

# CSF2600505 Sistem Operasi CSGE602055 Operating Systems Week 00: Intro & Review1

Rahmat M. Samik-Ibrahim

University of Indonesia

<http://rms46.vlsm.org/2/207.html>

Always check for the latest revision!

REV120 22-FEB-2018

# Operating Systems 2018-1 (Room 3114 Tue/Thu)

Class: A (10:00-12:00) | B (13:00-15:00) | C (16:00-18:00)

Week	Schedule	Topic	OSC9
Week 00	06 Feb - 12 Feb 2018	Intro & Review1	Ch. 1, 16
Week 01	13 Feb - 19 Feb 2018	Review2 & Scripting	Ch. 1, 2
Week 02	20 Feb - 26 Feb 2018	Protection, Security, Privacy, & C-language	Ch. 14, 15
Week 03	27 Feb - 05 Mar 2018	I/O, BIOS, Loader, & Systemd	Ch. 13
Week 04	06 Mar - 12 Mar 2018	Addressing, Shared Lib, & Pointer	Ch. 8
Week 05	13 Mar - 19 Mar 2018	Virtual Memory	Ch. 9
Reserved	20 Mar - 24 Mar 2018		
Mid-Term	26 Mar - 03 Apr 2018	(UTS)	
Week 06	05 Apr - 11 Apr 2018	Concurrency: Processes & Threads	Ch. 3, 4
Week 07	12 Apr - 18 Apr 2018	Synchronization	Ch. 5, 7
Week 08	19 Apr - 25 Apr 2018	Scheduling	Ch. 6
Week 09	26 Apr - 05 May 2018	File System & Persistent Storage	Ch. 10, 11, 12
Week 10	14 May - 19 May 2018	I/O Programming & Network Sockets Programming	
Reserved	22 May - 22 May 2018		
Final	23 May - 26 May 2018	(UAS)	
Deadline	07 Jun 2018 16:00	Extra assignment <b>deadline</b>	

## ● Operating Systems Check List

- ☐ Trace this document from <http://rms46.vlsm.org/2/207.html>
- ☐ Have a decent OS Book and map it to **OSC9**.
- ☐ Create **public** project "os181" on your github.com account.
  - ☐ Write in "README.md" file:
    - Special for Week 00: "**ZCZC Sistem Operasi 2018 Awal (1)**".
    - Add line on Week01: "**ZCZC W01 ...**".
    - On Week02: "**ZCZC W02 ...**".
    - On WeekXX: "**ZCZC WXX ...**".
- ☐ Encode your **QRC** with image size of approximately 250x250 pixels:  
"**OS181 CLASS ID GITHUB-ACCOUNT SSO-ACCOUNT SIAK-Full-Name**"  
Special for Week 00: Mail your **embedded** QRC to: os181@vlsm.org  
with Subject: [W00] CLASS ID SIAK-NAME.
- ☐ Write your Memo (with QRC) **every week**.
- ☐ Using your **SSO** account, login to badak.cs.ui.ac.id via kawung.cs.ui.ac.id.
  - ☐ Check folder badak:///extra/Week00/
  - ☐ Week00: Copy the folder to your home directory:  

```
cp -r /extra/Week00/W00-demos/ W00-demos/
```
  - ☐ For WeekXX: Copy the folder to your home directory:  

```
cp -r /extra/WeekXX/WXX-demos/ WXX-demos/ (XX=01, 02,... 10).
```
- ☐ **How to improve this document?**

# Agenda

- 1 Start
- 2 Agenda
- 3 How to contact the Lecturer
- 4 Goal
- 5 Assessment
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- 7 Resources
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- 9 Encoding and Decoding a QR Code
- 10 Memo Mingguan + QRC
- 11 Bahan-bahan
- 12 Accounts
- 13 Week 00: Review
- 14 Week 00: Problems
- 15 Week 00: Summary
- 16 Week 00: Check List
- 17 The End

# How to contact the Lecturer<sup>2</sup>

- Kontak/Tanya/Jawab WhatsApp Group **OS181**  
(info +62-881-456-XXXX)  
Email (Subject:[HELP]) os181@vlsm.org

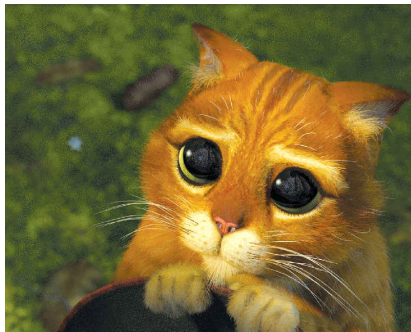


Figure: This is Puss in Boot<sup>1</sup>.

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<sup>1</sup>This is a fair use of a DreamWorks/Paramount Picture character.

<sup>2</sup>FYI: King Goerge II founded the University of Goettingen in 1734.

# Goal

## Coverage

This is an introduction to a modern operating systems course. It will cover general overview, computer architecture review, operating system overview, IPR, software licenses, GNU/Linux CLI, versioning, scripting, C language overview, protection, security, privacy, gnupg, startup process, I/O, addressing and pointers, memory management, processes and threads, virtual memory, synchronization, mutual exclusion, deadlock, CPU scheduling algorithms, file systems, and I/O programming.

