

Status	Finished
Started	Thursday, 6 February 2025, 12:02 AM
Completed	Thursday, 6 February 2025, 12:13 AM
Duration	10 mins 34 secs
Grade	100.00 out of 100.00

Information

True and False questions

(on [Exam 1](#) you will get more questions of this type)

Question **1**

Correct

Mark 10.00 out of 10.00

In a priority scheme to handle multiple interrupts, the system disables the interrupts while an interrupt is being processed.

Select one:

- ☐ True
- ☒ False ✓

The correct answer is 'False'.

Information

Simple Choice questions

(on [Exam 1](#) you will get more questions of this type)

Question **2**

Correct

Mark 10.00 out of 10.00

Select the element that is not part of the process control block:

- ☐ a. PID
- ☐ b. Priority
- ☐ c. State
- ☒ d. Program code ✓
- ☐ e. None of the above

The correct answer is:

Program code

Calculate the average access time to read a word from memory for the following two-level memory system.

Level 1 memory access time = 50 ms

Level 2 memory access time = 400 ms

Failure ratio = 20%

Time to find a word in any level of the memory (0 ms). **(15 points).**

Question **3**

Correct

Mark 10.00 out of 10.00

Average access time =

Answer: 

The correct answer is: 130

Calculate the following parameters of a hypothetical computer system with these features:

a) Octal notation;

b) IR = OPCode + Mem Addr;

c) IR = 12 bits;

d) PC = 3 octal digits; and

e) Mem word size = Data (unsigned integer) = IR. **(15 points)**

Question **4**

Correct

Mark 5.00 out of 5.00

Number of different OPCODEs:

Answer: 

The correct answer is: 8

Question **5**

Correct

Mark 5.00 out of 5.00

Mem size in bits:


Answer: 

The correct answer is: 6144

Question **6**

Correct

Mark 5.00 out of 5.00

Mem range: 


The correct answer is:

Mem range: [000 - 777]

Question **7**

Correct

Mark 5.00 out of 5.00

Data range: 

The correct answer is:

Data range: [0000 - 7777]

Question 8

Correct

Mark 30.00 out of 30.00

Complete the C++ program below to generate the following process tree:

UID	PID	PPID	C	STIME	TTY	TIME	CMD
501	18282	18281	0	6:21AM	ttys000	0:00.01	/bin/bash -l
501	18360	18359	0	6:26AM	ttys001	0:00.04	-bash
501	18419	18360	0	6:29AM	ttys001	0:00.00	./PQ1
501	18420	18419	0	6:29AM	ttys001	0:00.00	./PQ1
501	18421	18419	0	6:29AM	ttys001	0:00.00	./PQ1
501	18422	18419	0	6:29AM	ttys001	0:00.00	./PQ1
501	18423	18421	0	6:29AM	ttys001	0:00.00	./PQ1
501	18413	18412	0	6:29AM	ttys002	0:00.01	-bash

Notes:

1. PQ1 is the name of the process.
2. Use wait and _exit when needed to guarantee the following output:


```
I am the parent process
I am the child process 0
I am the child process 1
I am a grandchild process from child process 1
I am the child process 2
```

Answer: (penalty regime: 0 %)

Reset answer

```
1 #include <iostream>
2 #include <unistd.h>
3 #include <sys/wait.h>
4
5 int main()
6 {
7     int pid;
8     std::cout << "I am the parent process" << std::endl;
9     for(int i = 0; i < 3; i++){
10         if((pid=fork())==0){
11             std::cout << "I am the child process " << i << std::endl;
12             if(i==1){
13                 if((pid=fork())==0){
14                     std::cout << "I am a grandchild process from child process " << i << std::endl;
15                     _exit(0);
16                 }
17                 wait(nullptr);
18             }
19             _exit(0);
20         }
21         wait(nullptr);
22     }
23 }
24
25 // std::cout << "I am the parent process" << std::endl;
26 // std::cout << "I am the child process " << /*variable identifier*/ << std::endl;
27 // std::cout << "I am a grandchild process from child process " << /*variable identifier*/ << std::endl;
28 return 0;
29 }
```

	Expected	Got	
✓	I am the parent process I am the child process 0 I am the child process 1 I am a grandchild process from child process 1 I am the child process 2	I am the parent process I am the child process 0 I am the child process 1 I am a grandchild process from child process 1 I am the child process 2	✓

Passed all tests! 

