# Cutting Rope

There are many pieces of thin rope of varying lengths each tied at one end to a rod. You place the rod and ropes onto a cutting table. You must cut the ropes at the untied end with a single cut that is parallel to the rod to collect a specified total length of pieces of rope.

Write a function to determine the distance from the rod at which to make the single cut to remove the specified total length of pieces of rope:

```
int cutting_rope(int a[], int n, int sum);
```

where:

- `a[]` – an array of integer elements representing the lengths of the pieces of rope tied to the rod.
- `n` – the number of pieces of rope tied to the rod (i.e., the number of elements in the array).
- `sum` – the sum of the lengths of the pieces of rope that you need to cut away.

Returns the distance from the rod at which to make to make the single cut or -1 if not possible

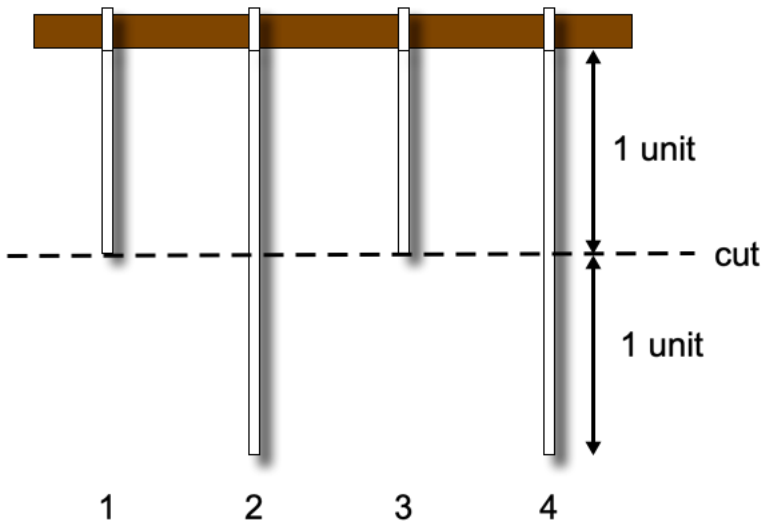
**Files We Give You:** A `makefile` and a sample main program (`cut.cpp`) to test your solution. The executable file created by a successful build will be named `cut`.

**File You Must Submit:** Place your solution code in a file named `solution.cpp`. This will be the only file you submit.

**Examples**

***Input:*** `a[] = {1, 2, 1, 2}, n = 4, sum = 2`
***Returns:*** 1

*Explanation:*



*By cutting 1 unit away from the rod, ropes 1 and 3 are not cut and ropes 2 and 4 are cut. The piece cut away from rope 2 is 1 unit long, and so too is the piece cut away from rope 4. The sum of the lengths of those two pieces cut away from the rod (1+1) is equal to the desired* `sum` *of 2.*

***Input:*** `a[] = {1, 2, 1, 2}, n = 4, sum = 1`
***Returns:*** -1

*Explanation: It is not possible to make a single cut that cuts away pieces of rope whose lengths give a* `sum = 1`*.*

- *Making a cut at distance 0 from the rod cuts all four ropes, producing a* `sum` *of (1+2+1+2), which is 6, not 1.*
- *Making a cut at distance 1 from the rod cuts ropes 2 and 4 and does not cut ropes 1 and 3. The resulting* `sum` *is (1+1) = 2, not the desired 1.*
- *Making a cut at distance 2 or greater from the rod does not cut any of the ropes, giving a* `sum` *of 0, not 1.*