# PROJECT - NGUYÊN LÝ HỆ ĐIỀU HÀNH Học kỳ I – 2021-2022

**Máy ảo sử dụng: Ubuntu VM**

**HỌ VÀ TÊN: Võ Minh Kha MSSV: B1906488**

**Tuyên bố: Project này là do chính tôi, *Họ và tên SV* (MSSV: B1906488), tự thực hiện, không**

**sao chép của bất kỳ ai. Nếu có bất cứ sao chép nào, tôi hoàn toàn chịu trách nhiệm.**

**PHẦN 1: XÂY DỰNG LINUX KERNEL**

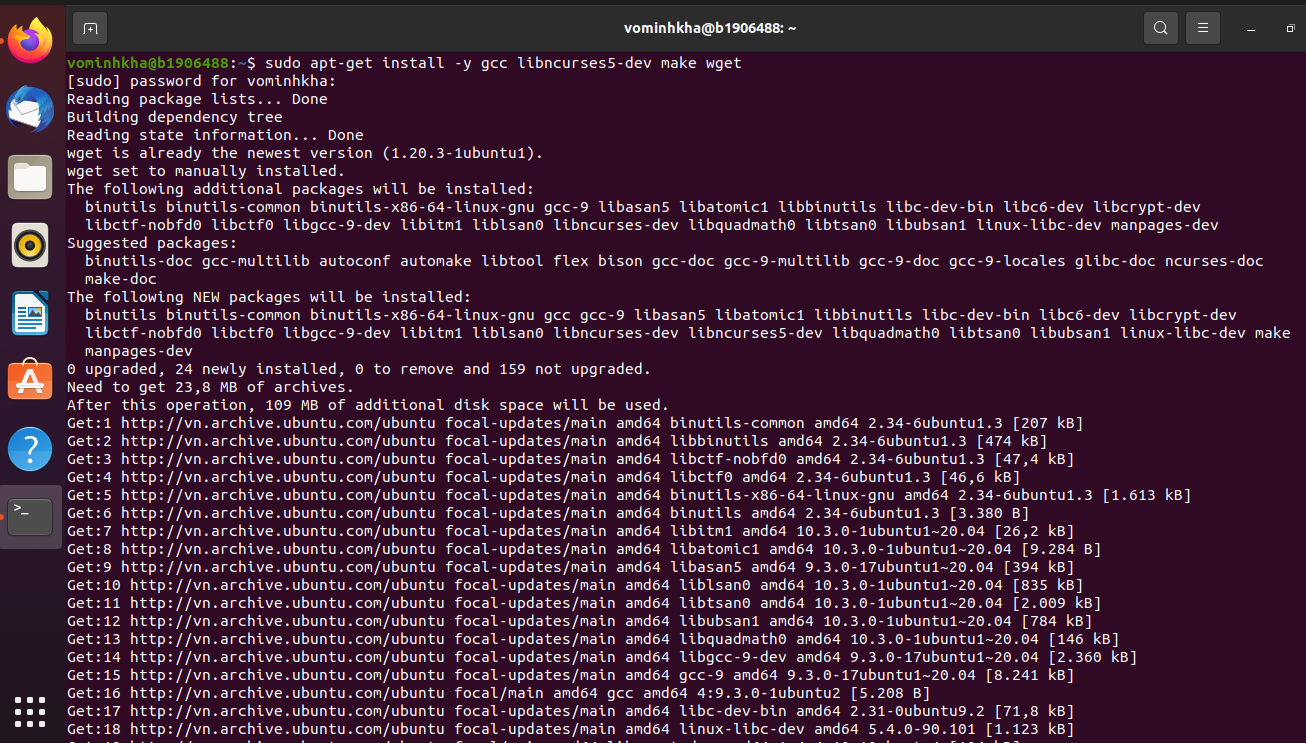
Thực hiện ở chế độ người dùng root (root user)

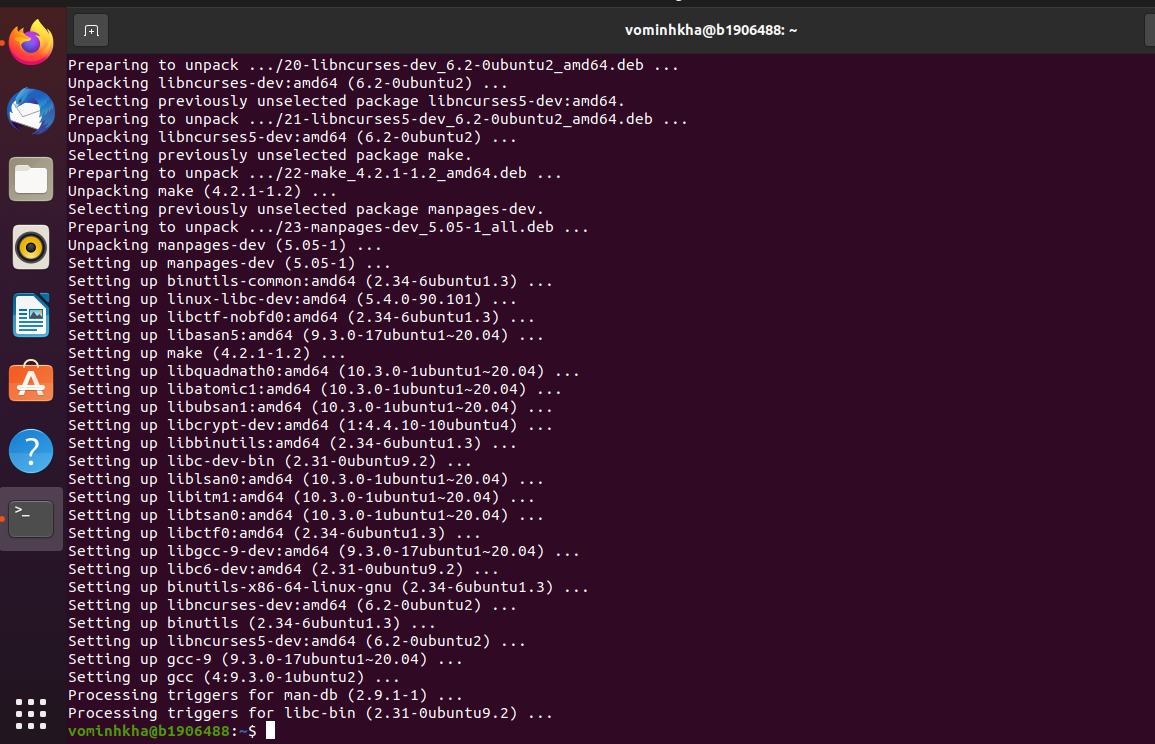
# $su -

1. CHUẨN BỊ LINUX KERNEL CODE

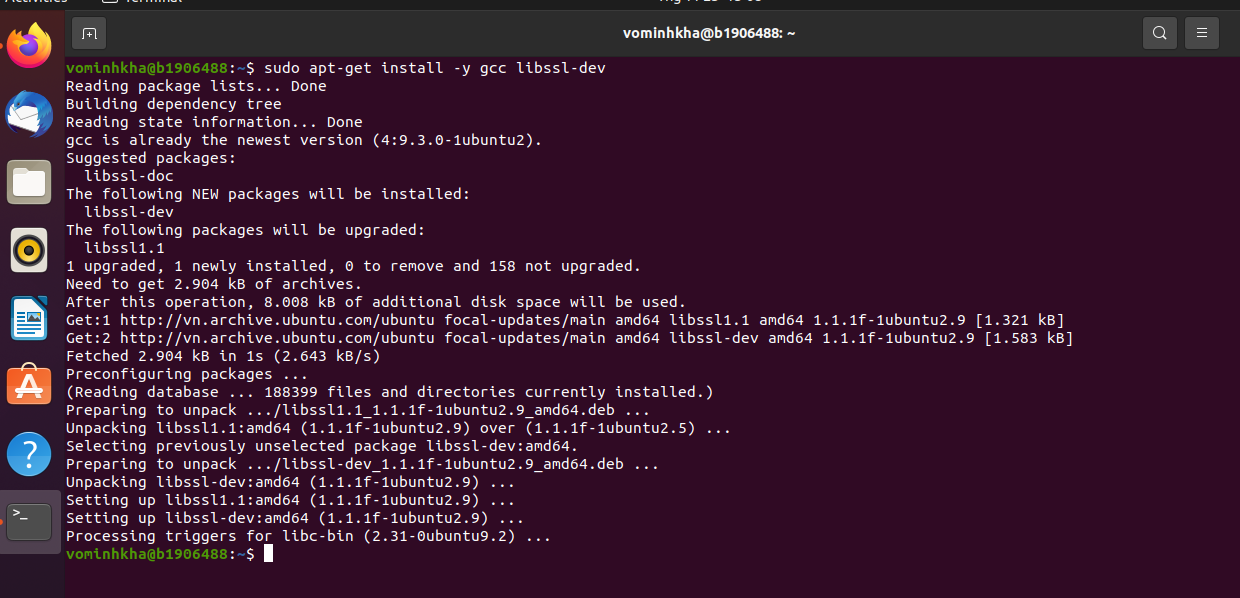
Download và cài đặt tool cần thiết vào hệ thống

