CS 160
CS Orientation
Designing Functions
Odds and Ends...

- Assignment #7 questions?
- Use your TA office hours!!!
- Assignment #6 demoed this week!!!
Revisit Exercise #6

Design a Python function called my_sqrt() that takes a positive whole number $n$ as input and returns the square root of $n$ using the Babylonian algorithm. The Babylonian algorithm computes the square root of a positive number, $n$, as follows:

1. Make a guess at the answer (you can pick $n/2$ as your initial guess).
2. Compute $r = n / \text{guess}$
3. Set $\text{guess} = (\text{guess} + r) / 2$
4. Go back to step 2 for as many iterations as necessary. The more steps 2 and 3 are repeated, the closer guess will become to the square root of $n$.
5. Compare your square root function with the math.sqrt() result.
Demo...

```python
1 def my_sqrt(n): #n=num
2     guess = n / 2
3     # Also, you could ask user for iterations or stop when a threshold is reached, such as absolute value of new_guess-old_guess < 0.000001
4     for i in range(1000):
5         r = n/guess
6         guess = (guess + r)/2
7     return guess
8
9 # main function of where to start our program
10 def main():
11     num=int(input("Enter positive num: "));
12     my_sqrt(num);
13
14 main(); # start by calling main function
```
Revisit function design...

• For all the employees in our company, calculate their gross pay based on their hours and pay rate.

• Create a function to get number of employees.
  – Make sure this function only returns a valid integer.

• Create function called gross_pay that takes the number of employees and calculates gross pay for each.

• Create a main function where the program begins.
Designing Functions...
Programming Demo/Functions
What if the problem changed?

• What if you have to make sure the user gives you a valid hour and pay?