Operating Systems (CSE231 Sec A&B)
Monsoon 2021 Quiz 1
(Total points: 35)

Sambuddho Chakravarty, Arani Bhattacharya

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Submission deadline: November 1, 2021 @ 1200hrs.

Problem 1: 5 points.

Try to compile the following code snippet (no need to link).

```
 char add(float a,float b)
{
return (int)(round (a)+round (b)) ;
}
```

Would the compilation of this code snippet result in errors or warnings? Would this code, if compiled and linked with a full fledged program result in any logical errors? Answer both parts accurately.

What to submit:

- Command (with appropriate arguments) that were used to compile the snippet.
- A writeup showing all the compilation errors and warnings that you may have encountered and their possible explanations, along with the logical errors (if any if you think there are, *i.e.*).

Problem 2: 10 points (5+5).

Two code snippets are being presented to you.

1.
```
 mov rax, 0x1234567812345678
xor ax, 0x11
mov rdi, ax
call printf
xor rax, 0x11
mov rdi, rax
call printf
```

2.
```
int x=-2;
unsigned int y = -33;
int z;
z = x + y;
printf(''%u %u %u'', x,y,z);
printf(''%d %d %d'', x,y,z);
```

In both the parts (1) and (2), explain what the two `printf` function calls result in. Explain the reasons for any differences in the two cases.

What to submit:

- Write-up describing an explanation of the output from the two `printf`s possible explanations.

Problem 3: 5 points.

What would be the output of the following program? Explain.

```
int main()
    {
      pid_t pid1;
      printf(''before fork()'');
      if((pid1=fork())>0)
      {
        waitpid(pid1, NULL, 0);
       }

     else if(pid1 == 0) {
        execl(''/usr/bin/bash'',''bash'',NULL);
        printf(''done launching the shell'');
        }

     else {
      perror(''fork()'');
     }
    }
```

What to submit:

- Write-up describing an explanation for the output (*i.e.* why you observe what you observe).

Problem 4: 5 points.

Let us say that you have a program that uses SCHED_FIFO scheduling. How would the vruntime variable for such a program be computed or updated ?

How is this different from how vruntime would be updated for SCHED_RR and SCHED_NORMAL ?

Problem 5: 10 points (5+5).

1. In the following program, what would be the final output? Explain in detail.

```
 void copy_arr(char *p1, char p2[]) {
memcpy(p2,p1,sizeof(p1));
memcpy(p2,``ABCD'',4);
}

int main(){
   char arr1[100];
   char arr2[100];
   printf(``Enter a string:'');
   scanf(``%[^\n]s'', arr1);
   copy_arr(arr1,arr2);
   printf(``\n %s'',arr2);
   return 0;
}
```

2. Consider the following program:

```
int main(void) {
        int a = 2, *b = NULL;
        b = &a;
        printf(``%p'', b + 1);
        printf(``%p'',  (char *)b + 1);
        printf(``%p'', (void *)b + 1);
        }
```

   Suppose the address of a is equal to 0x1000. What is the output of the above program? Explain in detail.

What to submit:

- Write-up describing an explanation for the output (*i.e.* why you observe what you observe), for both the cases.