Assignment 9: CSP

ETH Zurich

1 Moving objects

1.1 Background

This task has been adapted from [1]. An object starts on the ground, and may move up. At
any time thereafter it may move up and down, except that when on the ground it cannot move
any further down. But when it is on the ground, it may move around. Let $n$ range over the
natural numbers $0, 1, 2, \ldots$.

1.2 Task

For each $n$, introduce the process $CT_n$ to describe the behaviour of the object when it is $n$
moves off the ground.

2 Barriers and Workers

2.1 Background

In this task, we focus on worker-processes. The definition for a worker is a process that con-
tinually: joins a barrier with a tagged announcement, then leaves the barrier, then does some
work. This can be given as a CSP process, $M_i = join_i \rightarrow leave \rightarrow work \rightarrow M_i$.

2.2 Task

1. Give a process with two workers composed together such that the workers can join the
same barrier whenever they wish, but must leave together before independently doing their
work.

2. Simplify the process from the above task (you can stop when you see a non-deterministic
internal choice operator).

3. Give a process which has two teams of two workers. The teams must all synchronize to
the same barrier, the members of the team must work together, but different teams work
independently.

References