CG2271 Real-Time Operating Systems

Tutorial 8

Q1. Suppose the holes available for allocation are of the following size in that order:
10KB, 4KB, 20KB, 18KB, 7KB, 9KB, 12KB, 15KB

Three processes A, B, and C with the respective sizes of 12 KB, 10 KB and 9 KB are to be allocated successively. Describe the results of the allocation when the following allocation methods are used:

a. first fit
b. best fit
c. worst fit
d. next fit

Which algorithm makes use of the memory space the best?

Q2. Consider the following code fragment:

```
int x;
int *p;
int f=0;
int y = 0;

main(){
   int g;

   p = malloc(100);
   f = 6;
   sub(f, g);
}

void sub(int a, int b){
  int c;

 c = a;
 a = x;
 b = y;
 x = y;
 *p = b;
}
```

Explain where each of the variable will be located in memory? Draw the content of the stack memory when sub ( ) is executing.

Q3. In this question we will consider a virtual memory system with 64 bytes per page, 10 bit virtual addresses and 9 bit physical addresses.

a. What is the maximum size in bytes of the virtual memory? Physical memory?

b. What is the maximum number of virtual and physical pages?

c. Using the page table below, translate the following virtual addresses to physical addresses: 0, 15, 576, 987, 1020

	V	PPN
0	1	2
1	1	3
2	0	
3	0	
4	1	4
5	1	7
6	0	
7	0	
8	0	
9	1	6
10	0	
11	0	
12	1	5
13	0	
14	0	
15	1	1

Q4. You are required to develop a program that will move 1MByte of data from address 0xC0000000 to 0xD0000000. You must update the progress of the data transfer for every 1Kbyte of data. This is done by updating an LCD panel that is connected to the system.

Discuss two ways in which the objective can be realized. Elaborate on their pros and cons.

THE END