National University of Computer & Emerging Sciences Karachi Campus

Ice-cream Factory Problem System call

Project Report
Operating System
Section: H (J)

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1 Introduction

This project is dedicated to creating a system call that deals with the ice-cream factory problem. A system call is a request for a service that is made by the application programs to the operating system; these can be either user system call (without kernel intervention) or kernel system call (with kernel intervention).

2 Project Specification

Software Specs:

Main function deals with the creation, and deletion of threads, and semaphores.
Ice function simulates the ice-cream factory while handling the race condition. Two functions flav, and topping deal with the race condition of flavours, and toppings availability.

Tools, and Technologies:

Programming Language: C language
Platform: Ubuntu 18.04

3 Problem Analysis

Problem: How to handle customers, flavours, and toppings so that no race condition occurs?

Input: Semaphore addresses.
Process: Use semaphore wait, and post to avoid multiple writes, and reads at a time.

4 Solution Design

Ice function uses semaphore wait, and post for decrementing no. of customers. Semaphore wait before entering flav or toppings function and post after returning.

Flav, and topping function use semaphore wait to decrement the values of flavours and toppings.

Ice-cream factory simulated by using random values for choice in flavours and toppings.

5 Project Breakdown

Ice-cream Factory Problem solving program will be built, and managed by *Abdul Raffay Syed*, and results will be submitted till 8th of May.

System call will be configured in Kernel by *Syed Jari Sajjad*, and results will be delivered till 10th of May.

Report for the ice-cream factory problem will be built on LaTex, and Kernel configuration will be majorly lead by *S.M.Bilal B. Arshad*, and results will be delivered till 10th of May.

6 Results

The end result of team efforts is a system call that deals with the ice-cream factory problem. This system call is essentially free of race condition, and is a demonstration of how the operating system avoids race condition in the vast amount of processes.

7 Acknowledgement

We would like to acknowledge the following GitHub repository that helped us in understanding the problem better. Link to repo.