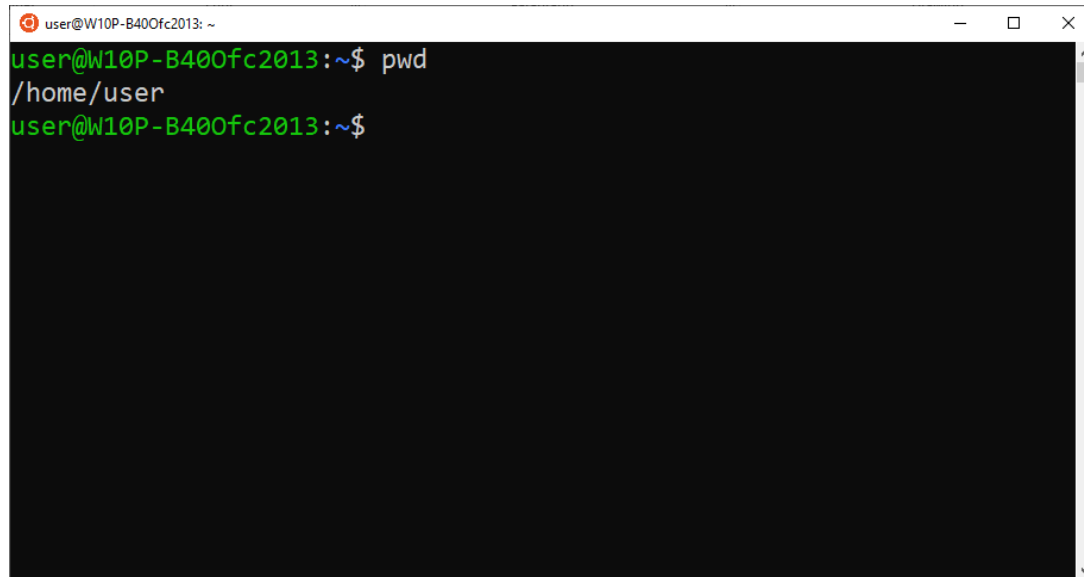
Starting Ubuntu Terminal



Starting Ubuntu Terminal



Getting around Linux system

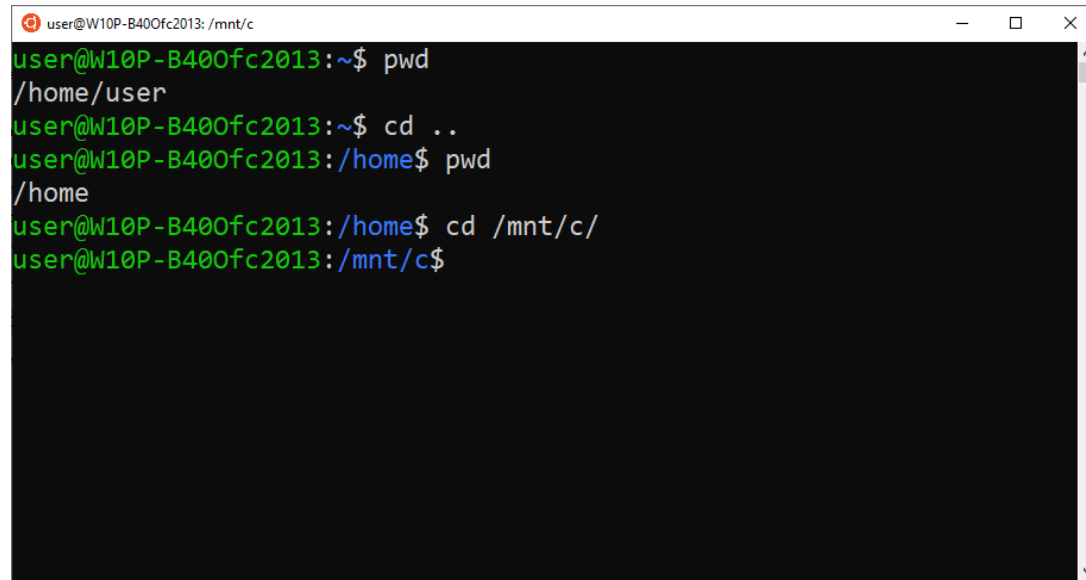
A terminal window with a black background and green text. The window title is "user@W10P-B40Ofc2013: ~". The prompt is "user@W10P-B40Ofc2013:~\$". The command "pwd" has been entered, and the output is "/home/user". The prompt is now "user@W10P-B40Ofc2013:~\$".

```
user@W10P-B40Ofc2013: ~  
user@W10P-B40Ofc2013:~$ pwd  
/home/user  
user@W10P-B40Ofc2013:~$
```