# $sudo apt-get install -y gcc libncurses5-dev make wget

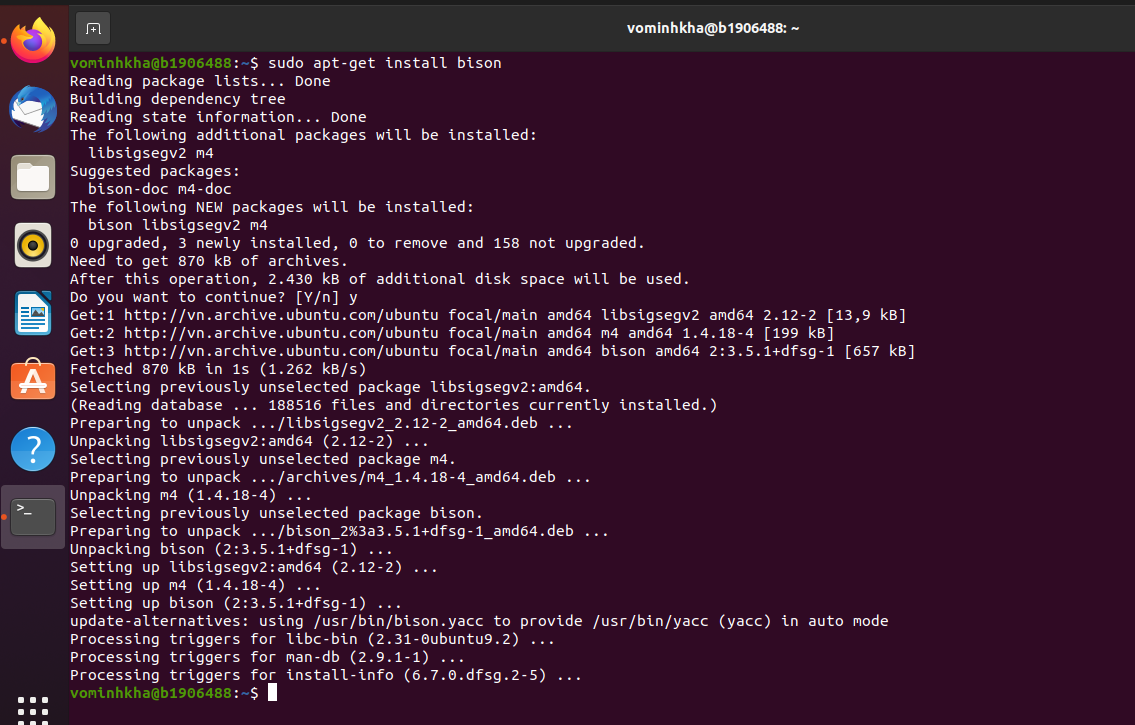




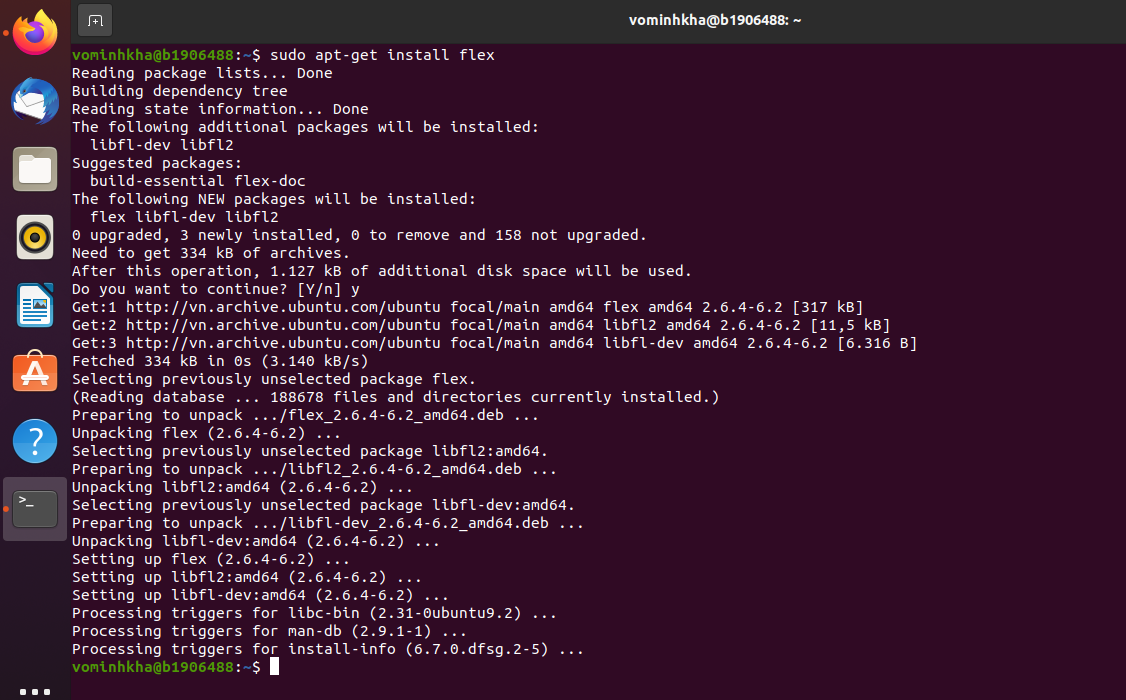
**$sudo apt-get install -y gcc libssl-dev**

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**$sudo apt-get install bison**

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**$sudo apt-get install flex**

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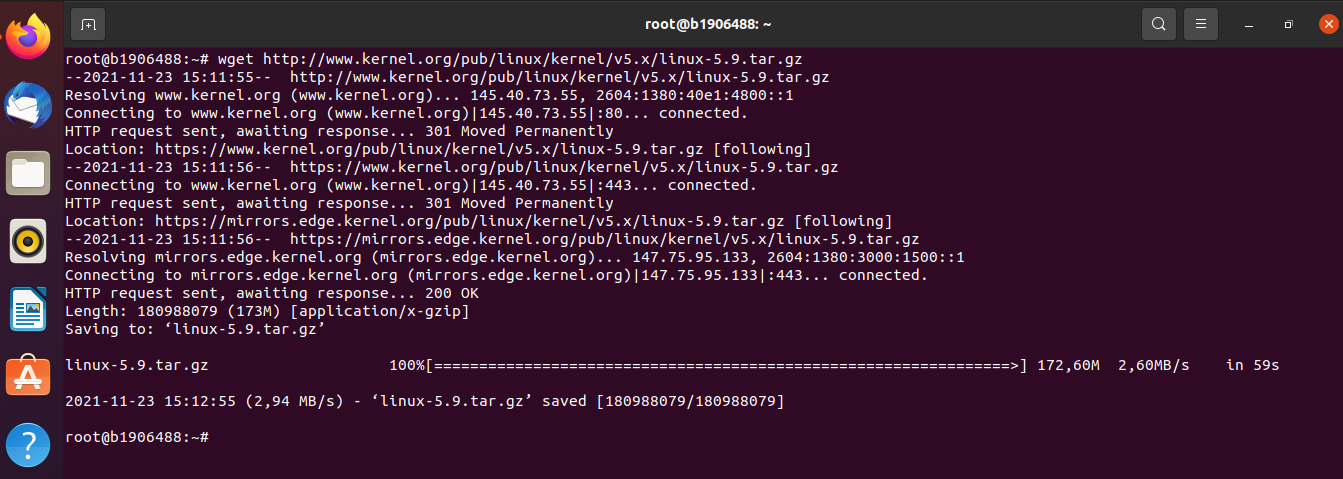
1. Xác định phiên bản hiện tại của kernel:

# # uname –r

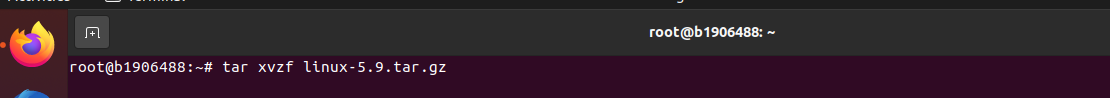


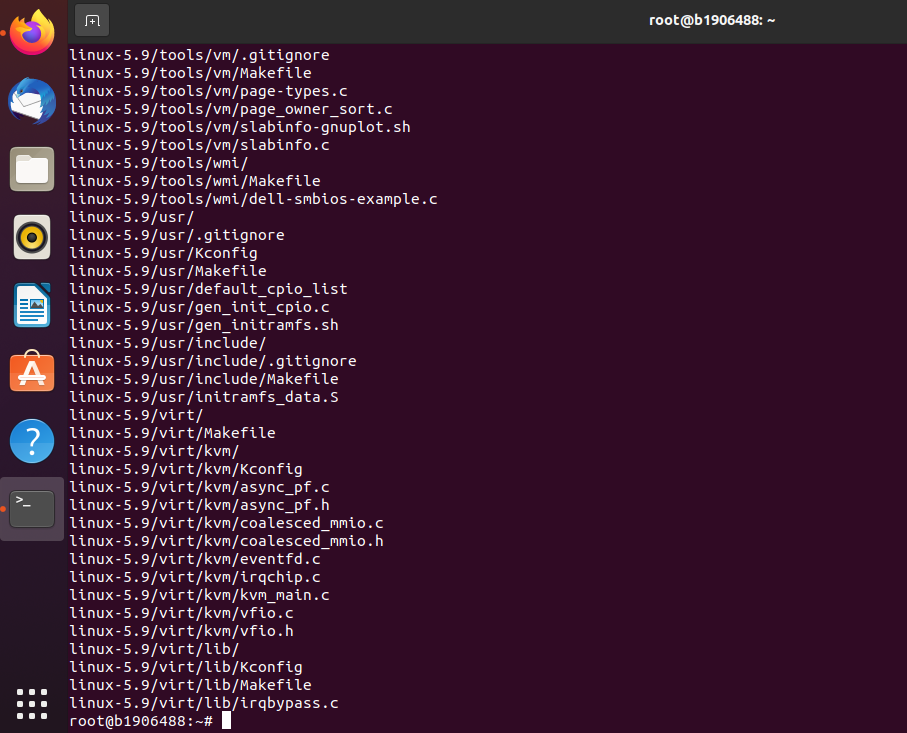
1. Truy cập [http://kernel.org ho](http://kernel.org/)ặc [https://cdn.kernel.org/pub/linux/kernel/ và](https://cdn.kernel.org/pub/linux/kernel/) download source code của kerenl hiện tại. Kế tiếp, download kernel 5.9 và giải nén source code:

**# w[get http://www.kernel.org/pub/linux/kernel/v5.x/linux](http://www.kernel.org/pub/linux/kernel/v5.x/)-5.9.tar.gz**

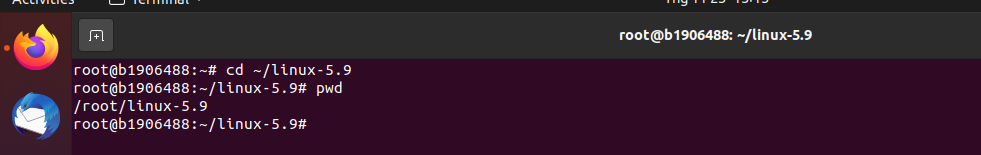
****

**# tar xvzf linux-5.9.tar.gz**



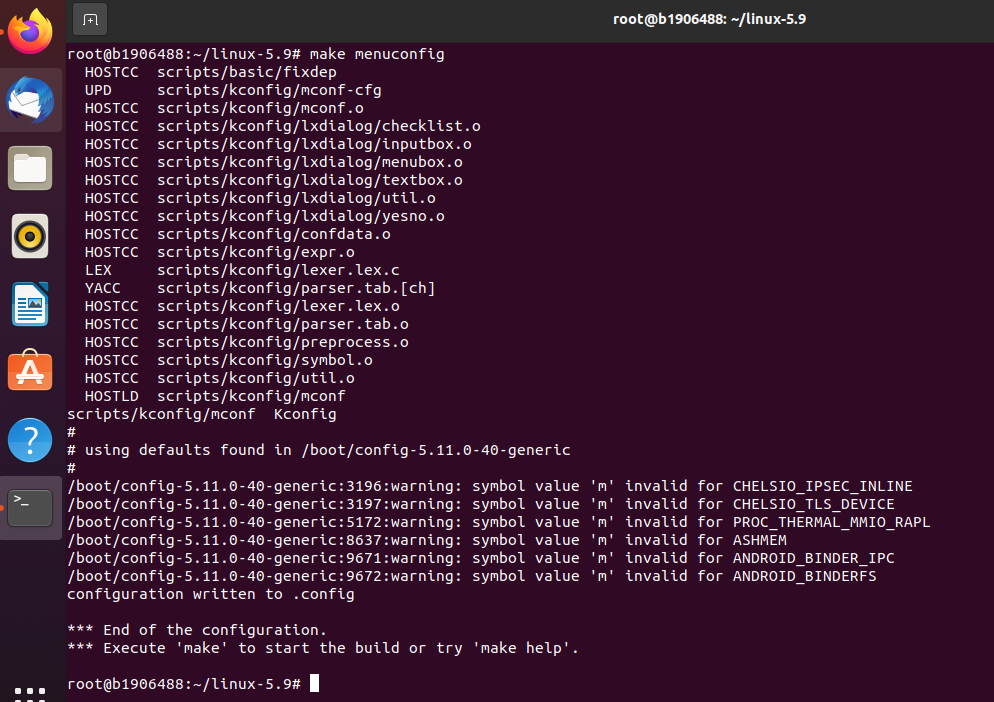


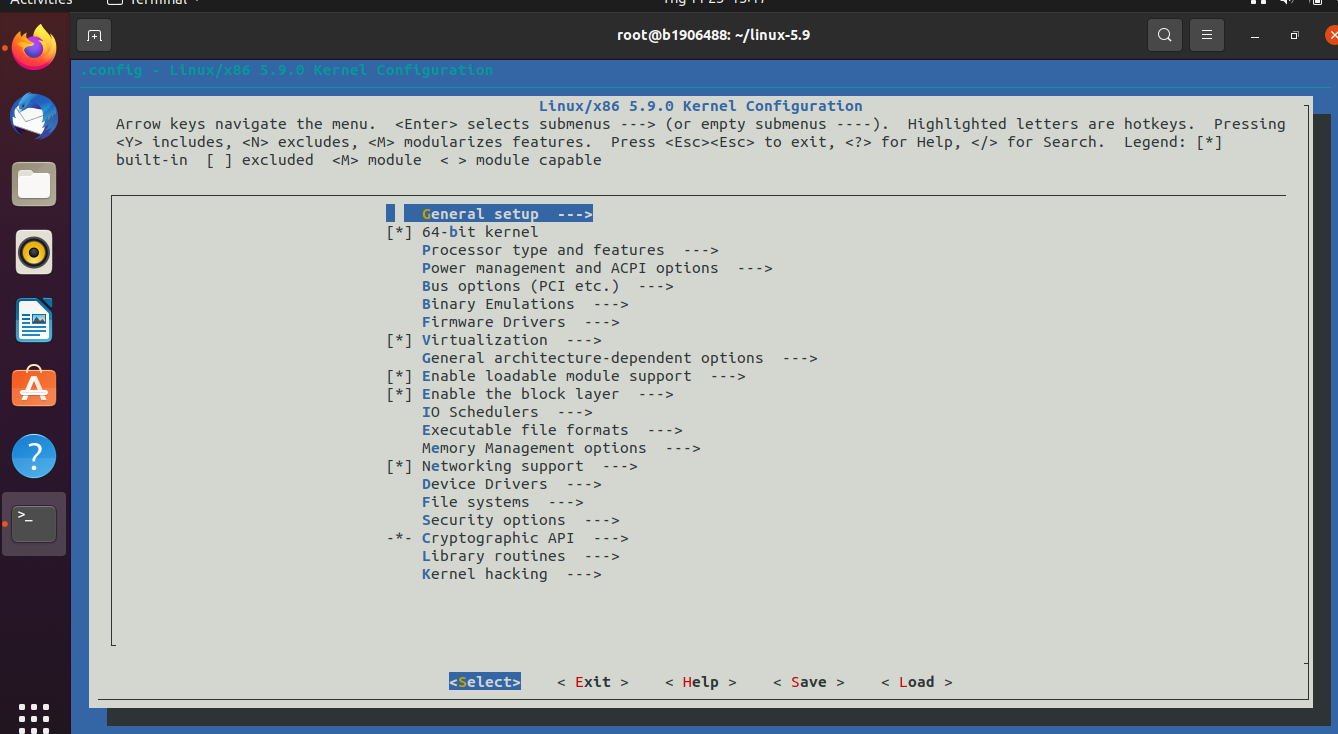
1. CẤU HÌNH KERNEL MỚI
   1. Đảm bảo đường dẫn hiện tại ở **~/linux-5.9** và “**linux-5.9**” ở top directory của kernel source.



