CS32 Midterm 2 Study Guide Solutions

Recursion

2. mystery(5) → 3 * mystery(4) → 3 * 3 * mystery(3) → 3 * 3 * 3 * mystery(2) → 3 * 3 * 3 * 3 * mystery(1) → 3 * 3 * 3 * 3 * 3 * mystery(0) → 3 * 3 * 3 * 3 * 3 *1 = **243** (NOTE: show work above to get partial credit even if final answer is wrong – what I should've done the first time to check my work! =])
3. recur(27) → recur(recur(9)) → recur(9 * 2) → recur(18) → recur(recur(6)) → recur(6 * 2) → recur(12) → recur(recur(4)) → recur(4 * 2) → recur(8) → 8 * 2 = **16**
4.

```
double Power (double x, unsigned int n)
{
   if (n == 0) return 1;
   return x * Power (x, n – 1);
}
```

5.

```
double Power (double x, unsigned int n)
{
   if (n == 0) return 1;
   if (n % 2 == 0)
   {
      return Power (x, n/2) * Power (x, n/2);
   }
   else // if (n % 2 != 0)
   {
      return x * Power (x, n/2) * Power (x, n/2);
   }
}
```

6.

```
int Product (int m, int n)
{
   if (m > n) return 1;
   return m * Product (m + 1, n);
}
```

7.

```
int Min(int a[], int n)
{
     return Min_aux(a, 0, n - 1);
}

int Min_aux(int a[], int j, int k)
{
     int min;
```

```
     if (j >= k - 1)
     {
          if (a[j] < a[j + 1])
               return a[j];
          else
               return a[j + 1];
     }

     min = Min_aux(a, j + 1, k);

     if (a[j] < min)
          return a[j];
     else
          return min;
}
```

Inheritance/Polymorphism

1.

```
Yummy
Hello
ZZZZ
Yummy
I love school
ZZZZ
Yummy
Go Bruins!
ZZZ... CS 32 ...ZZZZ
Study for midterm test
ZZZZ
Study for midterm test
Yummy
ZZZ... CS 32 ...ZZZZ
```