



# COMP 3511

## Operating Systems



Project #1

# Objectives and Tasks

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- Familiarizing with Nachos system
- Running Nachos
- Creating threads in Nachos
- Simple thread scheduling in Nachos

# Task 1

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- **Task 1: Running Nachos with pre-implemented semaphore**
  - **Step 1:** download Nachos source code, with pre-implemented semaphore
  - **Step 2:** Extract the source code
  - **Step 3:** Compile the code
  - **Step 4:** Run nachos
  - **Step 5:** Save the output to file `project1_output1.txt`
- In this program, Nachos creates “Thread1”
  - Announcing its name and termination

# Task 2

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- **Task 2: Adding codes to Nachos**
- Four functions in project1.cc:
  - running\_for\_calculation()
  - latter\_thread()
  - prior\_thread()
  - project1()
- In this task, you are required to modify **prior\_thread()** and **project1()**

# Task 2

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## ■ Basic Steps

- **Step 1:** Invoking function `running_for_calculation()` in Thread 1, i.e. function `prior_thread()`
- **Step 2:** Creating second thread called Thread2, which invokes function `latter_thread ()`
- **Step 3:** Re-run "make" and "./nachos"
- **Step 4:** Save the output to file `project1_output2.txt`

## ■ Output Requirements

- Print the name of Thread1 and Thread2
- Print the information claiming that thread1 is going to perform calculation for certain times
- Thread1 ends before Thread2

# Task 3

## ■ Task 3: Simple Thread Scheduling in Nachos

### ■ Basic Steps

- **Step 1:** Add four code lines in source file `project1.cc`
- **Step 2:** Rebuild the project and re-run “nachos”
- **Step 3:** Save the output to file `project1_output3.txt`
- **Step 4:** Comment out two lines and add another two lines for scheduling threads in a different order
- **Step 5:** Rebuild the project and save the output to file `project1_output4.txt`
- **Step 6:** Compare the outputs of task 3

### ■ Hint:

- Analyze the functionality of `Suspend()` and `Resume()`

# Outputs

- Please generate a single file using **ZIP** and submit it through CASS
- Name of the ZIP: "proj1\_\*\*\*\*\*.zip" (\* as student ID)
- Inside the ZIP file:

File Name	Description
project1.cc	Source file you have accomplished by the end of Task 3
project1_output1.txt	Output of Task 1
project1_output2.txt	Output of Task 2
project1_output3.txt	The first output of Task 3
project1_output4.txt	The second output of Task 3
project1_report.txt	The answer to the question in Step 6 of Task 3