NETWORK PROGRAMMING MIDTERM HACKATHON

CSE 3233 & CSE 4119 CLASSES

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MidTerm-Hackathon EXAM RULES

1. **Hackathon stars at 13:00 am and ends at 15:00 am. (Additional time may be added)**
2. ***You have to bring your laptop with you (Linux OS and C/C++ should be ready). If you have no laptop, you can use our department's lab (but you have to prepare the computer ready for Hackathon) If you live any trouble, you have to solve it in your time slot***.)
   (Alternatively, You can also bring External USB with ready OS and C/C++ installed)
3. This sheet shares Hackathon Questions which you must solve yourself.
(Team establishment is not allowed)
4. **The Hackathon is divided in to two Sessions;**
   Session 1: is going to be held in 5 December 2023-[13:00-15:00] (Today)
   In this Session 1, you are expected to develop the code from the first line to the last line. At the end of the Session 1, you have to submit your code on Teams platform.

   Session 2: is going to be held in 10 Dec 2023-[22:00] – 11 Dec 2023 [23:50]
   In this Session 2, you are expected to upload detailed Report in a two-columned paper format. In this report, you should explain the code developed in Session 1.

5. In Session 1, chatting with your classmates are not allowed.
6. In Session 1, **NO** !! **LIBRARY USAGE (Ready packages that do all actions needed)** is allowed. You should develop your code based on TextBook Codes (Jhon Shapley Gray's IPC in Linux book)
7. In Session 1, **UNKNOWN Methods** (that you have not learned in our -M.Erdem's- CNP Course) are **NOT** !! allowed
8. In Session 1, code exchange is not allowed. You should develop the code yourself.
9. In Session 1, Help from Internet search/Chat GPT usage/Automatic Code Generating tools are free to use. In other words, "your own search to solve your problem" is supported.
10. All answers must be coded by single student. Otherwise it is not accepted.
11. The completed codes should be uploaded on Teams Platform (Session 1).
12. The completed reports should be uploaded on Teams Platform (Session2).

DECEMBER 5, 2023

COMPUTER ENGINEERING DEPARTMENT
MANİSA CELAL BAYAR ÜNİVERSİTESİ

SESSION 1 – 5 December 2023 [%60 of MidTerm]

PROBLEM: MULTIPLE Clients Check "Updates of Their Installed Applications" on the Server. If the application is up_to_date no action needed. if it is not, download link is given to the client.

Materials - Phase 1 [20/100]:

a) Lists on Client and Server Side

- We suppose to have a list of installed Applications on Client side. This list is something like;
  - Program ID: 19, Program Version:2, Program Name: CinsCalculator
  - Program ID: 43, Program Version:12, Program Name: CinsBrowser
  - Program ID: 9, Program Version:3.2, Program Name: CinsAntivirus
  - ….
- This installed Applications list on Client side should be ready on your environment (prepared manually).

- We suppose to have a list of "new updates available list" on Server side. This list something like;
  - Program ID: 43, Program Version:12, Program Name: CinsBrowser, Download URL:.....
  - Program ID: 9, Program Version:3.6, Program Name: CinsAntivirus, Download URL:.....
  - Program ID: 19, Program Version:3, Program Name: CinsCalculator, Download URL…..
  - ….
- This new Updates list on Server side should be ready on your environment (prepared manually).

Since we are entering each record at the end of lists, BOTH type (Client side and Server Side lists) are not sorted.

b) InterProcess Communication Base

- Message Queue is used for messaging. (Clients and Server uses it IPS as general communication channel)
- Shared Memories are used for Download URLsharing.(Client-Server uses it as a private communication channel)

[YOU SHOULD DESIGN MESSAGE STRUCTUREs and SharedMem CONTENT Structures]

Client Side Code Phase 2 [40/100]:

- Client is responsible to send a message to Server including its existing (PrgID, PrgVer, PrgName) application information. The aim is "to check new update is available or not ?"
  - If Client receives "no need to update" than do nothing (Write on screen, "ProgramID/Ver/Name is uptodate").
  - If Client receives "download from private channel", using the message (private SharedMem ID) Client reads the download link and removes the SharedMem from OS. (Write on screen "ProgramID/Ver/Name is updated at date/time:……")

Server Side Code Phase 3 [40/100]:

- Server is responsible to check whether Client's application should be updated ? or not…
  - If Client's application is up-to-date, Server sends a message to Client "no-need to update"
  - If Client's application is old one,
    - Server creates a temporary sharedmem private channel. Puts download link in the sharedmem.
    - Server sends a message "download from private channel" to Client including SharedMem ID

➔ All download URLs/application informations are virtual (not real). This Hackathon is for just a demo purpose. (Infact, this is the base demo for Operating systems "software updating" processes)

SESSION 2 – 10/11 December 2023 [%40 of MidTerm]

Report Phase:

- Prepare Report in a two-column academic paper (take reference format from IEEE Transaction Journals)
- Report should include; Intro to Problem, Methodology, Discussion about problem (alternatives ?, corrections ? etc.), Conclusion with future advises
- Code (submitted on 5 December 2023) can be corrected but the grades about Session 1 is not modified.