pwd

- **p**rint **w**orking **d**irectory
- to know which directory you are in
- forward slash(/) denotes the base of Linux file system
- user directory is usually like "/home/username"

Getting around Linux system

A terminal window with a black background and green text. The window title is 'user@W10P-B40Ofc2013: /mnt/c'. The terminal shows a sequence of commands and their outputs: 'pwd' returns '/home/user', 'cd ..' returns '/home', 'pwd' returns '/home', and 'cd /mnt/c/' returns '/mnt/c\$'.

```
user@W10P-B40Ofc2013:~$ pwd
/home/user
user@W10P-B40Ofc2013:~$ cd ..
user@W10P-B40Ofc2013:/home$ pwd
/home
user@W10P-B40Ofc2013:/home$ cd /mnt/c/
user@W10P-B40Ofc2013:/mnt/c$
```

cd

- change **directory**

cd ..

- to move one level up to parent directory

cd <specific directory>

- For example:

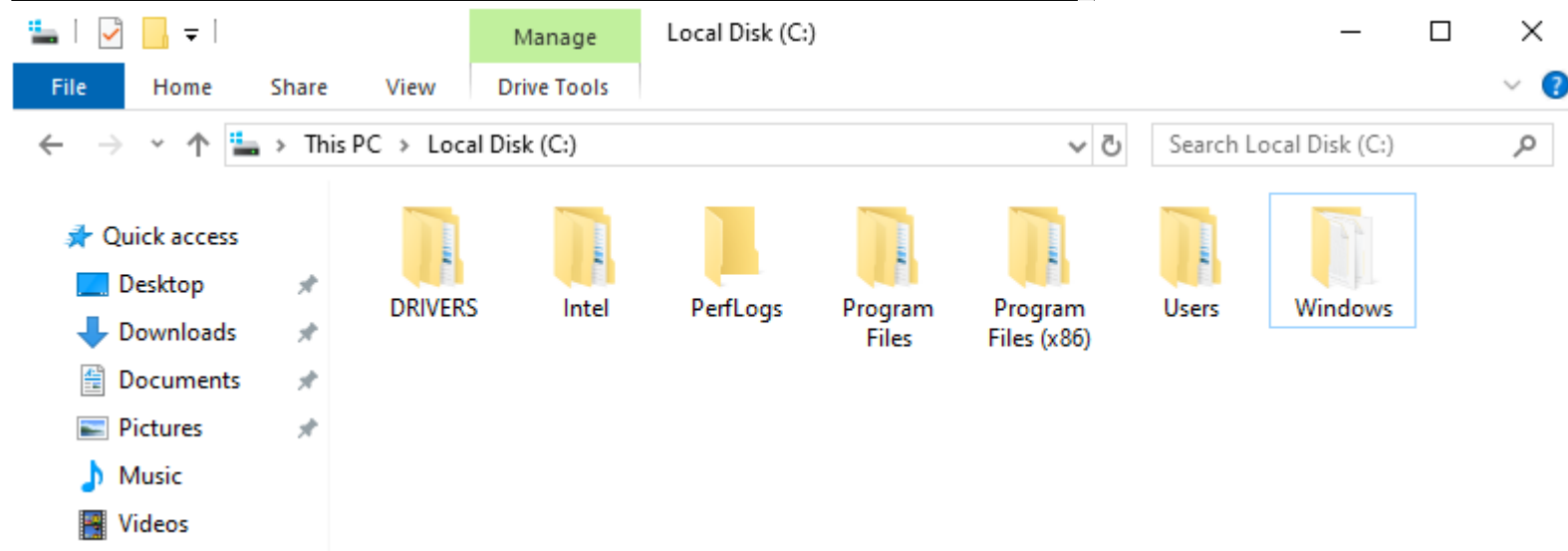
change directory to C:\

Getting around Linux system

```
user@W10P-B400fc2013: /mnt/c$ ls
ls: cannot read symbolic link 'Documents and Settings': Permission denied
ls: cannot access 'hiberfil.sys': Permission denied
ls: cannot access 'pagefile.sys': Permission denied
ls: cannot access 'swapfile.sys': Permission denied
$Recycle.Bin          PerfLogs             Users
Config.Msi            'Program Files'      Windows
DRIVERS              'Program Files (x86)' hiberfil.sys
'Documents and Settings' ProgramData           pagefile.sys
