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Subject: BAI

Experiment No. 3

Water Jug Problem

Question:

You are given two jugs with capacities jug1Capacity and jug2Capacity litres. There is an infinite amount of water supply available. Determine whether it is possible to measure exactly target Capacity litres using these two jugs.

If target Capacity litres of water are measurable, you must
have target Capacity litres of water contained within one or both buckets by the end.

C++ code:

```
bool canMeasureWater (int jug1Capacity, int jug2Capacity, int targetCapacity)
{

queue<int> q;
q.push(jug1Capacity);
q.push(jug2Capacity);
unordered_set<int> s;
while(!q.empty()){
int cur=q.front();
q.pop();
if(cur==targetCapacity || cur+jug1Capacity==targetCapacity ||
cur+jug2Capacity==targetCapacity)
return true;
if(s.count(cur))
continue;
s.insert(cur);
q.push(abs(jug1Capacity-cur));
q.push(abs(jug2Capacity-cur));
}
return false;
}
```

The above function outputs a Boolean value that is either the given target value can be achieved or not by adding or subtracting the jar values that is their capacities. We used a queue to store all the possible values in a jar