* 1. Tạo file cấu hình (config file)

# # make menuconfig

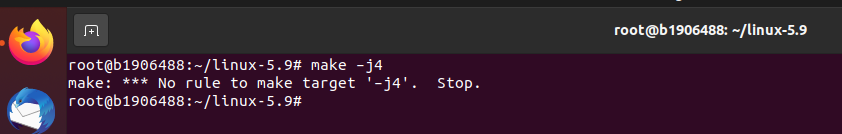


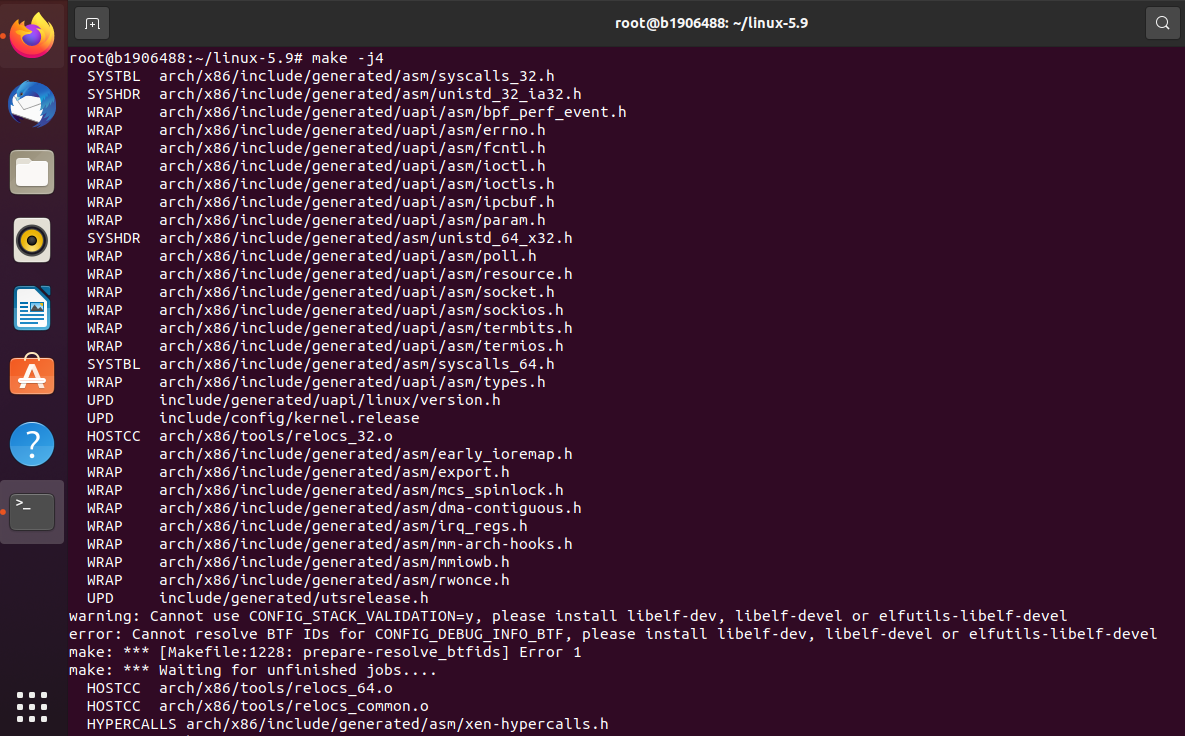


1. BIÊN DỊCH KERNEL
   1. Tại **~/linux-5.9**, tạo kernel image nén (compressed kernel image)

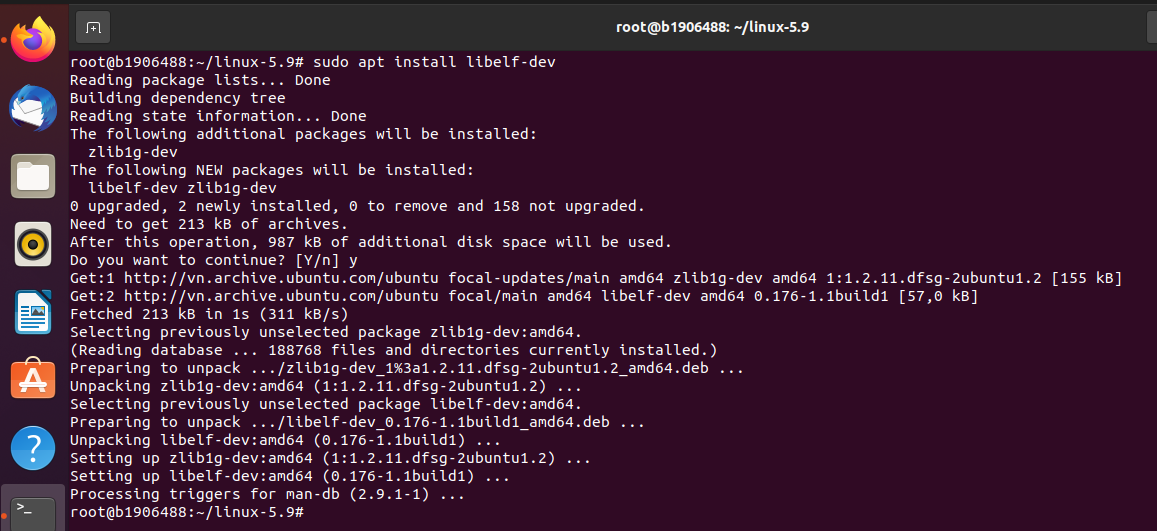
# # make –j4

**Lỗi**

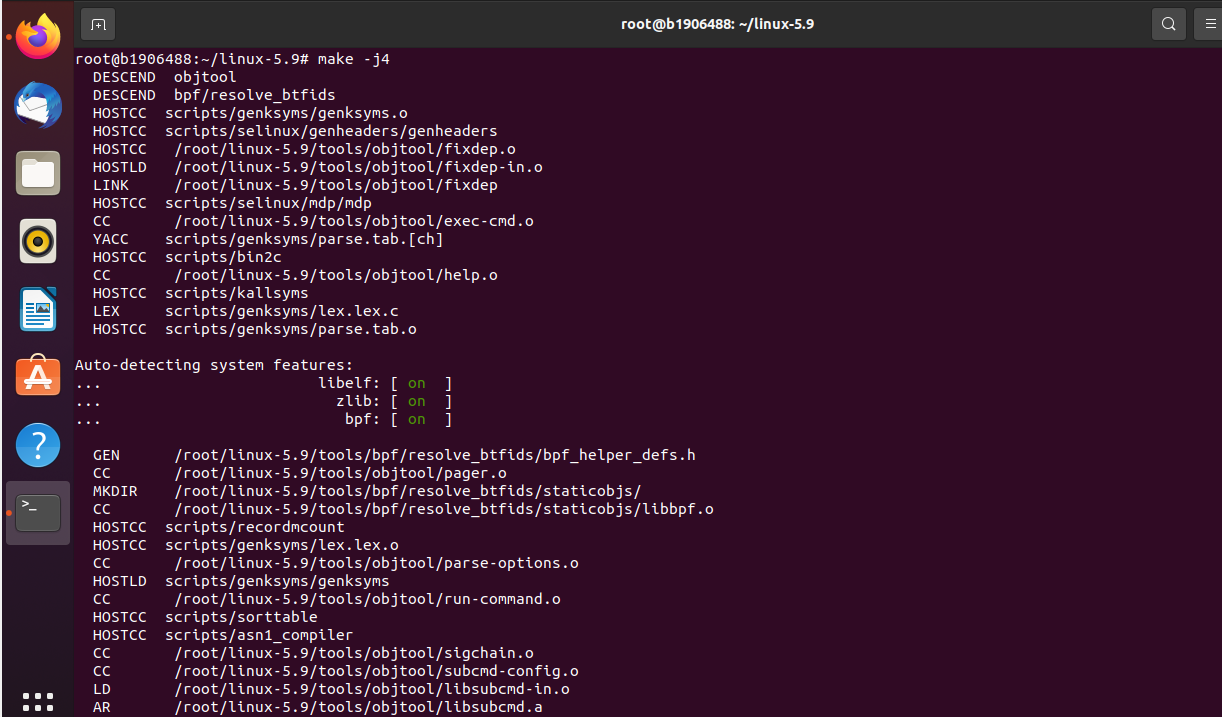


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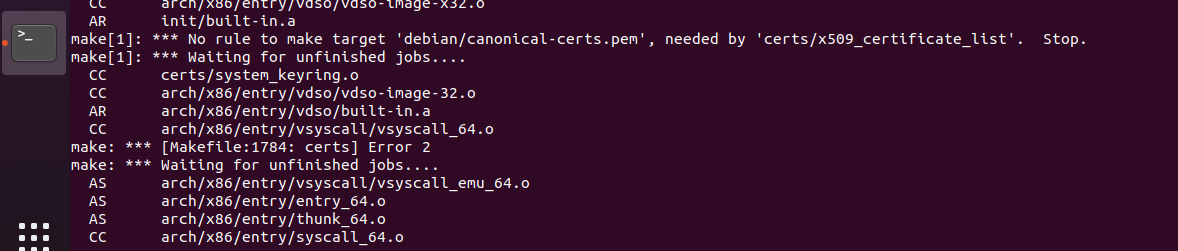
**Cài libelf-dev**

