Computer Science Team Week 2

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The College Preparatory School

Computer Science Team
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ACSL

- ACSL contests have 5 multiple choice over 30 mins, and one 3-day coding problem
- Choose either intermediate or senior division
- Sign up from either our email or monad.rocks/acsl!

Fun Coding Problems

Theme: Mid Autumn Festival

- Problems Yuebing, Xiaoming, Houyi

Problem Yuebing

Problem Yuebing Given *mooncakes*, a list of strings of mooncake flavors in a box with some repeated flavors, return the same list with the repeated flavors removed, so that there's only one of each flavor.

```
def unique_mooncakes(mooncakes: List[str])
    -> List[str]
```

Problem Yuebing

Example

```
assert unique_mooncakes([
    "red bean",
    "red bean",
    "white lotus",
    "green tea",
    "white lotus",
    "white lotus"
]) == [
    "red bean",
    "white lotus",
    "green tea"
]
```

Problem Xiaoming

Problem Xiaoming Xiaoming wants to make lanterns with a diamond pattern. Given the odd number *width*, the width of the diamond, output an asci diamond with that width.

```
def diamond(width: int) -> str
```

Problem Xiaoming

Example

```
assert diamond(5) ==
"""
   *
  ***
*****
  ***
   *
"""
```

Problem Houyi

Problem Houyi Oh no! Nine suns have appeared in the sky! Luckily Houyi will shoot them down with his gravity-defying arrows. Houyi is located on a hill at (0, 0). Given *suns*, a list of (x, y) coordinates that give the locations of each sun, output the minimum amount of arrows Houyi needs to shoot all of them down. Each arrow goes infinitely far, needs to go through the sun's coordinates to shoot it down, and can shoot down multiple suns.
Extra fun: each sun is now (x, y, r), where r is the radius of the sun. Do the problem again!

```
def min_arrows(List[Tuple[int, int]]) -> int
```

Problem Houyi

Example

```
assert min_arrows([
    (0, 2048),
    (1, 0),
    (2, 0),
]) == 2
# Houyi can hit all suns by shooting
# one arrow up and one arrow to the right
```

The End

Questions? Comments? Remarks?
Considerations? Confusions?