# **Report Template: Thread Pool Implementation**

**Student Name:**

**Group:**

**Chosen Variant:**

**Github Link:**

### **Task**

*Brief description of the task assigned*

### **System Model**

**Insert a photo or screenshot of the system model here:** *(Provide a diagram or code structure that represents the thread pool system, showing how threads interact with the task queue and handle synchronization.)*

### **Solution Description**

**Provide a description of the implemented software solution, explaining how the system was designed and developed:** *(Describe how you implemented the thread pool, mentioning any specific synchronization techniques used, such as mutexes and conditional variables. Detail how tasks are added, managed, and executed within the pool.)*

### **Testing**

* **Describe how the testing was conducted:** *(Explain how you tested the thread pool's functionality, including task addition, execution, and safe shutdown. Mention any specific tests you performed to ensure thread safety and the correct handling of synchronization primitives.)*
* **Performance Evaluation:** *(Perform time-limited testing to monitor and record the number of threads created and the average time a thread spends in the waiting state. Evaluate the performance of your thread pool by determining the average length of each queue and the average task execution time for unlimited queues, or ascertain the maximum and minimum times until a queue is filled and the number of rejected tasks for limited queues.)*
* **Insert screenshots of the program during testing:** *(Show the console input/output that verifies the thread pool's behavior under various scenarios, like loading tasks, pausing, and stopping the pool.)*

### **Conclusions**

* **What was implemented:** *(Summarize the functionalities implemented in the thread pool, emphasizing synchronization and parallelism aspects.)*
* **Differences from the proposed model:** *(Discuss any deviations from the initial design and the reasons behind these changes.)*
* **Additional Notes:** *(Include any challenges faced during the development and testing phases, and how you addressed them.)*

### **Appendices**

**Add any extra materials here, such as additional diagrams or resources used:** *(This section can include additional test results or references to articles or documentation that influenced your design decisions.)*