****

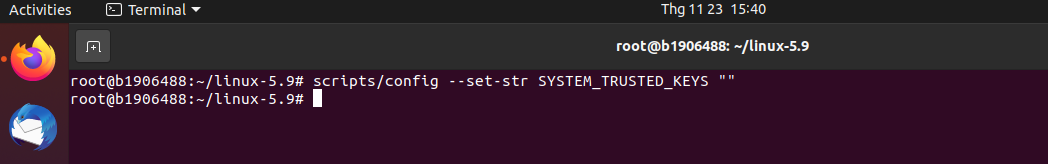
**Chạy lại**

****

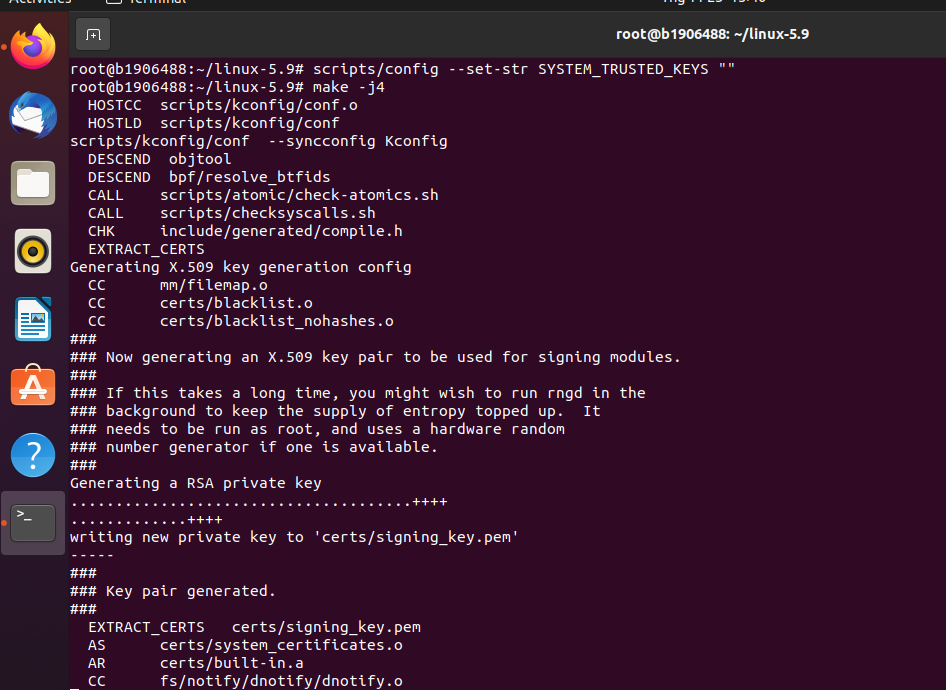
**Lỗi**

****

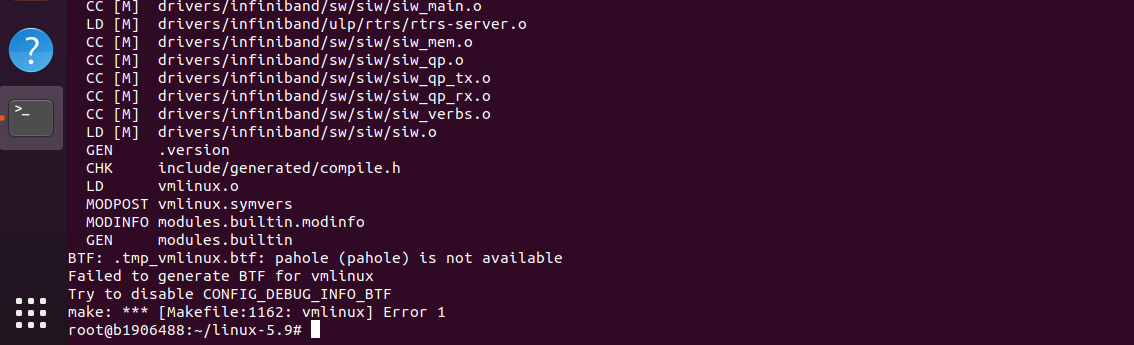
**Fix**

****

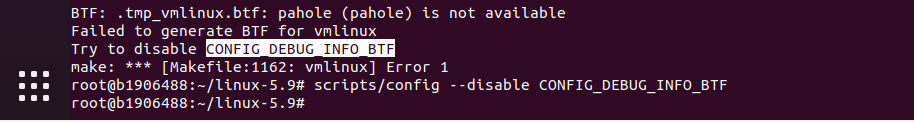
**Chạy lại**

****

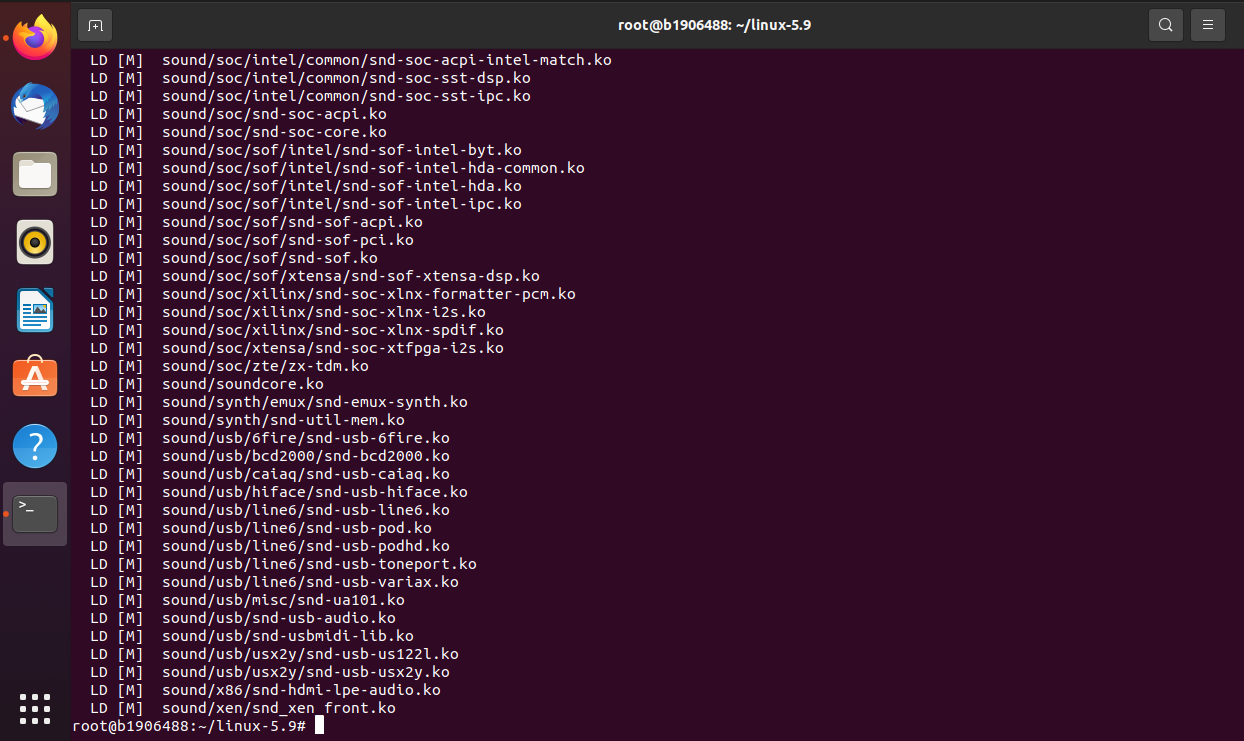
**Lỗi:**

****

**Fix:**

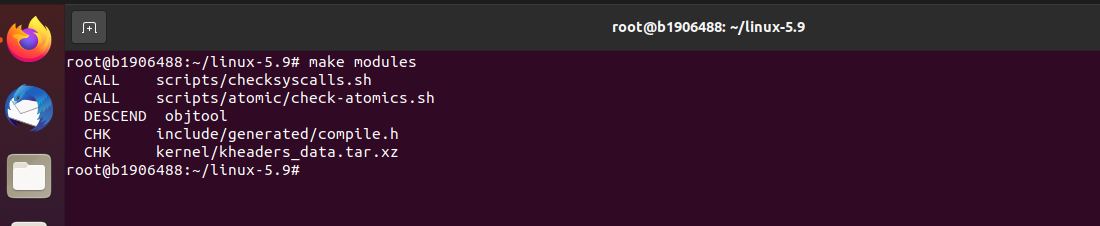
****

**Chạy lại:**

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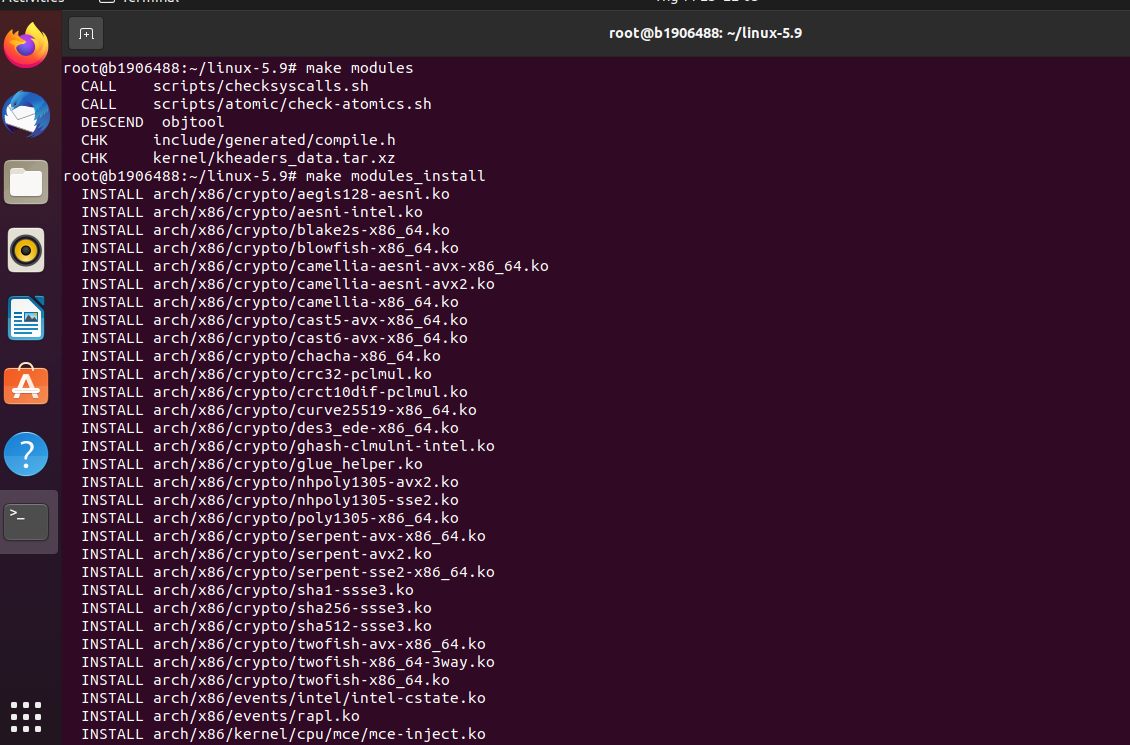
* 1. Biên dịch kernel modules:

