

CPE-390 2022S Quiz #₃ (no pressure, diagnostic)

Name: _____

1. (60 points) Write functions to compute the following:
 - a. Compute the product of integers from a to b
 - b. Compute the average (mean) of the numbers in an array
 - c. Given r and theta, return x and y by reference. The equation is
 $x = r\cos\theta$, $y = r\sin\theta$

```
int main() {
    uint64_t ans1 = prod(a,b);
    double arr[] = {10, 20, 30, 40};
    double avg = mean(arr, 4);
    double x, y;
    double r = 4, theta = pi/2;
    polar2rect(r, theta, x, y); // note: x and y are passed by reference
```

2. (40 points) Identify what is wrong in each example

a.

```
uint64_t a = 2*2;  
uint64_t b = 50000 * 50000;
```

b. function should sum the numbers 1..n

```
uint64_t sum(int n) {  
    uint64_t s;  
    for (int i = 0; i < n; i++)  
        s += i;  
    return s;  
}
```

c. function should sum $0 + 0.1 + 0.2 + \dots + 9.9 + 10.0$

```
double sum() {  
    double s;  
    for (double x = 0; x != 10; x += 0.1)  
        s += x;  
    return s;  
}
```