Table: Indicating the Course's Learning Outcomes and Learning Outcomes Components with Questions

CSE 3233	PÇB1	PÇB2	PÇB3	PÇB4	PÇB5	PÇB6	PÇB7	PÇB8	PÇB9	PÇB10	PÇB11	PÇB12	PÇB13	PÇB14	PÇB15	PÇB16	PÇB17	PÇB18	PÇB19	PÇB20	PÇB21	PÇB22	PÇB23	PÇB24	PÇB25	PÇB26	PÇB27	PÇB28
NetProg Course PÇB		✓		✓	✓		✓	✓	✓	✓							✓						✓					
Materials Phase 1	+																											
CS Code Phase 2																												
SS Code Phase 3																												
Report Phase																												

MÜDEK – Course Learning OutComes and Components

CSE 3233	PÇB1	PÇB2	PÇB3	PÇB4	PÇB5	PÇB6	PÇB7	PÇB8	PÇB9	PÇB10	PÇB11	PÇB12	PÇB13	PÇB14	PÇB15	PÇB16	PÇB17	PÇB18	PÇB19	PÇB20	PÇB21	PÇB22	PÇB23	PÇB24	PÇB25	PÇB26	PÇB27	PÇB28
Computer Network Programming		x		x	x		x	x	x	x							x						x					

PÇ1 Matematik, fen bilimleri ve ilgili mühendislik disiplinine özgü konularda yeterli bilgi birikimi; bu alanlardaki kuramsal ve uygulamalı bilgileri, karmaşık mühendislik problemlerinde kullanabilme becerisi.

PÇB1
PÇB2 Bu alanlardaki kuramsal ve uygulamalı bilgileri, karmaşık mühendislik problemlerinin çözümünde kullanabilme becerisi

PÇ2 Karmaşık mühendislik problemlerini tanımlama, formüle etme ve çözme becerisi; bu amaçla uygun analiz ve modelleme yöntemlerini seçme ve uygulama becerisi.

PÇB3
PÇB4 Bu amaçla uygun analiz ve modelleme yöntemlerini seçme ve uygulama becerisi.

PÇ3 Karmaşık bir sistemi, süreci, cihazı veya ürünü gerçekçi kısıtlar ve koşullar altında, belirli gereksinimleri karşılayacak şekilde tasarlama becerisi; bu amaçla modern tasarım yöntemlerini uygulama becerisi.

PÇB5 Karmaşık bir sistemi, süreci, cihazı veya ürünü gerçekçi kısıtlar ve koşullar altında, belirli gereksinimleri karşılayacak şekilde tasarlama becerisi;
PÇB6

PÇ4 Mühendislik uygulamalarında karşılaşılan karmaşık problemlerin analizi ve çözümü için gerekli olan modern teknik ve araçları seçme ve kullanma becerisi; bilişim teknolojilerini etkin bir şekilde kullanma becerisi.

PÇB7 Mühendislik uygulamalarında karşılaşılan karmaşık problemlerin analizi ve çözümü için gerekli olan modern teknik ve araçları seçme ve kullanma becerisi;
PÇB8 Bilişim teknolojilerini etkin bir şekilde kullanma becerisi

PÇ5 Karmaşık mühendislik problemlerinin veya disipline özgü araştırma konularının incelenmesi için deney tasarlama, deney yapma, veri toplama, sonuçları analiz etme ve yorumlama becerisi.

PÇB9 Karmaşık mühendislik problemlerinin veya disipline özgü araştırma konularının incelenmesi için deney tasarlama becerisi
PÇB10 Deney yapma, veri toplama, sonuçlarını analiz etme ve yorumlama becerisi.

PÇ7 Türkçe sözlü ve yazılı etkin iletişim kurma becerisi; en az bir yabancı dil bilgisi; etkin rapor yazma ve yazılı raporları anlama, tasarım ve üretim raporları hazırlayabilme, etkin sunum yapabilme, açık ve anlaşılır talimat verme ve alma becerisi.

PÇB14
PÇB15
PÇB16
PÇB17 Tasarım ve üretim raporları hazırlayabilme becerisi
PÇB18
PÇB19

PÇ9 Etik ilkelerine uygun davranma, mesleki ve etik sorumluluk ve mühendislik uygulamalarında kullanılan standartlar hakkında bilgi.

PÇB22
PÇB23 Mühendislik uygulamalarında kullanılan standartlar hakkında bilgi.