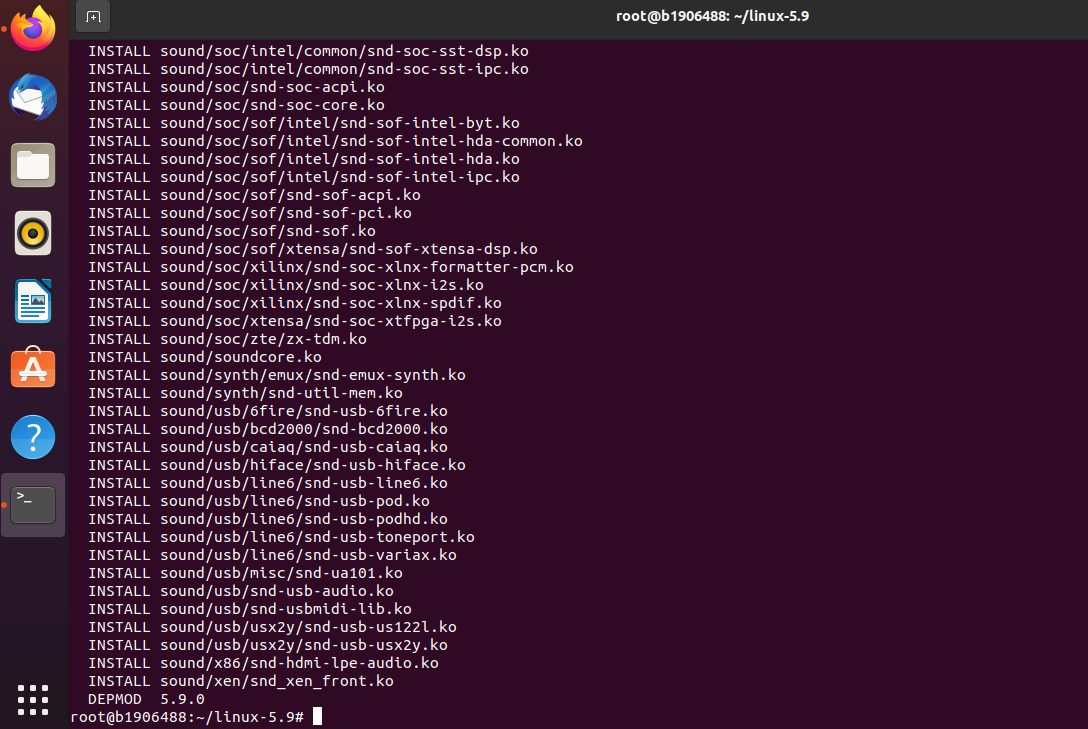
# # make modules



1. CÀI ĐẶT KERNEL
   1. Cài đặt kernel modules

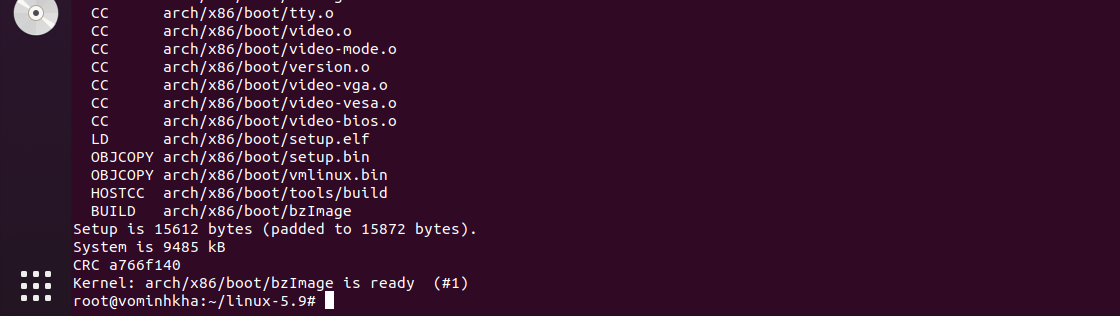
# # make modules\_install



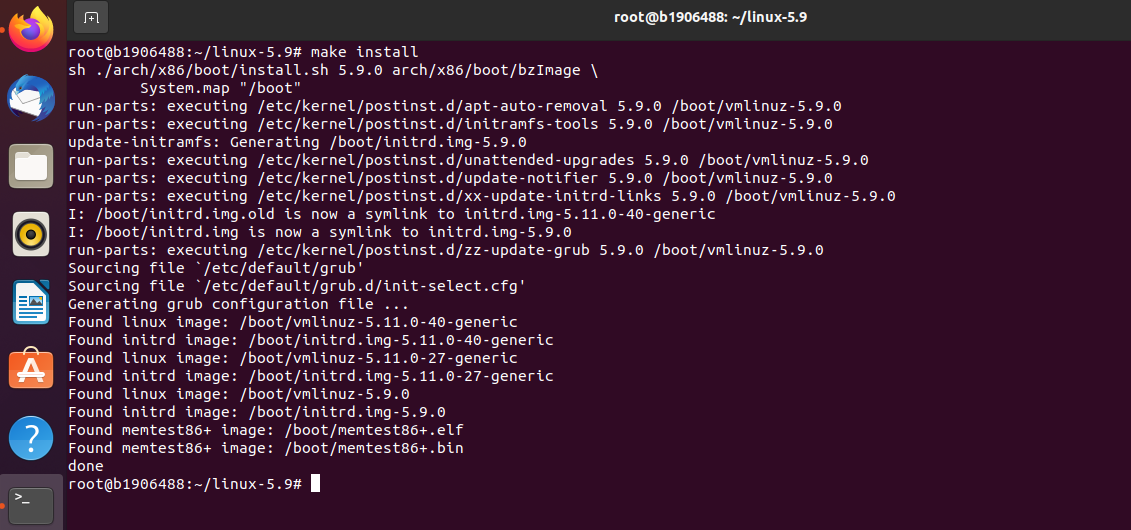


* 1. Cài đặt the kernel

# # make install



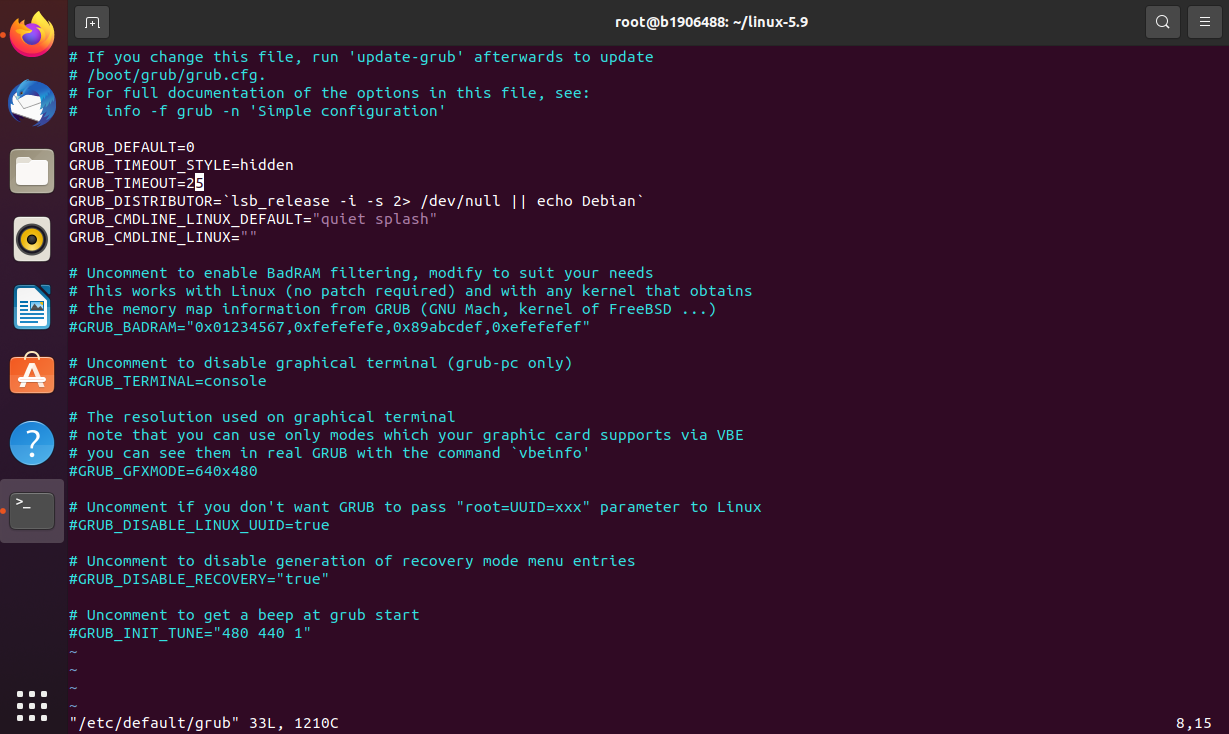
Chạy lại **make install**



1. THAY ĐỔI FILE CẤU HÌNH GRUB (GRUB CONFIGURATION FILE) Thay đổi file cấu hình grub:

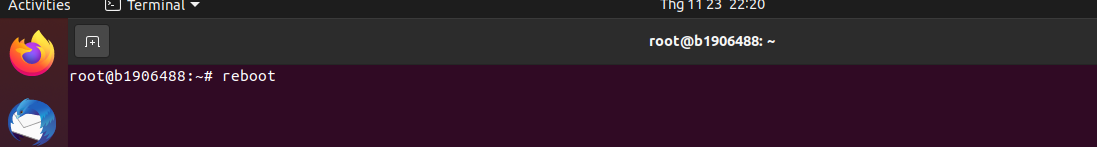
# # vim /etc/default/grub

Thực hiện các thay đổi sau: GRUB\_DEFAULT=0 GRUB\_TIMEOUT=25



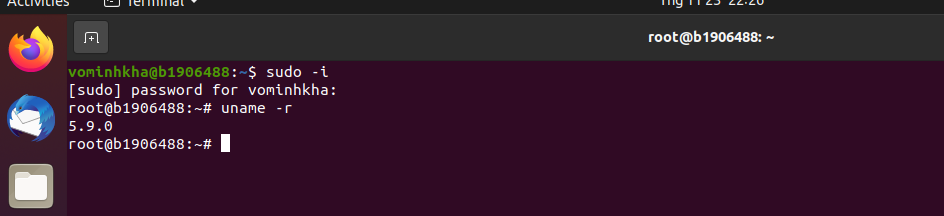
1. REBOOT VM
   1. Reboot kernel mới:

# # reboot



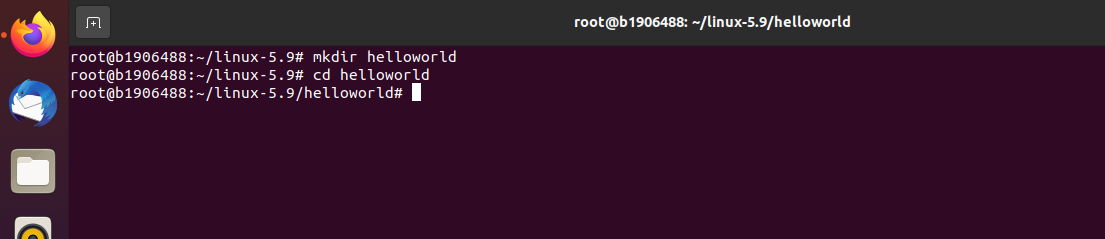
* 1. Sau khi boot, kiểm tra thông tin kernel mới có đúng chưa:

# # uname -r



**PHẦN 2: THÊM LỜI GỌI HỆ THỐNG VÀO LINUX KERNEL**

Tạo một thư mục helloworld tại ~/linux-5.9 và cd vào helloworld



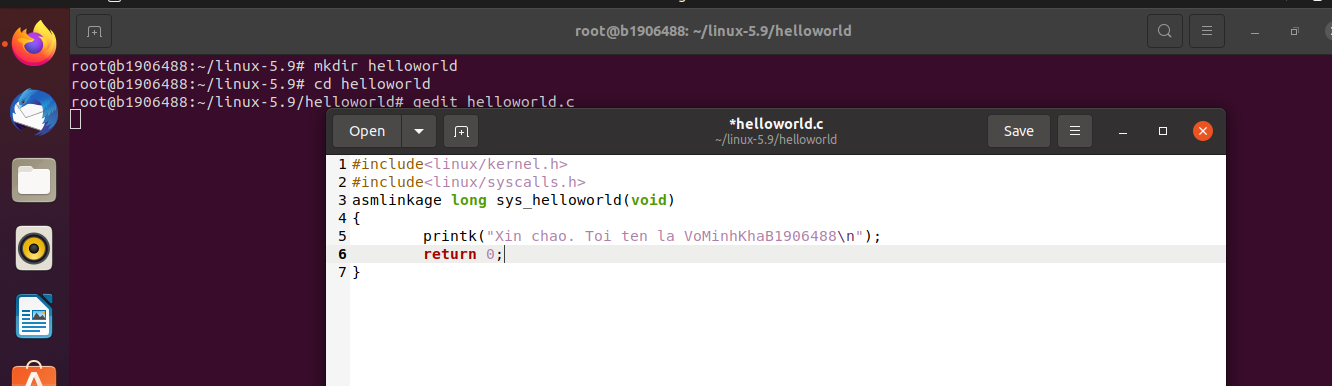
Tạo 1 file helloworld.c

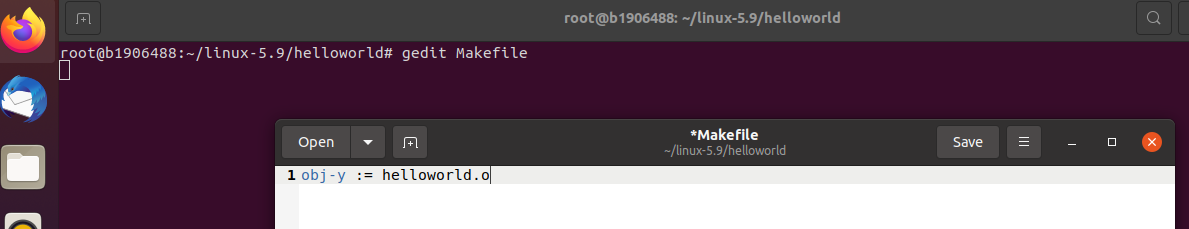


Trong file helloworld.c có nội dung

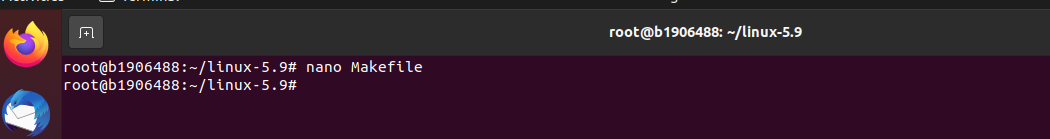


Tại thư mục helloworld tạo tạo Makefile với nội dung

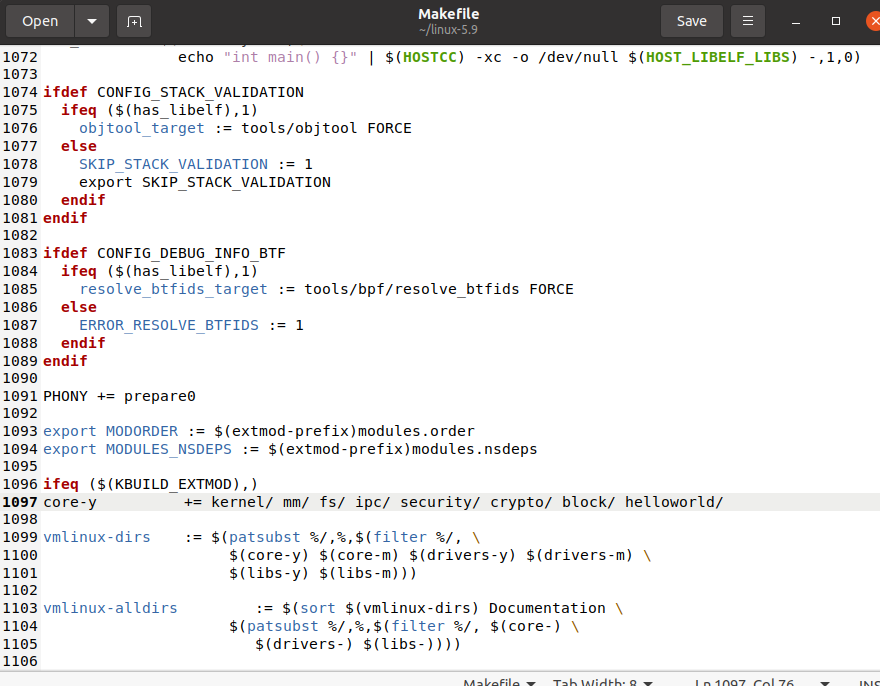




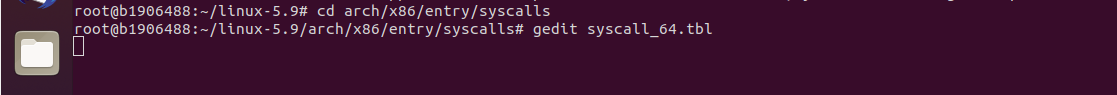
Thêm thư mục helloworld vào Makefile của kernel