## Student-Centered

This course is student-centered where responsibility is in the hands of the students. Students are expected to be prepared for the class meeting.

## GNU/Linux

Students will have a thorough understanding of how GNU/Linux provides services by using a Command Line Interface.

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85 - ... = A	80 - 85 = A-	75 - 80 = B+	70 - 75 = B
65 - 70 = B-	60 - 65 = C+	55 - 60 = C	50 - 55 = D or C <sup>1</sup>
40 - 50 = D	30 - 40 = E	20 - 30 = E	00 - 20 = E

---

- **4 SKS:** Alokasikan 12 jam per minggu.
- **No Lab — No Task — No Pop Quiz – No Teaching Assistant.**
- **Active Preparation / Participation / Q&A Only.**
  - Pre-Midterm (UTS): 6 weeks @ 3 points (=18%).
  - Post-Midterm: 5 weeks @ 3 points (=15%).
  - Points for answering questions, trying demos, and writings memos.
  - Deductions for **NOT** answering questions: individually or collectively.
- UTS: 6 set problems @ 6 points (=36%).
- UAS: 5 set problems @ 6 points (=30%).
- Extra untuk nilai C keatas: 1 point<sup>1</sup>.
- C-2C untuk nilai C-: upto 5 points<sup>1</sup>.

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<sup>1</sup>Syarat dan Ketentuan Berlaku

# Schedule pre MidTerm (UTS)

- Week00 – Intro & Review1 (OSC9-ch01<sup>1</sup> OSC9-ch16).
- Week01 – Review2 & Scripting (OSC9-ch01 OSC9-ch02 Scripting PLB-70 demo-w01<sup>2</sup>).
- Week02 – Protection, Security, Privacy, & C-language (OSC9-ch14 OSC9-ch15 demo-w02).
- Week03 – I/O, BIOS, Loader, & Systemd (OSC9-ch13 demo-w03).
- Week04 – Addressing, Shared Lib, & Pointer (OSC9-ch08 demo-w04).
- Week05 – Virtual Memory (OSC9-ch09 demo-w05).
- MidTerm (UTS) Week 00 — 05.

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<sup>1</sup>OSC9: Operating Systems Concepts (9<sup>th</sup> edition).

<sup>2</sup>Demo Files.



# Schedule post MidTerm (UTS)

- Week06 – Concurrency: Processes & Threads (OSC9-ch03 OSC9-ch04 demo-w06).
- Week07 – Synchronization (OSC9-ch05 OSC9-ch07 demo-w07).
- Week08 – Scheduling (OSC9-ch06 demo-w08).
- Week09 – File System & Persistent Storage (OSC9-10 OSC9-ch11-OSC9-ch12 demo-w09).
- Week10 – I/O Programming & Network Sockets Programming (demo-w10).
- Final (UAS) Week 06 — 10.

- Buku Sistem Operasi yang terbit dalam 10 tahun terakhir, umpama: (OSC9) Abraham Silberschatz, Peter B. Galvin, Greg Gagne: Operating System Concepts, 9<sup>th</sup> Edition, 2013.
- SUP — (ARSIP)(041\_Suplemen) Supplement.
- ETC — (ARSIP)(075\_ETC-Video) ETC
- (GITHUB) <https://github.com/UI-FASILKOM-OS/os181>
  - (DEMO) — demos/
  - (SLIDE) — pdf/ — <http://rms46.vlsm.org/2/207.html>
- (UJIAN) — <http://rms46.vlsm.org/2/195.pdf> - 205.pdf
- ARCHIVE (Arsip bahan pengajaran): <https://scele.cs.ui.ac.id/course/view.php?id=126>
  - **Enrollment key:** "11100010"<sup>1</sup>.
- (BADAK) — BADAK:///extra/

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<sup>1</sup>Kunci akan berubah secara berkala.

# Week 00: Self Service Assignments

- What is your class? A? B? C? D? E? I? M? X?
- Create project (**PUBLIC**) "os181" on your new (or existing) github.com account.
- Check your existing SSO Account (for using badak.cs.ui.ac.id).
- (Week 00) QRCode<sup>1</sup>: "OS181  
CLASS ID GITHUB-ACCOUNT SSO-ACCOUNT SIAK-Full-Name"
- (Weekly) Memo.
- Informasi Kuliah, Arsip Ujian, dan Demo
  - badak.cs.ui.ac.id/extra/
  - <https://github.com/UI-FASILKOM-OS/os181>
  - <https://rms46.vlsm.org/2/195.pdf> — [195.pdf - 205.pdf].
- Which BASH Account?
  - Virtual Ubuntu: badak.cs.ui.ac.id (SSO)
  - Ubuntu (BYOD)
  - WSL: Windows 10 Subsystem for Linux
  - Cygwin (Windows)

---

<sup>1</sup>"QR Code" is a registered trademark and wordmark of Denso Wave Inc.

