Computer Science Team Week 12

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Computer Science Team
March 11, 2024

ACSL 3

When should we do it?

Fun coding problems

Theme: Pi!

Problem Import

Problem Import Create a function that returns an approximation of pi, within 0.0001 of pi's actual value. You may use any method you want.

```
def get_pi() -> float
```

Problem Import

Example

```
assert get_pi() == 3.14159265359
```

Problem Greg

Problem Greg The Gregory-Leibniz Series can be used to approximate pi. The formula is $4(1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \ldots)$. Given *n*, the number of terms to evaluate, return the approximation of pi made with *n* terms.

```
def greg(n: int) -> float
```

Problem Greg

Example

```
assert greg(3) == 1 - 1/3 + 1/5
```

Problem Buffon

Problem Buffon In the 18th century, Conte de Buffon was playing with needles on his hardwood floor and was curious about the probability of a needle landing on the crack between two strips of wood. With some magically mathematics, Buffon figured out that if the needle has length l and the strips of wood have width t (with $l < t$), the probability of a needle landing on a strip is $\frac{2}{\pi} \times \frac{l}{t}$. Given a needle length and a wood strip length, simulate a hundred or so needle drops and use the result to estimate the value of pi.

```
def buffon(
    l: float,
    t: float
) -> float
```

Problem Buffon

Example

```
assert buffon(0.8, 2) == 3.140987361
```

The End

Questions? Comments? Remarks?
Considerations? Confusions?