Intel                 Recovery             swapfile.sys
MSOCache              'System Volume Information'
```

ls

print the contents of current directory
(folders/files/programme/etc)



Creating a new folder

```
user@W10P-B400fc2013: /mnt/c/Users/User/Documents
user@W10P-B400fc2013:/mnt/c$ cd Users
user@W10P-B400fc2013:/mnt/c/Users$ cd User
user@W10P-B400fc2013:/mnt/c/Users/User$ cd Documents
user@W10P-B400fc2013:/mnt/c/Users/User/Documents$ ls
ls: cannot read symbolic link 'My Music': Permission denied
ls: cannot read symbolic link 'My Pictures': Permission denied
ls: cannot read symbolic link 'My Videos': Permission denied
Custom Office Templates  'My Music'  'My Pictures'  'My Videos'  desktop.ini
user@W10P-B400fc2013:/mnt/c/Users/User/Documents$
```

```
user@W10P-B400fc2013: /mnt/c/Users/User/Documents
user@W10P-B400fc2013:/mnt/c$ cd Users/User/Documents
user@W10P-B400fc2013:/mnt/c/Users/User/Documents$ ls
ls: cannot read symbolic link 'My Music': Permission denied
ls: cannot read symbolic link 'My Pictures': Permission denied
ls: cannot read symbolic link 'My Videos': Permission denied
Custom Office Templates  'My Music'  'My Pictures'  'My Videos'  desktop.ini
user@W10P-B400fc2013:/mnt/c/Users/User/Documents$
```

First go to “Documents” folder

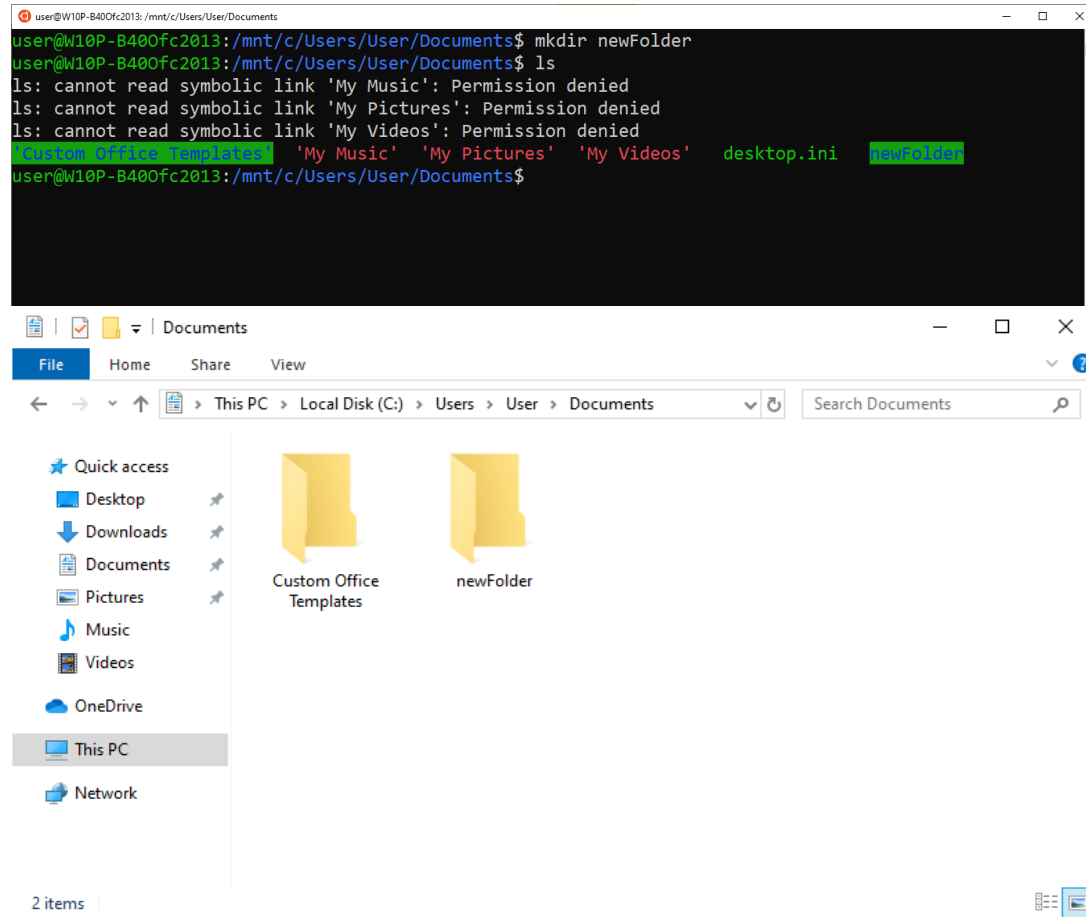
- From current directory: /mnt/c
(the long way)