# Encoding and Decoding a QR Code

```
# OS181:          OS 2018 1st term
# CLASS:          A, B, C, D (reg.), E (Extension), I (International),
#                M (Matriculation), X (ETC). Eg. "M".
# ID:             Student ID (NPM). Eg. "1253759225"
# GITHUB-ACCOUNT: Student's GITHUB account. Eg. "cbkadal"
# SSO-ACCOUNT:    Student's SSO account. Eg. "cicak123"
# SIAK-FULL-NAME: Student's SIAK name. Eg. "Cicak Bin Kadal"
```

```
$ qrencode "OS181 M 1253759225 cbkadal cicak123 Cicak Bin Kadal" \
-s 7 -o OS181-M-1253759225.png
```

```
$ zbarimg OS181-M-1253759225.png
```

```
QR-Code:OS181 M 1253759225 cbkadal cicak123 Cicak Bin Kadal
scanned 1 barcode symbols from 1 images in 0.11 seconds
```



Quick Response Code (QRC) Code  
Suggested size: 256 x 256 pixel.  
Check yours with a QRC reader app.

- (Week 00 **only**): Send QRC to [os181@vlsm.org](mailto:os181@vlsm.org)
  - Subject: [W00] CLASS ID SIAK-NAME
  - Example:
    - Mailto: [os181@vlsm.org](mailto:os181@vlsm.org)
    - Subject: [W00] M 1253759225 Cicak Bin Kadal
    - Insert your QR Code (**embedded**).
- Masalah Administratip
  - Harap menghubungi SEKRE (Ged. B lt. 2) untuk segala masalah administratip, terutama absen, sakit, surat sakit, ujian susulan, dst.
  - Harap merampungkan masalah administrasi ujian susulan dalam 6 hari kerja.

# Memo Mingguan + QRC

- **WAJIB:** mempersiapkan/mempelajari bahan kuliah minggu **setiap** terkait.
  - telah memahami garis besar bahan minggu terkait.
  - telah mempelajari jenis soal UTS/UAS yang pernah ditanyakan pada masa lalu.
- Telah mempersiapkan diri dengan membuat memo yang ada *QRC*.
  - Harap **TEST** apakah QRC terbaca dengan aplikasi QRC reader.
  - QRC memo akan di-*scan* di kelas pada saat istirahat kuliah pertama minggu terkait<sup>1</sup>.
  - tujuan pembuatan memo ialah sebagai "bukti" telah belajar.
  - ISI memo tidak dinilai!
  - Memo yang baik ialah MEMO yang bermanfaat untuk pembuatnya.
- Ujian:
  - Saat UTS dipersilakan membawa hingga 6 lembar memo ber QRC.
  - Saat UAS dipersilakan membawa hingga 5 lembar memo ber QRC.
  - Memo boleh yang pernah ditulis atau boleh juga membuat memo (ber QRC) yang baru.

---

<sup>1</sup>kecuali kuliah minggu 00.

# Week 00 Memo Example

[OS181][WEEK 00 01 02 03 04 05 06 07 08 09 10]

[http://rms46.vlsu.org/2/216.docx] [06FEB 13FEB 20FEB 27FEB 06MAR 13MAR 05APR 12APR 19APR 26APR 07MAY]

[CLASS: A B C D E I (M) X][ID: 1253759225][Name: Cicak Bin Kadal][Rev: 06]

$$\begin{aligned} |x, y| &\leq \|x\| \|y\| \\ \frac{d\vec{v}}{dt} &= \vec{a} \\ d\vec{v} &= \vec{a} dt \\ \int d\vec{v} &= \int \vec{a} dt \\ \vec{v} &= \vec{v}_0 + \vec{a}t \\ \frac{d\vec{x}}{dt} &= \vec{v} \\ \frac{d\vec{x}}{dt} \cdot (\vec{v}_0 + \vec{a}t) \\ d\vec{x} &= (\vec{v}_0 + \vec{a}t) dt \\ \int d\vec{x} &= \int (\vec{v}_0 + \vec{a}t) dt \\ \vec{x} &= \vec{x}_0 + \vec{v}_0 t + \frac{1}{2} \vec{a} t^2 \end{aligned}$$



$$\begin{aligned} \hat{H}|\psi_n(t)\rangle &= i\hbar \frac{\partial}{\partial t} |\psi_n(t)\rangle \\ \frac{1}{c^2} \frac{\partial^2 \phi_n}{\partial t^2} - \nabla^2 \phi_n + \left(\frac{mc}{\hbar}\right)^2 \phi_n &= 0 \\ \hbar \frac{\partial}{\partial t} s = S / \hbar \frac{\partial}{\partial t} s = p_i o s, i=1, \dots, k. \\ f(Q_1) &= \sum_{d=1}^{\infty} \frac{(2d-1)!}{(d!)^2} Q_1^d \\ d(x, z) &\leq d(x, y) + d(y, z) \end{aligned}$$

$$\begin{aligned} \frac{d\vec{v}}{dt} &= \vec{a} \\ d\vec{v} &= \vec{a} dt \\ \int d\vec{v} &= \int \vec{a} dt \\ \vec{v} &= \vec{v}_0 + \vec{a}t \\ \frac{d\vec{x}}{dt} &= \vec{v} \\ \frac{d\vec{x}}{dt} \cdot (\vec{v}_0 + \vec{a}t) \\ d\vec{x} &= (\vec{v}_0 + \vec{a}t) dt \\ \int d\vec{x} &= \int (\vec{v}_0 + \vec{a}t) dt \\ \vec{x} &= \vec{x}_0 + \vec{v}_0 t + \frac{1}{2} \vec{a} t^2 \end{aligned}$$