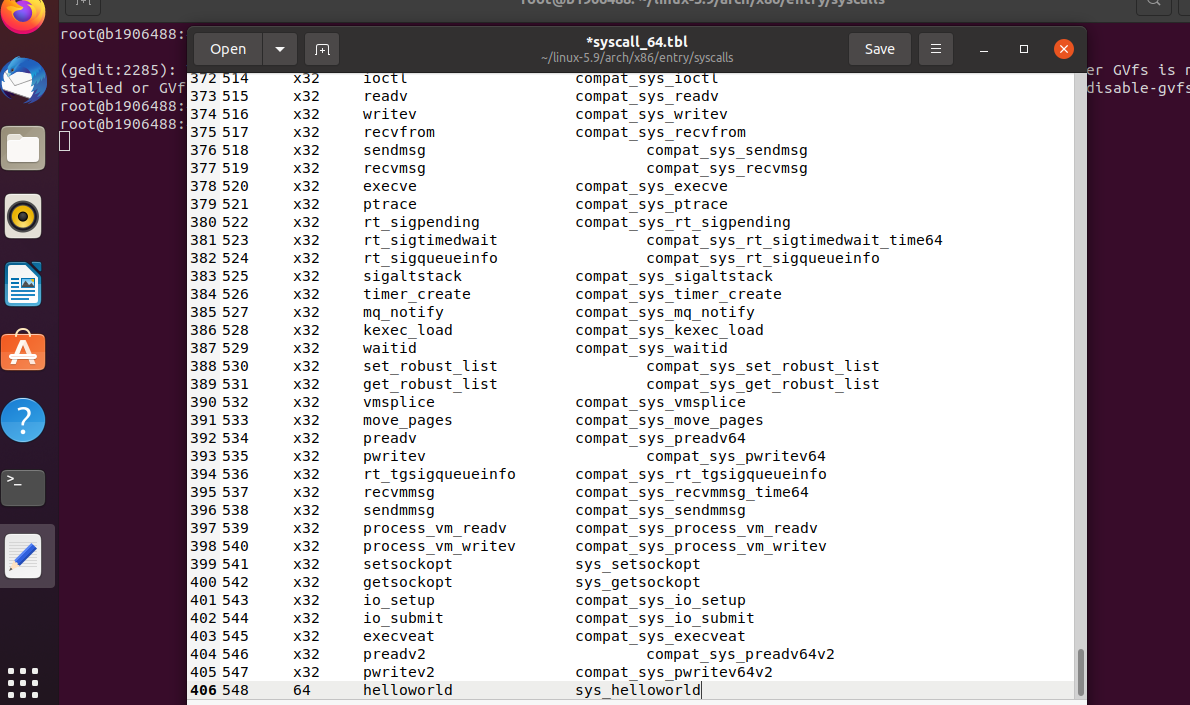


Đổi :- “*core-y += kernel/ mm/ fs/ ipc/ security/ crypto/ block/* “ đổi thành :- “*core-y += kernel/ mm/ fs/ ipc/ security/ crypto/ block/* helloworld/“



Thêm lệnh gọi hệ thống mới (sys\_helloworld ()) vào bảng gọi hệ thống (tệp syscall\_64.tbl)

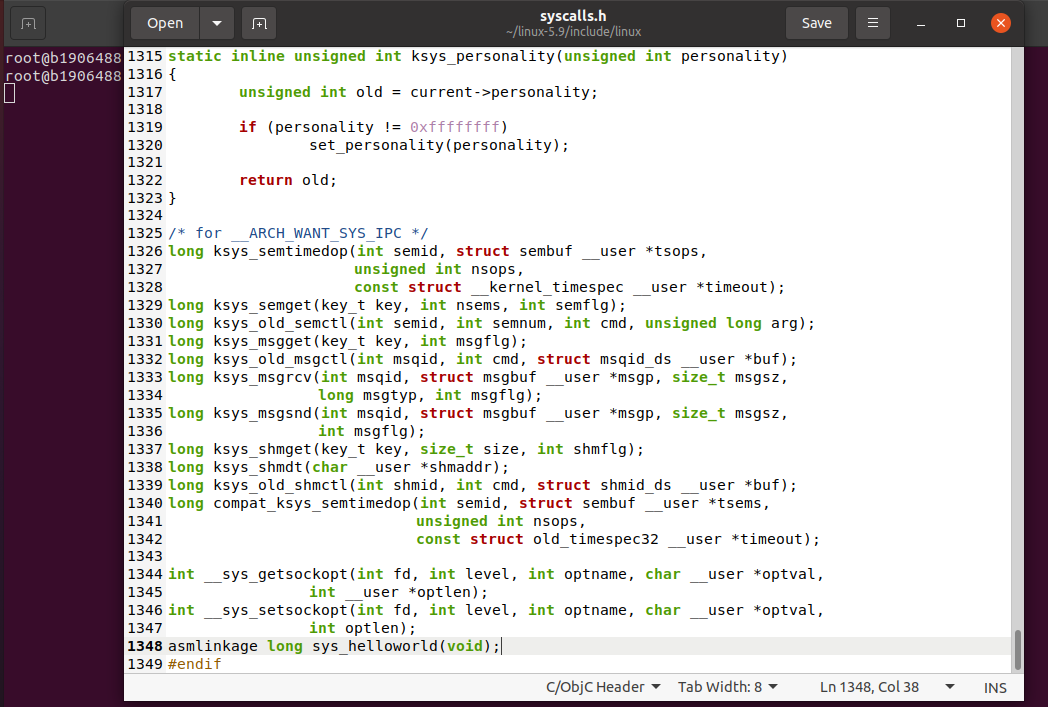




****Thêm lời gọi hệ thống (sys\_helloworld() )  in the system call header file.****

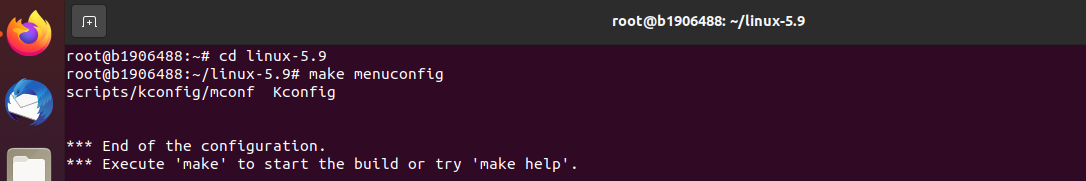
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Thêm dòng sau vào cuối tệp ngay trước câu lệnh #endif ở cuối tệp.