cd Users -> cd User -> cd Documents

(the short way)

cd Users/User/Documents

Creating a new folder



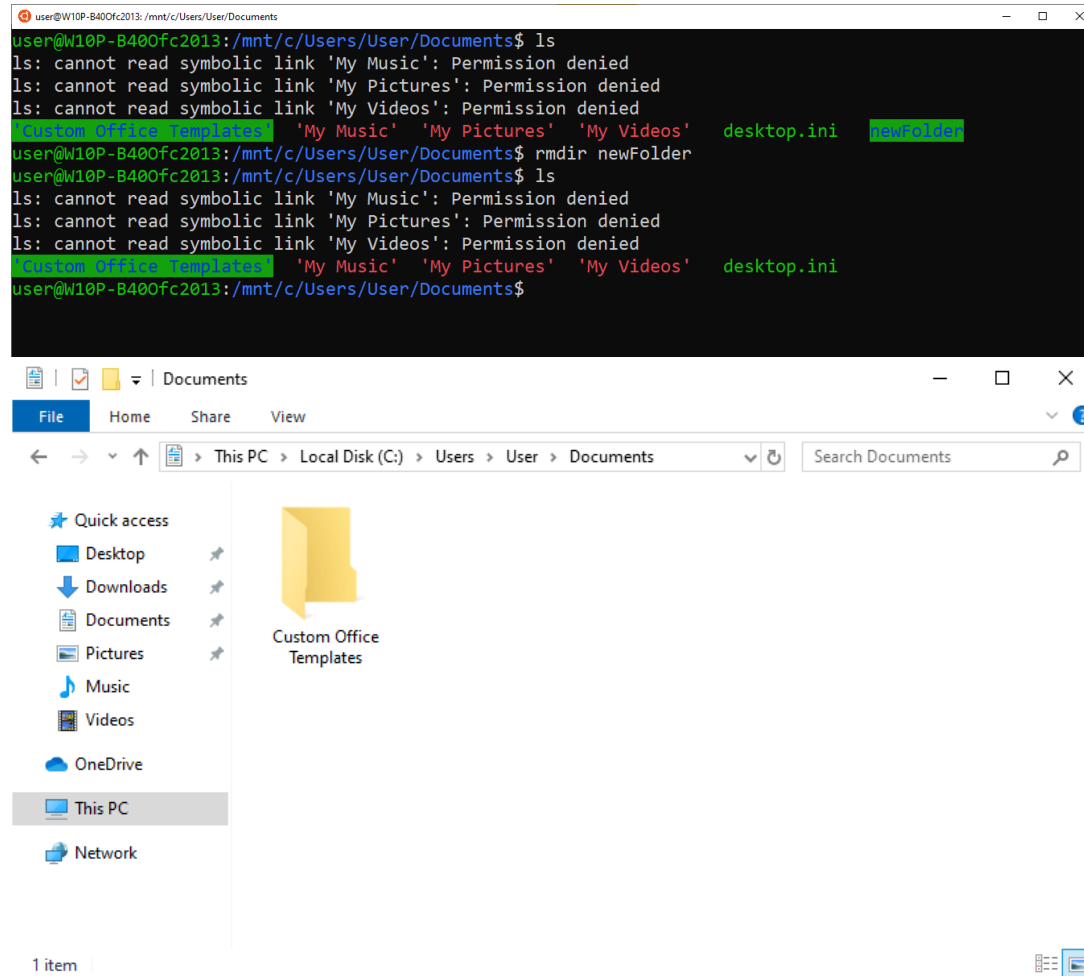
mkdir

- make new directory

mkdir <folder name>

- For example we want to make a new folder and we name it "newFolder" **mkdir newFolder**
- Opening a windows browser, you should see a newly created folder with the name "newFolder"

Deleting a folder



The image shows a terminal window and a Windows File Explorer window. The terminal window displays the following commands and output:

```
user@W10P-B400fc2013:/mnt/c/Users/User/Documents$ ls
ls: cannot read symbolic link 'My Music': Permission denied
ls: cannot read symbolic link 'My Pictures': Permission denied
ls: cannot read symbolic link 'My Videos': Permission denied
