

Examples of Analysis

Give the asymptotic running time of the following algorithms in Θ notation. Give your solution in the simplest terms possible. Show how you get the answer.

- ```
1. function func1(n)
 s ← 0;
 for i ← n to n2 do
 for j ← n to i do
 s ← s + j - i;
 return(s);
```

$n^4$
- ```
2.  function func2(n)
      s ← 0;
      for i ← n to n3 do
        j ← 1;
        while j < i2 do
          j ← j × 2;
          s ← s + j - i;
      return(s);
```

$n^3 \log n$
- ```
3. function func3(n)
 s ← 0;
 for i ← n2 to n2 + n do
 for j ← i to i + 680 do
 for k ← 1 to j do
 s ← s + j - i + 2k;
 return(s);
```

$n^3$
- ```
4.  function func4(n)
      s ← 0;
      i ← 1;
      while i < n2 do
        j ← 1;
        while j < i2 do
          j ← j + 1;
          s ← s + i - j;
        i ← i × 2;
      return(s);
```

n^4
- ```
5. function func5(n)
 s ← 0;
 for i ← 1 to 3n2 do
 for j ← 1 to $\lfloor 2n^3/i \rfloor$ do
 s ← s + i - j;
 return(s);
```

$n^3 \log n$