OS Sheet 6

Problem 1:

a)

Process	Arrival Time	Execution Time
A	**0**	**9**
B	**4**	**8**
C	**6**	**2**
D	**8**	**5**
E	**13**	**4**
F	**15**	**1**

FCFS:

| A | B | C | D | E | F |

0 9 17 19 24 28 29

SPTF:

| A | C | D | F | E | B |

0 9 11 16 17 21 29

LPTF:

| A | B | D | E | C | F |

0 9 17 22 26 28 29

RR:

A A A A B A B C A B D C A B D E A B F D E A B D E B D E B

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29

b)

FCFS:

Waiting time for:

A = 0 - 0 = **0** **B** = 9 - 4 = **5** **C** = 17 - 6 = **11** **D** = 19 - 8 = **11** **E** = 24 - 13 = **11**
F = 28 - 15 = **13**

W*avg* = (0 + 5 + 11 + 11 + 11 + 13) / 6 = **8.5**

Turnaround time for:

A = 9 - 0 = **9** **B** = 17 - 4 = **13** **C** = 19 - 6 = **13** **D** = 24 - 8 = **16** **E** = 28 - 13 = **15**
F = 29 - 15 = **14**

T*avg* = (9 + 13 + 13 + 16 + 15 + 14) / 6 = **13.3333333**
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SPTF:

Waiting time for:

A = 0 - 0 = **0** **C** = 9 - 6 = **3** **D** = 11 - 8 = **3** **F** = 16 - 15 = **1** **E** = 17 - 13 = **4**
B = 21 - 4 = **17**

W*avg* = (0 + 3 + 3 + 1 + 4 + 17) / 6 = **4.667**

Turnaround = Waiting + Execution

Turnaround time for:

A = 0 + 9 = **9** **C** = 3 + 2 = **5** **D** = 3 + 5 = **8** **F** = 1 + 1 = **2** **E** = 4 + 4 = **8**
B = 17 + 8 = **25**

T*avg* = (9 + 5 + 8 + 2 + 8 + 25) / 6 = **9.5**

LPTF:

Waiting time for:

A = 0 - 0 = **0** **B** = 9 - 4 = **5** **D** = 17 - 8 = **9** **E** = 22 - 13 = **9** **C** = 26 - 6 = **20**
F = 28 - 15 = **13**

W*avg* = (0 + 5 + 9 + 9 + 20 + 13) / 6 = **9.33333**

Turnaround = Waiting + Execution

Turnaround time for:

A = 0 + 9 = **9** **B** = 5 + 8 = **13** **D** = 9 + 5 = **14** **E** = 9 + 4 = **13** **C** = 20 + 2 = **22**
F = 13 + 1 = **14**

T*avg* = (9 + 13 + 14 + 13 + 22 + 14) / 6 = **14.16666**

RR:

Waiting time for:

A = 22 - 0 - 9 = **13** **B** = 29 - 4 - 8 = **17** **C** = 12 - 6 - 2 = **4** **D** = 27 - 8 - 5 = **14**
E = 28 - 13 - 4 = **11** **F** = 19 - 15 - 1 = **3**

W*avg* = (13 + 17 + 4 + 14 + 11 + 3) / 6 = **10.33333**

Turnaround = Waiting + Execution

Turnaround time for:

A = 13 + 9 = **22** **B** = 17 + 8 = **25** **C** = 4 + 2 = **6** **D** = 14 + 5 = **19** **E** = 11 + 4 = **15**
F = 3 + 1 = **4**

T*avg* = (22 + 25 + 6 + 19 + 15 + 4) / 6 = **15.16666**

Problem 2:

a)

File	Symbol	Internal	External	Weak	Strong
a.c	x				
a.c	y				
a.c	z				
a.c	f				
a.c	g				
b.c	x				
b.c	y				
b.c	z				
b.c	f				

b.c	g				

b)

"***Extern void f()***" is pointing to "***f()***" which is in "***b.c***" because it's external and one in "***a.c***" is internal because of the "***static***" keyword.
"***f()***" in "***b.c***" will print "***b.c: f()***" and call "***g()***" which is in "***a.c***"
"***g()***" in "***a.c***" will print "***a.c: g()***" and call "***f()***" in "***a.c***".
"***f()***" in "***a.c"*** will finally print "***a.c: f()***".

OUTPUT:
b.c: f()
a.c: g()
a.c: f()

c)

Name mangling is a technique to solve problems caused by the need for unique names in many programming languages(Wiki). To put it differently: Name mangling solves the problem of overloaded identifiers.

Take two functions: “***float f(int)”*** and “***int f(int)”*** in **C++** program. Functions have the same but different types of signatures. We can use name mangling to integrate their names so they will have different names. The linker will do this

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Sometimes we don’t want **C++** linker to touch **C** code. In that case, we use “***extern “C” {}”*** to tell the computer that’s it’s a **C** code and use the **C** naming and calling conventions and not the **C++** name mangling and calling conventions.