Custom Office Templates  'My Music'  'My Pictures'  'My Videos'  desktop.ini  newFolder
user@W10P-B400fc2013:/mnt/c/Users/User/Documents$ rmdir newFolder
user@W10P-B400fc2013:/mnt/c/Users/User/Documents$ ls
ls: cannot read symbolic link 'My Music': Permission denied
ls: cannot read symbolic link 'My Pictures': Permission denied
ls: cannot read symbolic link 'My Videos': Permission denied
Custom Office Templates  'My Music'  'My Pictures'  'My Videos'  desktop.ini
user@W10P-B400fc2013:/mnt/c/Users/User/Documents$
```

The File Explorer window shows the 'Documents' folder, which contains a single item: 'Custom Office Templates'.

rmdir

- Remove directory

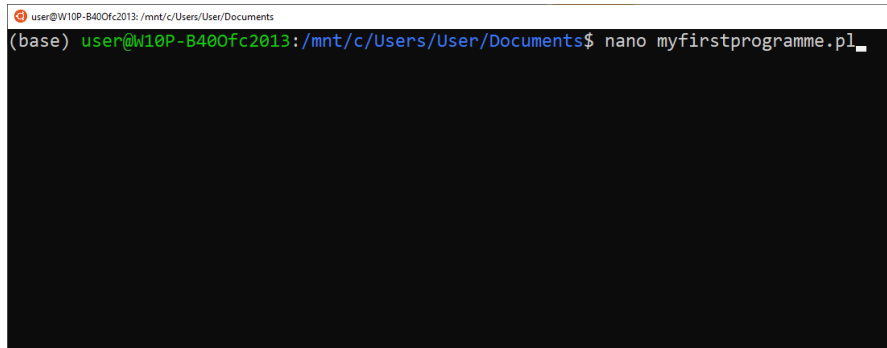
rmdir <folder name>

- for example we want to remove the “newFolder” **rmdir newFolder**
- checking with windows browser, “newFolder” should now be removed