▸ [Show/hide question author's solution \(C++\)](#)

Correct

Marks for this submission: 30.00/30.00.

Question 9

Correct

Mark 20.00 out of 20.00

The multithreaded calculator.

You must complete the program below (using POSIX threads) that creates four threads to calculate the addition, subtraction, multiplication, and division of a set of numbers read from STDIN.

The input of the program will be four pair of integer values with the following format:

```
1 2
2 3
4 5
6 7
```

Where the first line has the values to execute the addition, the second line has the values to execute the subtraction, the third line has the values to execute the multiplication, and the last line has the values to execute the division. For the division operator, if the denominator is equal to zero, the result of the operation is zero.

Given the previous input, the expected output is:

```
1 + 2 = 3.00
2 - 3 = -1.00
4 * 5 = 20.00
6 / 7 = 0.86
```

Notes:

1. Use the comments in the provided template file to complete your solution.
2. Not using POSIX threads will translate into a penalty of 100%.
3. You can always assume that the input will be valid.

For example:

Input	Result
10 20	10 + 20 = 30.00
5 2	5 - 2 = 3.00
3 2	3 * 2 = 6.00
1 100	1 / 100 = 0.01

Answer: (penalty regime: 0 %)

Reset answer

```

27         pos_ptr->result = pos_ptr->val1 * pos_ptr->val2;
28         break;
29     case 3: // Division
30         if(pos_ptr->val2 == 0)
31             pos_ptr->result = 0;
32         else
33             pos_ptr->result = (1.0*pos_ptr->val1)/pos_ptr->val2;
34         break;
35     }
36     return NULL;
37 }
38
39 int main()
40 {
41     static struct operation operations[NOPER];
42     pthread_t tid[NOPER];
43
44     for(int i=0;i<NOPER;i++)
45     {
46         operations[i].op = i;
47         std::cin >> operations[i].val1;
48         std::cin >> operations[i].val2;
49         if(pthread_create(&tid[i], NULL, calculator, &operations[i]))/* Call pthread_create */
50         {
51             fprintf(stderr, "Error creating thread\n");
52             return 1;
53         }
54     }
55 }
56
57 // Wait for the other threads to finish.
58 // Call pthread_join here
59 for(int x = 0; x < NOPER; x++)
60     pthread_join(tid[x], nullptr);
61
62 for (int i = 0; i < NOPER; i++)
63 {
64     switch(operations[i].op)
65     {

```

```

65     }
66     case 0: std::cout << operations[i].val1 << " + " << operations[i].val2 << " = " << std::fixed << std::setprecision(2) << operations[i].result
67             break;
68     case 1: std::cout << operations[i].val1 << " - " << operations[i].val2 << " = " << std::fixed << std::setprecision(2) << operations[i].result
69             break;
70     case 2: std::cout << operations[i].val1 << " * " << operations[i].val2 << " = " << std::fixed << std::setprecision(2) << operations[i].result
71             break;
72     case 3: std::cout << operations[i].val1 << " / " << operations[i].val2 << " = " << std::fixed << std::setprecision(2) << operations[i].result
73             break;
74     }
75 }
76 return 0;
77 }

```

	Input	Expected	Got	
✓	10 20 5 2 3 2 1 100	10 + 20 = 30.00 5 - 2 = 3.00 3 * 2 = 6.00 1 / 100 = 0.01	10 + 20 = 30.00 5 - 2 = 3.00 3 * 2 = 6.00 1 / 100 = 0.01	✓
✓	1 2 100 200 3 7 50 3	1 + 2 = 3.00 100 - 200 = -100.00 3 * 7 = 21.00 50 / 3 = 16.67	1 + 2 = 3.00 100 - 200 = -100.00 3 * 7 = 21.00 50 / 3 = 16.67	✓
✓	45 3 33 2 10 9 100 0	45 + 3 = 48.00 33 - 2 = 31.00 10 * 9 = 90.00 100 / 0 = 0.00	45 + 3 = 48.00 33 - 2 = 31.00 10 * 9 = 90.00 100 / 0 = 0.00	✓

Passed all tests! ✓

► Show/hide question author's solution (Cpp)

Correct

Marks for this submission: 20.00/20.00.

◀ Programming Assignment 1

Jump to...

Exam 2 - Practice ►

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