Figure: Memo: OS181 M 1253759225 cbkadal cicak123 Cicak Bin Kadal

# Bahan Presentasi:

<http://rms46.vlsm.org/2/207.html>

UI-FASILKOM-OS / **os181** Unwatch 1 Star 0 Fork 0

Code Issues 0 Pull requests 0 Projects 0 Wiki Insights Settings

Branch: master os181 / pdf Create new file Upload files Find file History

rms46 rmsbase pdf Latest commit 6ea3f4e 19 hours ago

..		
os00-181.pdf	rmsbase pdf	19 hours ago
os01-181.pdf	rmsbase pdf	19 hours ago
os02-181.pdf	rmsbase pdf	19 hours ago
os03-181.pdf	rmsbase pdf	19 hours ago
os04-181.pdf	rmsbase pdf	19 hours ago
os05-181.pdf	rmsbase pdf	19 hours ago
os06-181.pdf	rmsbase pdf	19 hours ago
os07-181.pdf	rmsbase pdf	19 hours ago
os08-181.pdf	rmsbase pdf	19 hours ago
os09-181.pdf	rmsbase pdf	19 hours ago
os10-181.pdf	rmsbase pdf	19 hours ago
osXX-181.pdf	rmsbase pdf	19 hours ago

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Figure: <https://github.com/UI-FASILKOM-OS/os181/tree/master/pdf>



# Bahan Demo

UI-FASILKOM-OS / **os181** Unwatch 1 Star 0 Fork 0

<> Code Issues 0 Pull requests 0 Projects 0 Wiki Insights Settings

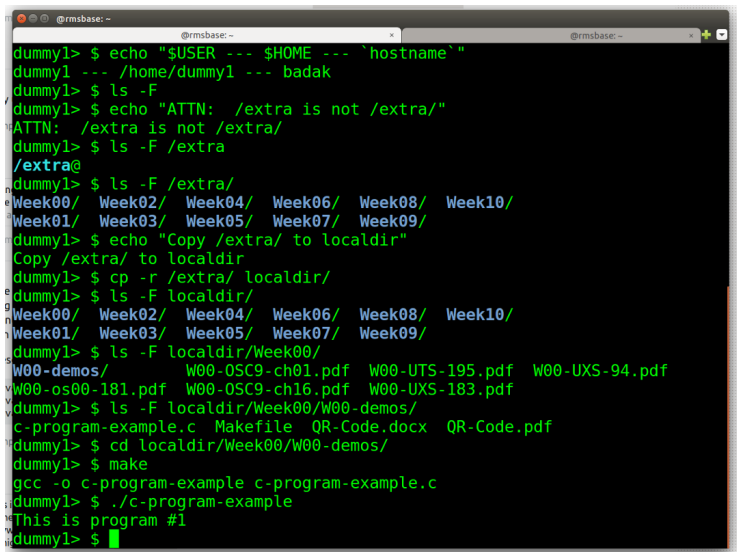
Branch: master os181 / demos / Create new file Upload files Find file History

**rms46** rmsbase Week00 Latest commit 2c3ee02 14 hours ago

..		
Week00	rmsbase Week00	14 hours ago
Week01	rmsbase demos	15 hours ago
Week02	rmsbase demos	15 hours ago
Week03	rmsbase demos	15 hours ago
Week04	rmsbase demos	15 hours ago
Week05	rmsbase demos	15 hours ago
Week06	rmsbase demos	15 hours ago
Week07	rmsbase demos	15 hours ago
Week08	rmsbase demos	15 hours ago
Week09	rmsbase demos	15 hours ago
Week10	rmsbase demos	15 hours ago

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Figure: <https://github.com/UI-FASILKOM-OS/os181/tree/master/demos>






```
@rmsbase: ~
dummy1> $ echo "$USER --- $HOME --- `hostname`"
dummy1 --- /home/dummy1 --- badak
dummy1> $ ls -F
dummy1> $ echo "ATTN: /extra is not /extra/"
ATTN: /extra is not /extra/
dummy1> $ ls -F /extra
/extra@
dummy1> $ ls -F /extra/
Week00/ Week02/ Week04/ Week06/ Week08/ Week10/
Week01/ Week03/ Week05/ Week07/ Week09/
dummy1> $ echo "Copy /extra/ to localdir"
Copy /extra/ to localdir
dummy1> $ cp -r /extra/ localdir/
dummy1> $ ls -F localdir/
Week00/ Week02/ Week04/ Week06/ Week08/ Week10/
Week01/ Week03/ Week05/ Week07/ Week09/
dummy1> $ ls -F localdir/Week00/
W00-demos/ W00-OSC9-ch01.pdf W00-UTS-195.pdf W00-UXS-94.pdf
W00-os00-181.pdf W00-OSC9-ch16.pdf W00-UXS-183.pdf
dummy1> $ ls -F localdir/Week00/W00-demos/
c-program-example.c Makefile QR-Code.docx QR-Code.pdf
dummy1> $ cd localdir/Week00/W00-demos/
dummy1> $ make
gcc -o c-program-example c-program-example.c
dummy1> $ ./c-program-example
This is program #1
dummy1> $
```