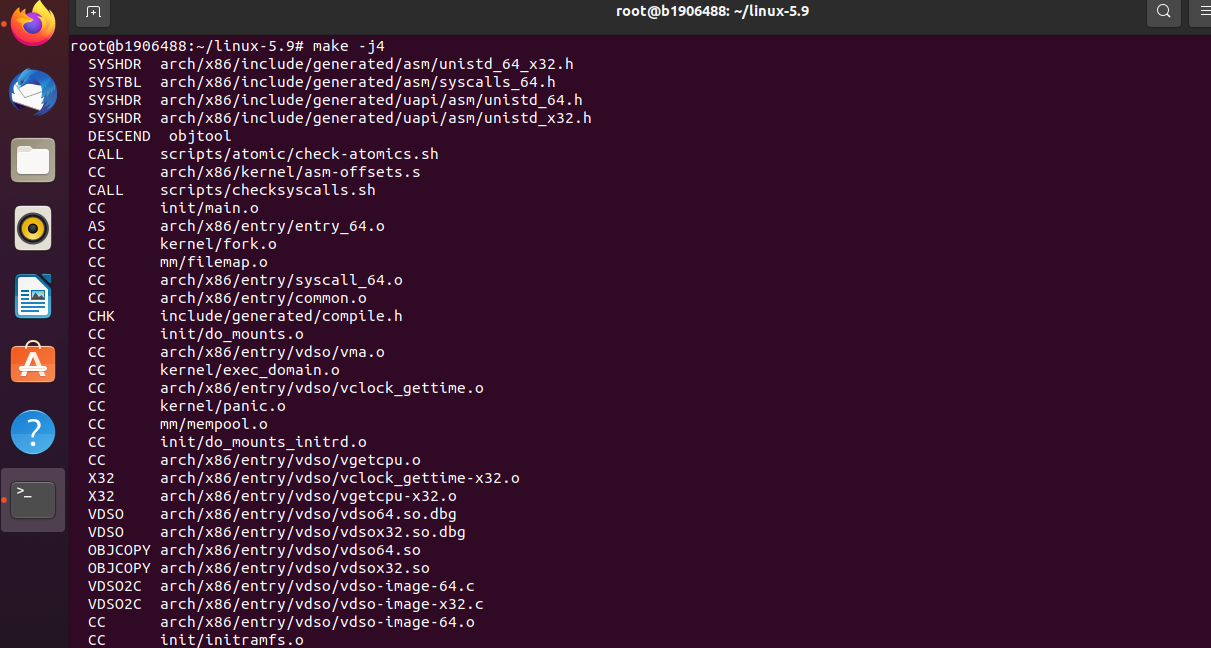


Biên dich kernel

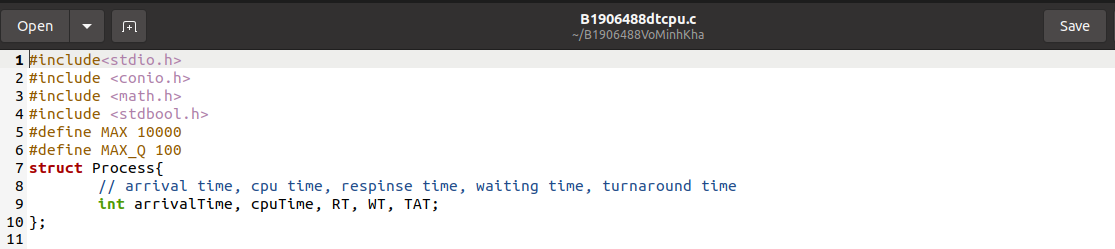
#make menuconfig

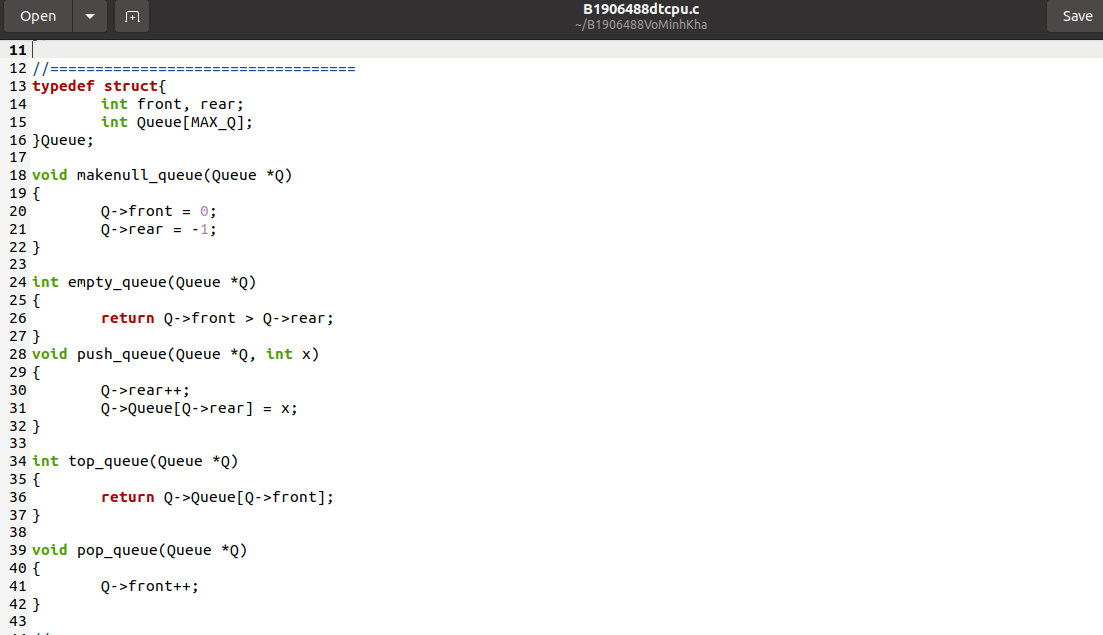


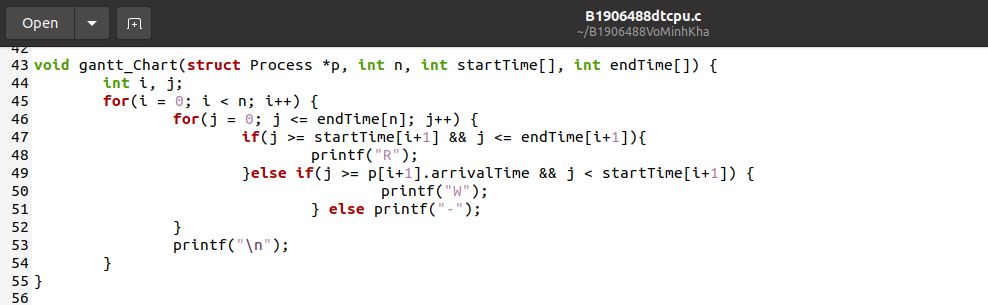
#make -j4



PHẦN 3: ĐỊNH THỜI CPU

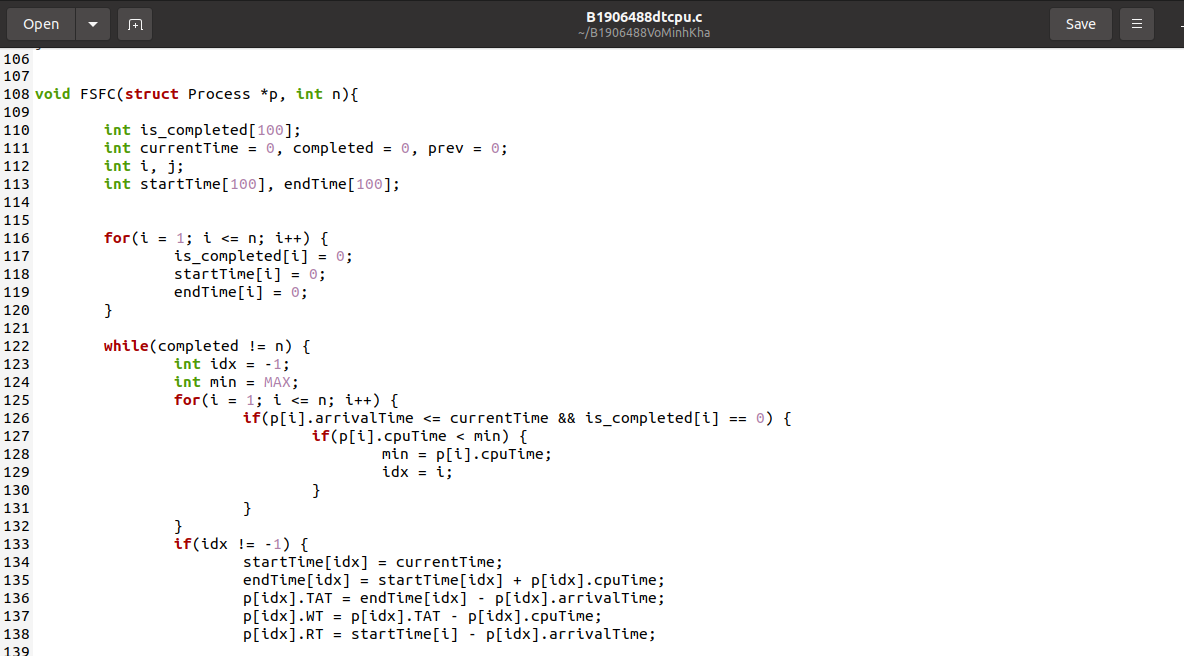


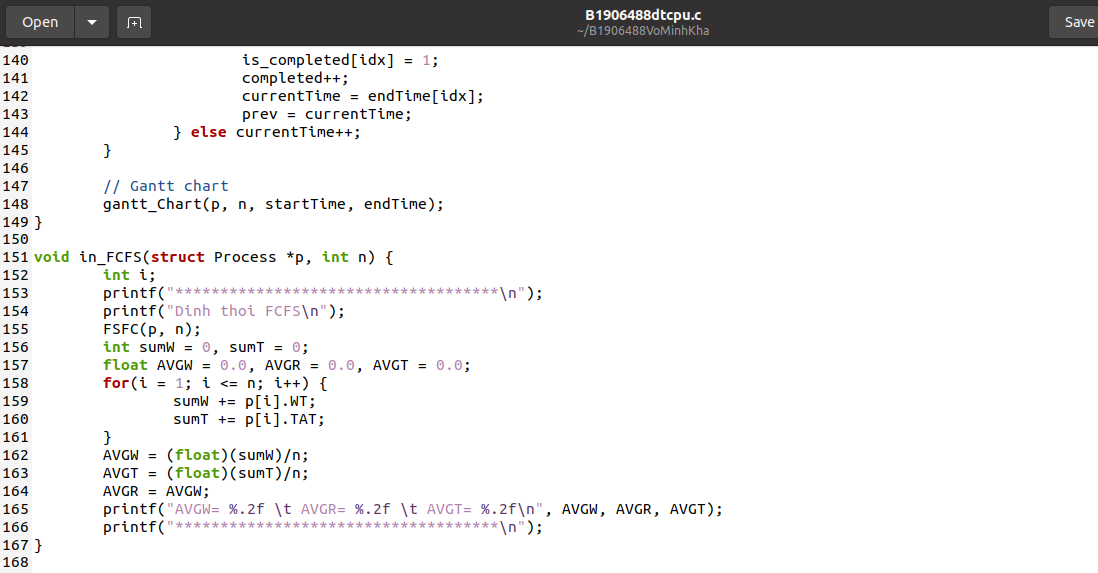


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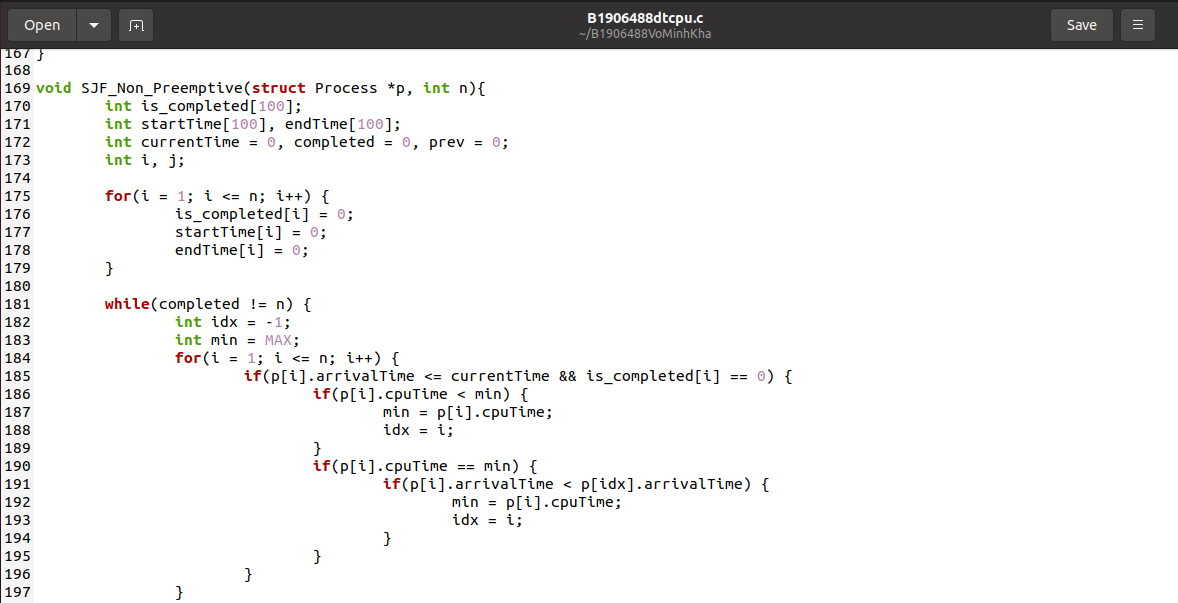


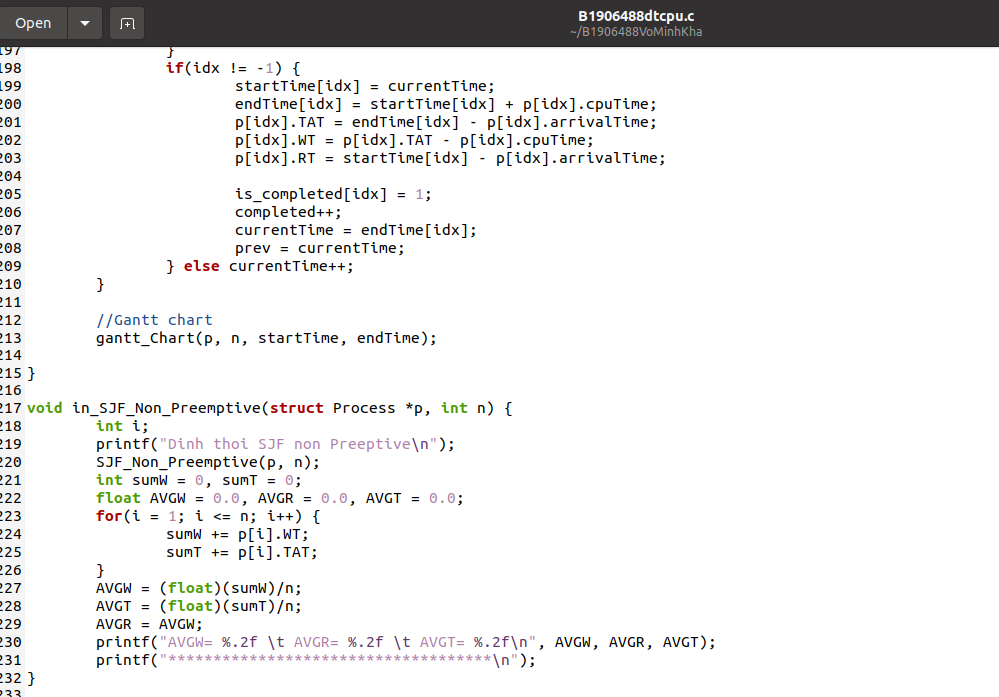
FCFS:



