(12-2) Recursion II
H&K Chapter 9

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What is a Recursive Function?

Graphs are from:
https://www.banggood.com/Set-of-5-Cute-Wooden-Nesting-Dolls-Matryoshka-Animal-Russian-Doll-p-964569.html?cur_warehouse=CN
https://www.imdb.com/title/tt7520794/

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What is a Recursive Function?

```
int recursive_function (int r, int s)
{
  if ( s== 1) {…..}

  /* recursive call */
  recursive_function (r, s-1) …
}
```

Base Case

Calculate n!

```
int rec_factorial (int n)
{   int result = 0;

    if ((n == 0) || (n==1)) {result = 1;}
    else
    {result = n * rec_factorial (n – 1);}

    return result;
}
```


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Properties of Recursion

- Key differences

	Recursion	v.s.	Iteration
Infinite	system crash		consumes CPU cycles
processor time	sometimes expensive		Not
memory space	expensive		Not
code	smaller		longer
solution	may simple		may difficult
	Mathematician's preference		CS's preference

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Next Lecture…

- Bits and bit operations

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References

- J.R. Hanly & E.B. Koffman, *Problem Solving and Program Design in C (8th Ed.)*, Addison-Wesley, 2016
- P.J. Deitel & H.M. Deitel, *C How to Program (7th Ed.)*, Pearson Education , Inc., 2013.

Collaborators

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