Figure: BADAK.cs.ui.ac.id:///extra/

My courses > LAIN-LAIN > Arsip RMS > General > ARSIP

 **Clock** 



 Server: Tue 9:56:21

 **Calendar** 

August 2017

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

**EVENTS KEY**

-  Hide global events
-  Hide course events

## ARSIP

- 010\_OS162
- 013\_DEMOS
- 015\_Video
- 017\_BAHAN-AJAR-LAMA
- 030\_Arsip-Ujian
- 040\_EXTRA-RMS
- 041\_Suplemen
- 050\_OSC-Silberschatz
- 060\_UJIAN-INTERNASIONAL
- 070\_KULIAH-INTERNASIONAL
- 075\_ETC-Video
- 080\_eDOCs
- 090\_KUNYUKS
- 100\_Infrastruktur\_IT\_Modern\_2012
- 110\_ITIM-REF
- 120\_ITIM-Video
- 200\_Pemrograman\_Sistem

Figure: Lihat juga [BADAK.cs.ui.ac.id:///extra/](http://BADAK.cs.ui.ac.id:///extra/)

# Github (New) Account 1

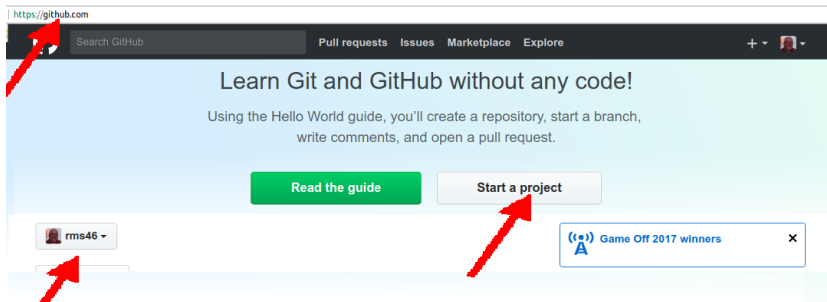


Figure: Start a new project by "rms46".

# Github (New) Account 2

## Create a new repository

A repository contains all the files for your project, including the revision history.

Owner

Repository name

 rms46 / os181 

Great repository names are short and memorable. Need inspiration? How about **verbose-garbanzo**.

Description (optional)

ZCZC Sistem Operasi 2018 Awal (1)

☒ Public

Anyone can see this repository. You choose who can commit.

☐ Private

You choose who can see and commit to this repository.

☒ Initialize this repository with a README

This will let you immediately clone the repository to your computer. Skip this step if you're importing an existing repository.

Add .gitignore: **C** Add a license: **None** 

Create repository

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Figure: Create public repository "os181" with a README.md file

# Github (New) Account 3

The screenshot shows the GitHub interface for a public repository named 'os181' by user 'rms46'. At the top, the repository name is displayed with navigation links for Code, Issues (0), Pull requests (0), Projects (0), Wiki, Insights, and Settings. On the right, there are buttons for Unwatch (1), Star (0), and Fork (0). Below this, the repository description 'ZCZC Sistem Operasi 2018 Awal (1)' is shown with an 'Add topics' link and an 'Edit' button. A summary bar indicates 1 commit, 1 branch, 0 releases, and 1 contributor. Below this is a section for the 'master' branch with a 'New pull request' button and a list of actions: 'Create new file', 'Upload files', 'Find file', and 'Clone or download'. The commit history shows two entries: '.gitignore' and 'README.md', both as initial commits by 'rms46' 'just now'. At the bottom, the 'README.md' file content is visible, showing the repository name 'os181' and its description 'ZCZC Sistem Operasi 2018 Awal (1)'.

rms46 / os181

Unwatch 1 Star 0 Fork 0

Code Issues 0 Pull requests 0 Projects 0 Wiki Insights Settings

ZCZC Sistem Operasi 2018 Awal (1) Edit

Add topics

1 commit 1 branch 0 releases 1 contributor

Branch: master New pull request

Create new file Upload files Find file Clone or download

rms46 Initial commit Latest commit 8fa42bd just now

.gitignore	Initial commit	just now
README.md	Initial commit	just now

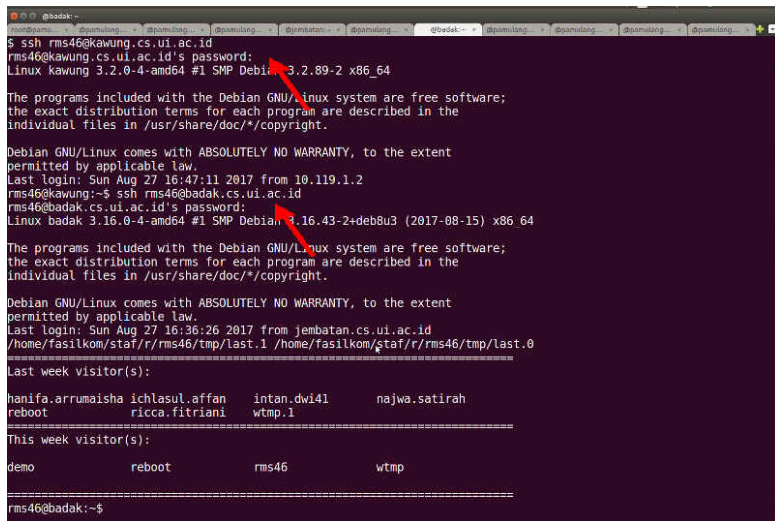
README.md

## os181

ZCZC Sistem Operasi 2018 Awal (1)

