INSTRUCTIONS

- You have 10 minutes to complete this quiz.
- The exam is closed book, closed notes, closed computer, closed calculator.
- Mark your answers on the exam itself. We will not grade answers written on scratch paper.
- For multiple choice questions, fill in each option or choice completely.
  - ☐ means mark all options that apply
  - ☐ means mark a single choice

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<td>First name</td>
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All the work on this exam is my own. (please sign)

0. Your thoughts? What can we do to make your learning experience better?
1. Copy Machine

(a) Peter wants to print this week’s discussion handouts for all the students in CS 61A. However, both printers are broken! The first printer only prints multiples of \( n \) pages, and the second printer only prints multiples of \( m \) pages. Help Peter figure out whether or not it’s possible to print exactly total number of handouts!

```python
def has_sum(total, n, m):
    return has_sum(1, 3, 5)  # False
    return has_sum(5, 3, 5)  # True
    return has_sum(11, 3, 5) # True

    if total % n == 0 or total % m == 0:
        return True
    elif total % n != 0 and total % m != 0:
        return False
    else:
        return None
```

(b) The next day, the printers break down even more! Each time they are used, the first printer prints a random \( x \) copies \( 50 \leq x \leq 60 \), and the second printer prints a random \( y \) copies \( 130 \leq y \leq 140 \). Peter also relaxes his expectations: he’s satisfied as long as there’s at least lower copies so there are enough for everyone, but no more than upper copies to prevent waste.

```python
def sum_range(lower, upper):
    return sum_range(45, 60)  # True
    return sum_range(40, 55)  # False
    return sum_range(170, 201) # True

    def copies(pmin, pmax):
        return copies(0, 0)
```