

# Homework 4 Report

Concurrent programming, ID1217

## Group members

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## Task 5: The Hungry Birds Problem(one producer - multiple consumers)

### Implementation

This problem consists of a parent bird (producer) and multiple baby birds (consumers) sharing a bowl of worms. The baby bird eats worms from the bowl all the time. When the bowl is empty, the baby bird who realizes this condition wakes up the parent bird, who refills the bowl.

- Baby Birds (Consumers) eat worms one at a time from the shared bowl.
- Mutual Exclusion via synchronized blocks.
- The parent bird (Producer) refills the bowl with worms when it is empty.

### Results

Ouptut of the program using 3 birds

```
bird 1 eats a worm,bowl has 9 worms left
bird 2 eats a worm,bowl has 8 worms left
bird 3 eats a worm,bowl has 7 worms left
bird 1 eats a worm,bowl has 6 worms left
bird 3 eats a worm,bowl has 5 worms left
bird 2 eats a worm,bowl has 4 worms left
bird 1 eats a worm,bowl has 3 worms left
bird 1 eats a worm,bowl has 2 worms left
bird 2 eats a worm,bowl has 1 worms left
bird 3 eats a worm,bowl has 0 worms left
parent bird refills the bowl with 10 worms
```

## Task 6: The Bear and Honeybees Problem(multiple producers - one consumer)

### Implementation

This problem involves a number of honeybees (producers) that add honey to a shared pot and a bear (consumer) that eats all the honey once the pot is full. The bear sleeps as it waits for the pot to be filled and wakes up to eat the honey.

- Honeybees (Producers) add honey to the pot one portion at a time.
- Mutual Exclusion via synchronized block.
- The bear (Consumer) sleeps until the pot is full, then wakes up and eats all the honey.

## Results

Output using 5 honeybees and honey pot having a capacity of 4

```
honeybee 1 added honey, pot now has 1 portions.  
honeybee 5 added honey, pot now has 2 portions.  
honeybee 4 added honey, pot now has 3 portions.  
honeybee 2 added honey, pot now has 4 portions.  
Pot reached its capacity, honeybee 2 is waking up the bear!  
bear wakes up, eats all honey.  
bear goes back to sleep.  
honeybee 3 added honey, pot now has 1 portions.  
honeybee 5 added honey, pot now has 2 portions.  
honeybee 4 added honey, pot now has 3 portions.  
honeybee 4 added honey, pot now has 4 portions.  
Pot reached its capacity, honeybee 4 is waking up the bear!  
bear wakes up, eats all honey.  
bear goes back to sleep.
```