Printing 'Hello World' – Starting nano

nano

- text editor for Linux System to create your first Perl script/code

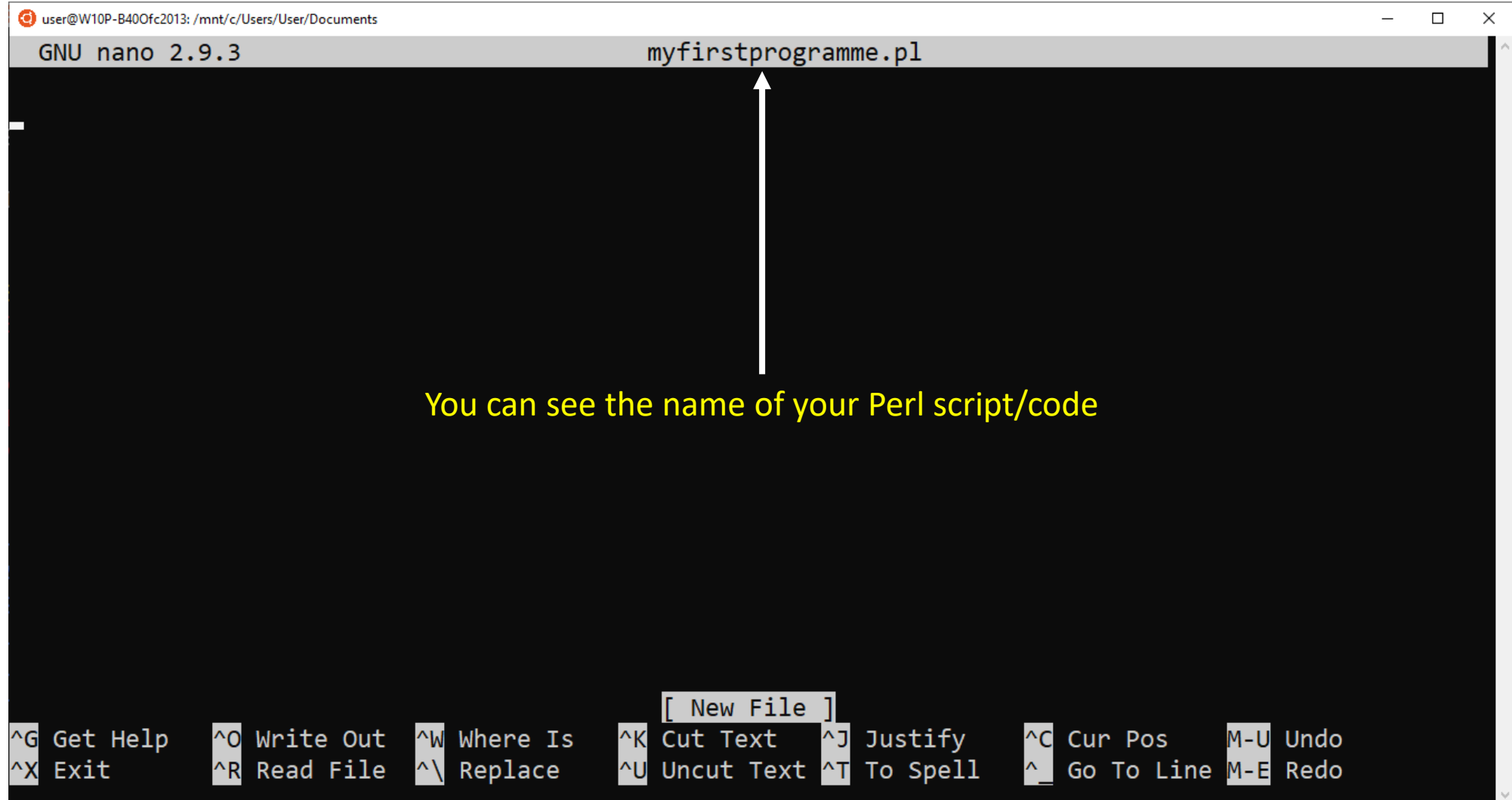


```
user@W10P-B400fc2013: /mnt/c/Users/User/Documents
(base) user@W10P-B400fc2013:/mnt/c/Users/User/Documents$ nano myfirstprogramme.pl
```

nano <name of Perl script/code>.pl

- For example: **nano myfirstprogramme.pl**

Printing 'Hello World' – Inside nano



user@W10P-B40Ofc2013: /mnt/c/Users/User/Documents

GNU nano 2.9.3 myfirstprogramme.pl

You can see the name of your Perl script/code

[New File]

