HO CHI MINH UNIVERSITY OF TECHNOLOGY
FACULTY OF COMPUTER SCIENCE AND ENGINEERING


## OPERATING SYSTEM LAB (CO2018)

# LAB 8 : MEMORY ALLOCATION

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# 1 PROBLEM 1 :

## 1.1 First-Fit algorithm

| Process Number | Process Size | Block Number | Block Size |
|---|---|---|---|
| 1 | 115 | 1 | 300 |
| 2 | 500 | 2 | 600 |
| 3 | 358 | 5 | 750 |
| 4 | 200 | 3 | 350 |
| 5 | 375 | 5 | 392 (initial 750) |

## 1.2 Best-Fit algorithm

| Process Number | Process Size | Block Number | Block Size |
|---|---|---|---|
| 1 | 115 | 6 | 125 |
| 2 | 500 | 2 | 600 |
| 3 | 358 | 5 | 750 |
| 4 | 200 | 4 | 200 |
| 5 | 375 | 5 | 392 (initial 750) |

## 1.3 Worst-Fit algorithm

| Process Number | Process Size | Block Number | Block Size |
|---|---|---|---|
| 1 | 115 | 5 | 750 |
| 2 | 500 | 5 | 635 (intial 750) |
| 3 | 358 | 2 | 600 |
| 4 | 200 | 3 | 350 |
| 5 | 375 | Not Allocated (must wait) | |

Ranking :

- Only Worst-Fit does not allow a request to be satisfied.
- Best-Fit is most efficient as it leaves the largest holes after allocation.
- However, Best-Fit runs at time O(n) and First-Fit runs in constant time O(1).

# 2 PROBLEM 2 :

**First-Fit Algorithm:**

*Advantages:* Fastest algorithm because it searches as little as possible.
*Disadvantages:* The remaining unused memory areas left after allocation become waste if it is too smaller. Thus request for larger memory requirement cannot be accomplished.

**Best-Fit Algorithm:**

*Advantages:* Memory utilization is much better than first fit as it searches the smallest free partition first available.

*Disadvantages:* It is slower and may even tend to fill up memory with tiny useless holes.

**Worst-Fit Algorithm:**

*Advantages:* Reduces the rate of production of small gaps.
*Disadvantages:* If a process requiring larger memory arrives at a later stage then it cannot be accommodated as the largest hole is already split and occupied.