

1)

For $i=0$, `compute()` takes $O(j)$ time for all $(0 < j < m)$, which sums up to $(m(m+1))/2$

For $i=1$, `compute()` takes $O(j-1)$ time for all $(1 < j < m-1)$, which sums up to $((m(m+1))/2)-m$

For $i=2$, `compute()` takes $O(j-2)$ time for all $(1 < j < m-2)$, which sums up to $((m(m+1))/2)-m-(m-1)$

.

For $i=m$, `compute()` takes $O(1)$.

This makes `compute` runs according to the triangular number series from m to 0 . Summing up the triangular series gives $(m(m+1)(m+2))/6$

For $i>m$, `compute()` takes $O(1)$ each, summing up to $O(m)$

So in total the code takes $(m(m+1)(m+2))/6 + m$ which is $O(m^3)$

It is upper bounded by $O(2m^3)$

And lower bounded by $O(m^2)$

2) For $i=1$, it computes $1*2*3*4*5....*m = m!$

For $i=2$, it computes $2*3*4*5*6....*m = m! / 1!$

For $i=3$, it computes $3*4*5*6*7....*m = m! / 2!$

For $i=m$, it computes $m = m! / (m-1)!$

In terms of i and j , $B[i][j]$ contains the value $i*(i+1)*(i+2)*...*j$ generally and contains 1 when $j \leq i$.

3) For $n=1000$, it takes 0.07255 seconds.

4) Code file submitted

5) For $n=1000$, it takes 0.01196 seconds.