Figure: Public project "os181" by "rms46" at <https://github.com/rms46/os181>

# Login: Badak via Kawung



```
@badak:~  
$ ssh rms46@kawung.cs.ui.ac.id  
rms46@kawung.cs.ui.ac.id's password:  
Linux kawung 3.2.0-4-amd64 #1 SMP Debian 3.2.89-2 x86_64  
  
The programs included with the Debian GNU/Linux system are free software;  
the exact distribution terms for each program are described in the  
individual files in /usr/share/doc/*/copyright.  
  
Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent  
permitted by applicable law.  
Last login: Sun Aug 27 16:47:11 2017 from 10.119.1.2  
rms46@kawung:~$ ssh rms46@badak.cs.ui.ac.id  
rms46@badak.cs.ui.ac.id's password:  
Linux badak 3.16.0-4-amd64 #1 SMP Debian 3.16.43-2+deb8u3 (2017-08-15) x86_64  
  
The programs included with the Debian GNU/Linux system are free software;  
the exact distribution terms for each program are described in the  
individual files in /usr/share/doc/*/copyright.  
  
Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent  
permitted by applicable law.  
Last login: Sun Aug 27 16:36:26 2017 from jembatan.cs.ui.ac.id  
/home/fasilkom/staf/r/rms46/tmp/last.1 /home/fasilkom/staf/r/rms46/tmp/last.0  
Last week visitor(s):  
hanifa.arrumaisha  ichlasul.affan      intan.dwi41      najwa.satirah  
reboot            ricca.fitriani    wtmp.1  
=====
```

This week visitor(s):			
demo	reboot	rms46	wtmp

```
=====
```

```
rms46@badak:~$
```

Figure: Login: Badak via Kawung

# WSL: Windows Subsystem for Linux

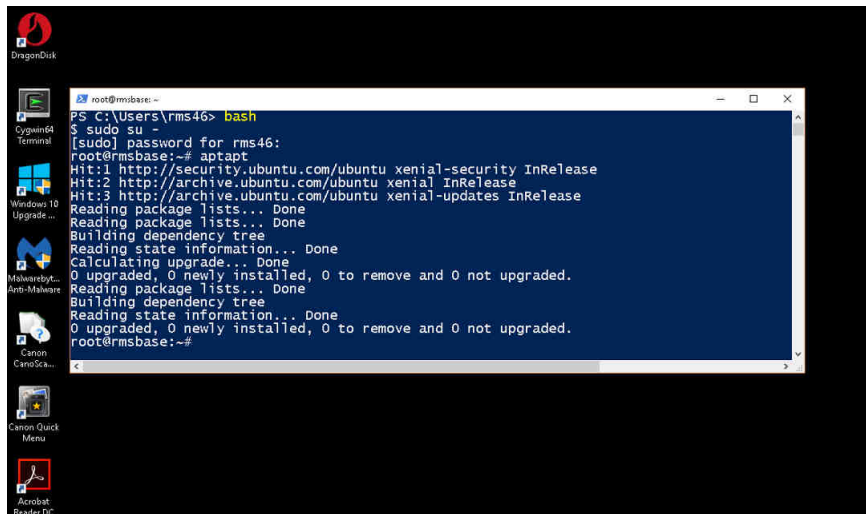
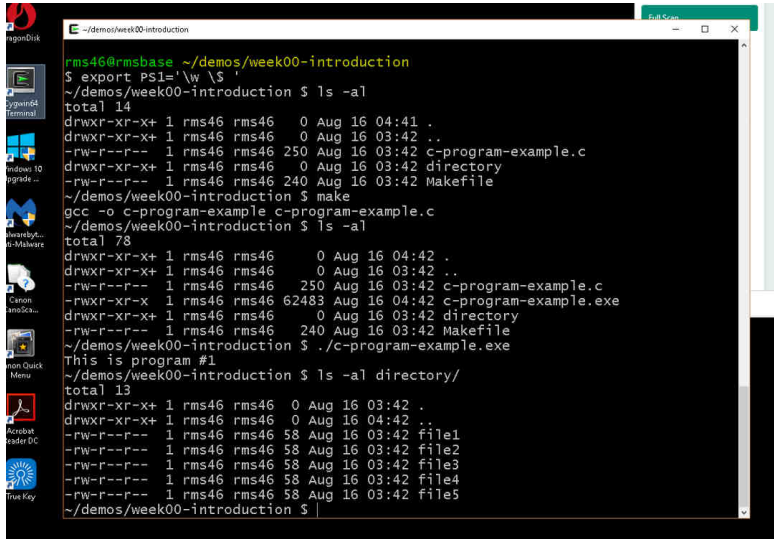