^G Get Help	^O Write Out	^W Where Is	^K Cut Text	^J Justify	^C Cur Pos	M-U Undo
^X Exit	^R Read File	^_ Replace	^U Uncut Text	^T To Spell	^_ Go To Line	M-E Redo

Printing 'Hello World' – Inside nano



The screenshot shows the GNU nano 2.9.3 text editor interface. The title bar indicates the user is at 'user@W10P-B40Ofc2013' in the directory '/mnt/c/Users/User/Documents', editing the file 'myfirstprogramme.pl'. The editor's status bar shows 'GNU nano 2.9.3', the filename 'myfirstprogramme.pl', and the word 'Modified'. The main editing area contains the code `print "Hello World!\n";` on the first line, with a cursor at the end. To the right of the code, there is instructional text: 'Type the command:' followed by `print "Hello World!\n";` in red, and 'To save and exit:' followed by 'Ctrl + o', 'Enter', and 'Ctrl + x' in red. At the bottom, a menu bar lists various commands with their corresponding keyboard shortcuts: '^G Get Help', '^O Write Out', '^W Where Is', '^K Cut Text', '^J Justify', '^C Cur Pos', 'M-U Undo', '^X Exit', '^R Read File', '^_ Replace', '^U Uncut Text', '^T To Spell', '^_ Go To Line', and 'M-E Redo'. A '[New File]' button is also visible in the center of the menu bar.

```
user@W10P-B40Ofc2013: /mnt/c/Users/User/Documents
GNU nano 2.9.3 myfirstprogramme.pl Modified
print "Hello World!\n";

Type the command:
print "Hello World!\n";

To save and exit:
Ctrl + o
Enter
Ctrl + x

[ New File ]
^G Get Help  ^O Write Out  ^W Where Is  ^K Cut Text  ^J Justify   ^C Cur Pos   M-U Undo
^X Exit      ^R Read File  ^_ Replace   ^U Uncut Text ^T To Spell  ^_ Go To Line M-E Redo
```

Printing 'Hello World' – Back to Ubuntu

```
user@W10P-B400fc2013: /mnt/c/Users/User/Documents
(base) user@W10P-B400fc2013:~$ cd /mnt/c/Users/User/D
Desktop/  Documents/ Downloads/
(base) user@W10P-B400fc2013:~$ cd /mnt/c/Users/User/Documents/
(base) user@W10P-B400fc2013:/mnt/c/Users/User/Documents$ nano myfirstprogramme.pl
(base) user@W10P-B400fc2013:/mnt/c/Users/User/Documents$ ls
ls: cannot read symbolic link 'My Music': Permission denied
ls: cannot read symbolic link 'My Pictures': Permission denied
ls: cannot read symbolic link 'My Videos': Permission denied
'Custom Office Templates' 'My Pictures' desktop.ini myfirstprogramme.pl.save
'My Music' 'My Videos' myfirstprogramme.pl
(base) user@W10P-B400fc2013:/mnt/c/Users/User/Documents$ _

user@W10P-B400fc2013: /mnt/c/Users/User/Documents
(base) user@W10P-B400fc2013:~$ cd /mnt/c/Users/User/D
Desktop/  Documents/ Downloads/
(base) user@W10P-B400fc2013:~$ cd /mnt/c/Users/User/Documents/
(base) user@W10P-B400fc2013:/mnt/c/Users/User/Documents$ nano myfirstprogramme.pl
(base) user@W10P-B400fc2013:/mnt/c/Users/User/Documents$ ls
ls: cannot read symbolic link 'My Music': Permission denied
ls: cannot read symbolic link 'My Pictures': Permission denied
ls: cannot read symbolic link 'My Videos': Permission denied
'Custom Office Templates' 'My Pictures' desktop.ini myfirstprogramme.pl.save
'My Music' 'My Videos' myfirstprogramme.pl
(base) user@W10P-B400fc2013:/mnt/c/Users/User/Documents$ perl myfirstprogramme.pl
Hello World!
(base) user@W10P-B400fc2013:/mnt/c/Users/User/Documents$
```

To check if perl script/code is present:

Is

you can see it here!

To run your Hello World script:

perl myfirstprogramme.pl

Hello World! is now printed