Worksheet 07

1. Memory contains 6 holes with their sizes shown in the table.

Hole	A	B	C	D	E	F
Size	140	70	90	120	60	40

A sequence of requests for 3 blocks have arrived with sizes 10, 50, and 80. Select the hole allocated to each request by the first-fit allocation strategy.

Which holes will be allocated for each block?

2. Memory contains 6 holes with their sizes shown in the table.

Hole	A	B	C	D	E	F
Size	80	90	10	100	40	60

A sequence of requests for 3 blocks have arrived with sizes 70, 50, and 20. Select the hole allocated to each request by the next-fit allocation strategy.

Which holes will be allocated for each block?

3. Memory contains 6 holes with their sizes shown in the table.

Hole	A	B	C	D	E	F
Size	20	140	70	120	110	60

A sequence of requests for 3 blocks have arrived with sizes 50, 40, and 30. Select the hole allocated to each request by the best-fit allocation strategy.

Which holes will be allocated for each block?

4. Memory contains 3 holes of 10 MB each. A sequence of 14 requests for 1 MB each is to be processed. For each of the four memory allocation strategies, determine the sizes of the remaining holes after all 14 requests have been satisfied.

5. Memory size is 18 MB. Hole size = block size = 1 KB. The 50% rule holds. (I MB =1000 KB)

   (a)Determine the total number of holes.
   (b) Determine the total number of occupied blocks.
   (c) Determine the amount of space occupied by holes in MB.

6. The 50% rule refers only to the number of holes and blocks, but not the amounts of memory space taken up by the holes and blocks. The amounts of space depend on the average hole size vs the average block size. If k is the ratio between average hole size and average block size, then the fraction f of space occupied by holes can be determined using the formula $f = k / (k + 2)$.
   a. Determine the fraction of space wasted in holes if, on average, an occupied block is twice as large as a hole.

   b. Determine the fraction of space wasted in holes if, on average, a hole is twice as large as an occupied block.