Figure: WSL: Windows Subsystem for Linux





```
~/demos/week00-introduction
rms46@rmsbase ~/demos/week00-introduction
$ export PS1='\w \$ '
~/demos/week00-introduction $ ls -al
total 14
drwxr-xr-x+ 1 rms46 rms46  0 Aug 16 04:41 .
drwxr-xr-x+ 1 rms46 rms46  0 Aug 16 03:42 ..
-rw-r--r-- 1 rms46 rms46 250 Aug 16 03:42 c-program-example.c
drwxr-xr-x+ 1 rms46 rms46  0 Aug 16 03:42 directory
-rw-r--r-- 1 rms46 rms46 240 Aug 16 03:42 Makefile
~/demos/week00-introduction $ make
gcc -o c-program-example c-program-example.c
~/demos/week00-introduction $ ls -al
total 78
drwxr-xr-x+ 1 rms46 rms46  0 Aug 16 04:42 .
drwxr-xr-x+ 1 rms46 rms46  0 Aug 16 03:42 ..
-rw-r--r-- 1 rms46 rms46 250 Aug 16 03:42 c-program-example.c
-rwxr-xr-x 1 rms46 rms46 62483 Aug 16 04:42 c-program-example.exe
drwxr-xr-x+ 1 rms46 rms46  0 Aug 16 03:42 directory
-rw-r--r-- 1 rms46 rms46 240 Aug 16 03:42 Makefile
~/demos/week00-introduction $ ./c-program-example.exe
This is program #1
~/demos/week00-introduction $ ls -al directory/
total 13
drwxr-xr-x+ 1 rms46 rms46  0 Aug 16 03:42 .
drwxr-xr-x+ 1 rms46 rms46  0 Aug 16 04:42 ..
-rw-r--r-- 1 rms46 rms46 58 Aug 16 03:42 file1
-rw-r--r-- 1 rms46 rms46 58 Aug 16 03:42 file2
-rw-r--r-- 1 rms46 rms46 58 Aug 16 03:42 file3
-rw-r--r-- 1 rms46 rms46 58 Aug 16 03:42 file4
-rw-r--r-- 1 rms46 rms46 58 Aug 16 03:42 file5
~/demos/week00-introduction $
```

Figure: Cygwin

# Program Example (Week 00)

```
$ cat c-program-example.c
/* (c) 2016-2017 Rahmat M. Samik-Ibrhaim
 * REV01 Sun Aug 20 15:01:12 WIB 2017
 * START Fri Jan 01 00:00:00 WIB 2016
 * This is a free software.
 * To compile:
 * $ gcc -o c-program-example c-program-example.c
 * To execute:
 * $ ./c-program-example
 */
```

```
#include <stdio.h>
```

```
void main() {
    printf("This is program #1\n");
}
```

# Makefile

```
$ cat Makefile
```

```
# (c) 2016-2017 Rahmat M. Samik-Ibrahim  
# REV01 Tue Aug 22 14:45:14 WIB 2017  
# START Fri Jan 01 00:00:00 WIB 2016  
# This is a free Makefile configuration.  
# Just run:  
# % make
```

```
ALL:  c-program-example
```

```
c-program-example: c-program-example.c  
    gcc -o c-program-example c-program-example.c
```

```
clean:  
    rm -f c-program-example
```

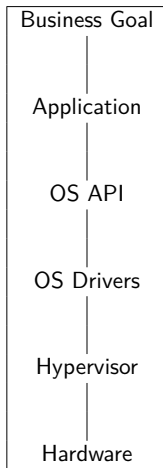
# Week 00: Demo Directory

```
$ ls -al
total 44
drwxr-xr-x  3 rms46 rms46  4096 Aug 28 18:45 .
drwxr-xr-x 13 rms46 rms46  4096 Feb 28 18:50 ..
-rw-r--r--  1 rms46 rms46   334 Aug 23 20:17 c-program-example.c
-rw-r--r--  1 rms46 rms46   319 Aug 23 20:17 Makefile
-rw-r--r--  1 rms46 rms46 23606 Aug 28 18:26
QuickResponseCode.docx
```

```
$ make
gcc -o c-program-example c-program-example.c
$ ./c-program-example
This is program #1
$ ls -al
total 56
.....
$ make clean
rm -f c-program-example
$
```

# Week 00: Review

- What is an Operating System?
- Why taking an Operating System class?



# Computer Organization Review

- You should understand:
  - von Neumann Model.
  - Buses, Bridges, Transfer Rate, Clock.
  - Memory: DDR, DDR-2, ...
  - Cache, Buffer, Spool.
  - Direct Memory Access (DMA).
  - Port & Memory Mapped I/O.
  - CPU: privilege/kernel/supervisor mode and user mode.
  - Hardware Limitation.
  - Priority: Read vs Write.
  - Interrupts: Polling & Vectored.
  - Multiprocessors: Symmetric vs. Asymmetric.
  - Multicore & Multithreading.
  - Clustered Systems.
  - Numbers: base 2, base 8, base 10, base 16.
    - Base 2:  $110010101010_2$
    - Base 8:  $01234567_8 = 000\ 001\ 010\ 011\ 100\ 101\ 110\ 111_2$
    - Base 10:  $012\ 345\ 679$
    - Base 16:  $9AB\ CDEF_{16} = 1001\ 1010\ 1011\ 1100\ 1101\ 1110\ 1111_2$