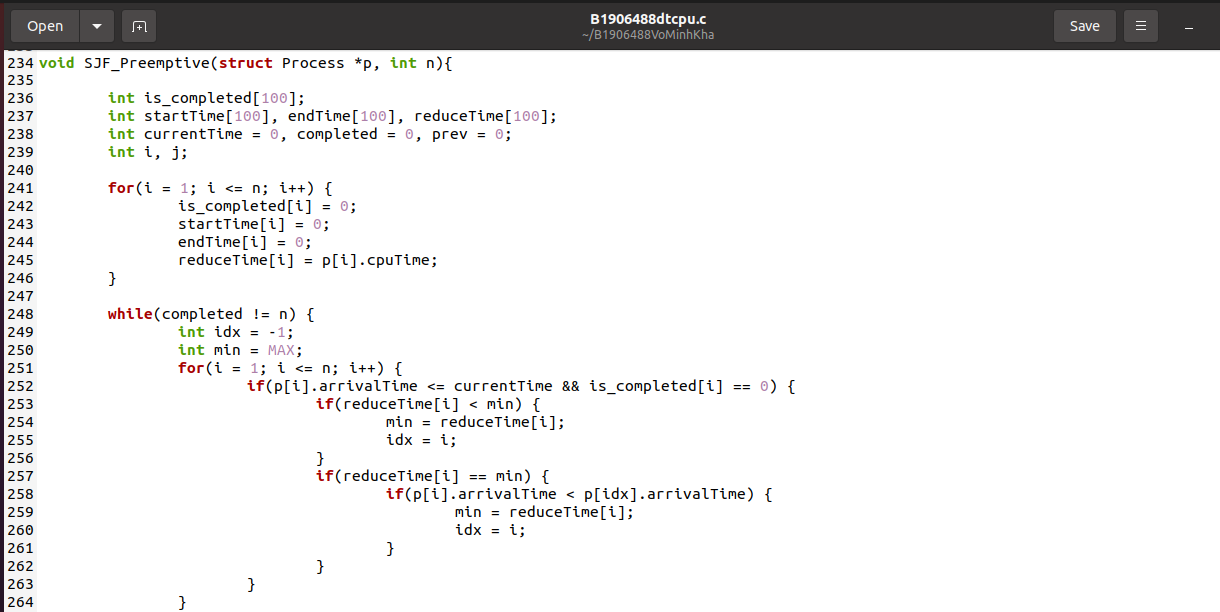


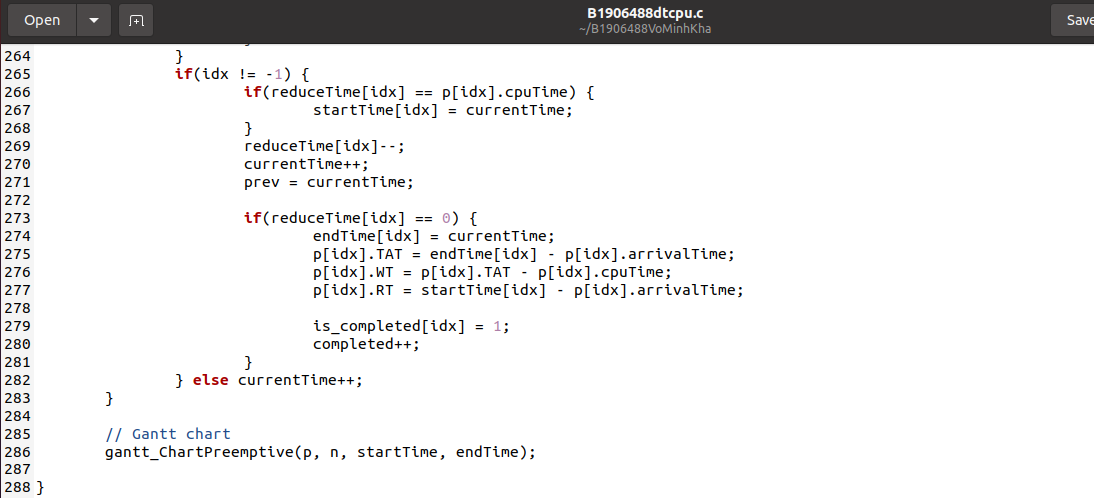
SJF Non Preenptive

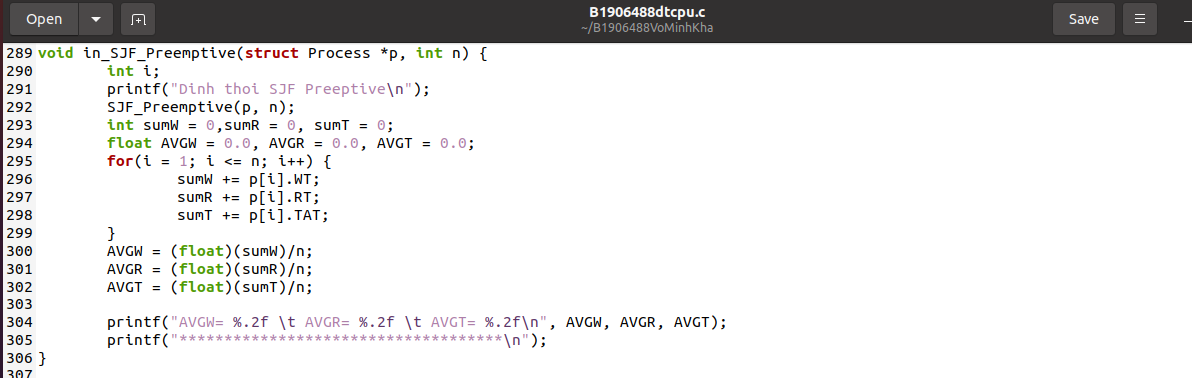




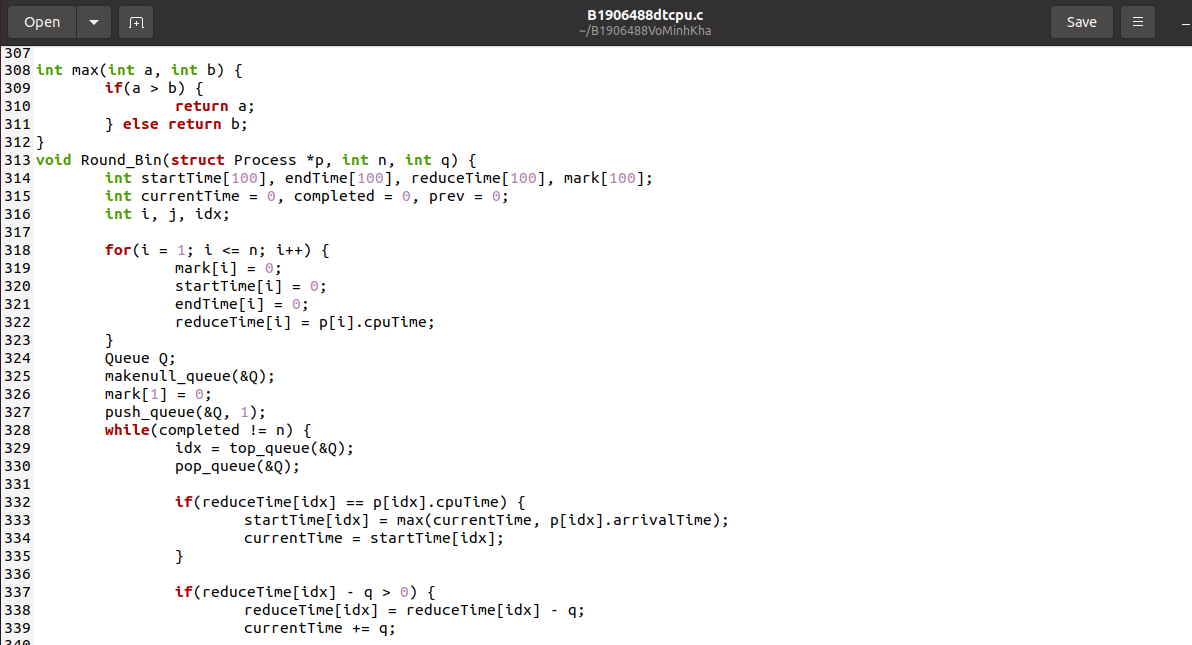
SJF Preenptive

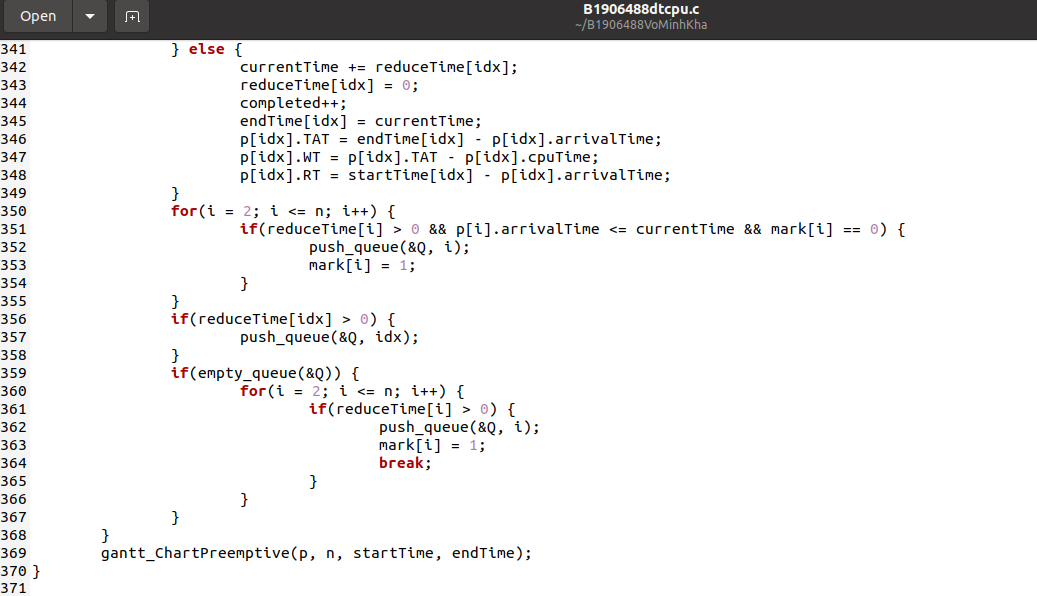


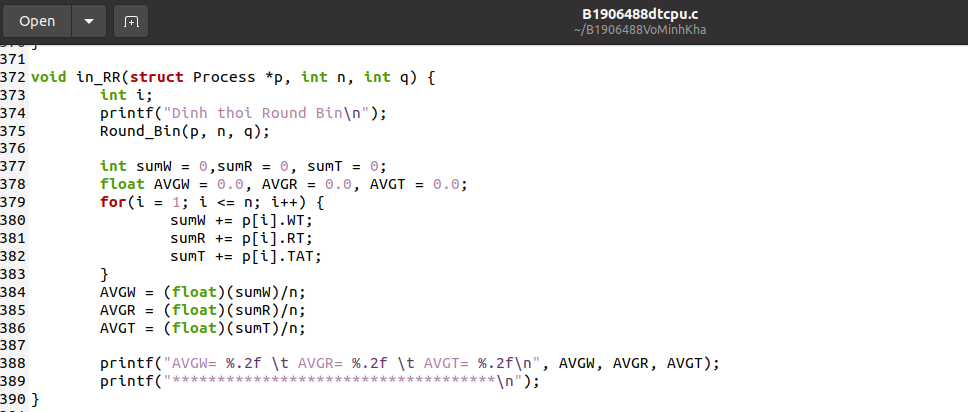




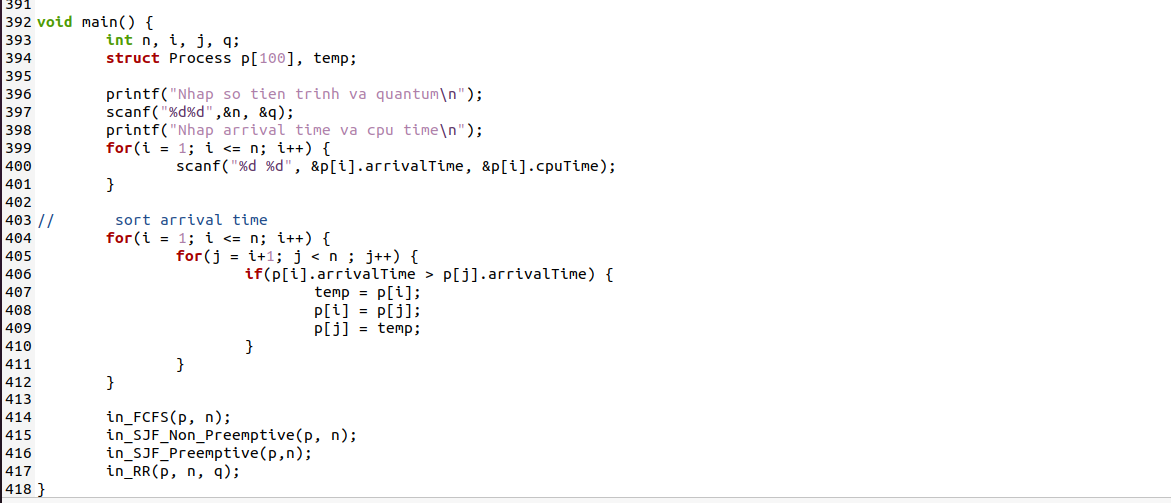
Round Bin







Hàm main



Chạy chương trình