# Block Diagram

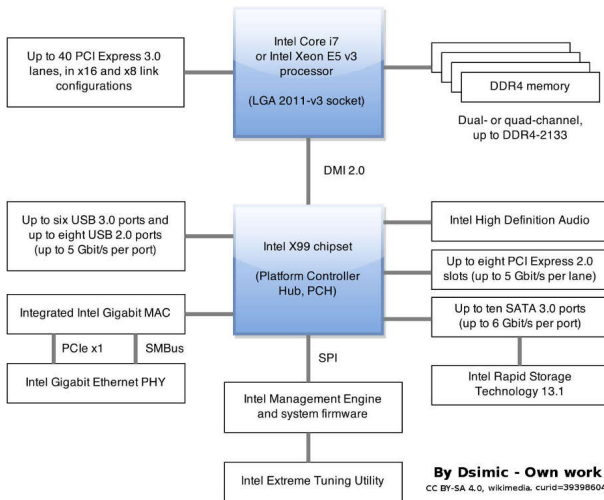


Figure: Block Diagram

# APIC (Advanced Programmable Interrupt Controller)



Figure: APIC (Advanced Programmable Interrupt Controller)



# Interrupt Handling



(c) 2017 VauLSMorg – This is a free picture

**Figure:** Interrupt Handling with PIC (Programmable Interrupt Controller)

# Managers Set

- Process:
  - Creating/Deleting; Suspending/Resuming; Synchronization; Communication; Scheduling
- Memory:
  - Tracking; Move In/Move Out; Allocating/Deallocating.
- Storage/File System:
  - Create/Delete; Open/Close; Read/Write.
- Mass Storage:
  - Scheduling; Allocating; Free Space.
- I/O:
  - Buffering; Caching; Spooling.
  - Interfacing (driving).
- Protecting & Security:
  - Protecting.
  - Security.

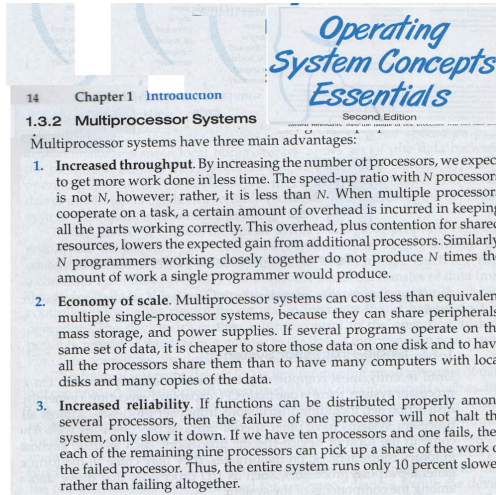


Figure: T / F The advantages of a multiprocessor system include: increased throughput, economy of scale, and increased reliability.

# Week 00: Problems

- Tugas Minggu 00 (Week 00) ada dua:
  - membuat QRC dan mengirimkannya via email.
  - membuat Memo Minggu 00 yang ada QRC, serta ditunjukkan pada saat istirahat kuliah hari ke dua.
- "TANDA PETIK" BUKAN merupakan bagian dari QRC!
- Jangan mencantumkan ".git" dan ".sso", jika bukan bagian dari nama akun anda!
- Tanpa header [W00] pada Subject; email anda mungkin akan nyasar entah kemana... Ingat: [W00] (We-Nol-Nol) tidak sama dengan [WOO] (We-O-O)!
- Ukuran QRC cukup sekitar 256 x 256 pixel: jangan terlalu besar atau terlalu kecil.
- QRC ditanam (embedded) dalam email; jangan menggunakan attachment!
- Jangan mengirim MEMO dalam format PDF!

- Reference: (OSC9 chapter 1 + chapter 16)
- What is an Operating Systems?
  - Definition: Resource Allocator & Control Program.
  - Why taking an Operating System class?
- Computer Organization Review
- The Manager Set
  - Process Manager, Memory Manager, I/O Manager, Storage Manager.
- Protection and Security
- Virtualization
  - Hypervisor type 0, 1, 2
  - Paravirtualization, Emulators, Containers.

# Week 00: Check List

- ☐ Find/copy this document from  
`http://rms46.vlsm.org/2/207.html`
- ☐ Find/read a recent OS Book and map it to OSC9.
- ☐ Using your **SSO** account, login to `badak.cs.ui.ac.id` via `kawung.cs.ui.ac.id`.
- ☐ Check folder `badak:///extra/Week00/`
  - ☐ Try to copy and compile `c-program-example.c`.
- ☐ Create **public** project "os181" on your new (or existing) `github.com` account.
- ☐ Write in "README.md" file:  
"ZCZC Sistem Operasi 2018 Awal (1)"
- ☐ Encode your QRC.
- ☐ Mailto: `os181@vlsm.org` (Subject: [W00] CLASS ID SIAK-NAME)
- ☐ Write "Memo Week00" + your QRC.
- ☐ **How to improve this document?**

# The End

- ☐ This is the end of the presentation.
- ☒ This is the end of the presentation.
  - This is the end of the presentation.