Computer Systems and -architecture

MIPS: Introduction

1 Ba INF 2018-2019

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Time Schedule

Exercises are made individually. Put all your files in a tgz(!) archive, as explained on the course's website, and submit your solution to the exercises on Blackboard.

- Deadline: **November 15, 23u55**

Exercises

Write a MIPS program for the MARS simulator for each of the following exercises. As always, document your solution well (use #).

1. Read an integer `n` (use `syscall`), and print
   `This is my n-th MIPS-program.`
   on the screen.

2. Convert the C++ code below to a MIPS program.

   ```
   for (int i = 1; i < 11; i++)
   {
       cout << i << endl;
   }
   ```

3. Write a program that reads an integer `n` and prints a pyramid of `n` rows, with on each row a sequence of integers starting with 1. With `n = 4` the output should be:

   ```
   1
   1 2
   1 2 3
   1 2 3 4
   ```

4. Convert the C++ code below to a MIPS program. (Use a jump table with the `jr $t1` instruction and use the `la $t1, label` instruction to explicitly model the branch table)

   ```
   int i = 1;
   int a = 0;
   switch (i) {
   ```

```
        case 0:
                a = 9;
                break;
        case 1:
                a = 6;
        case 2:
                a = 8;
                break;
        default:
                a = 7;
                break;
    }
    std::cout << a << endl;
```

5. Write a program that prints 'Prime' if a given number is prime or prints 'No prime' otherwise.

6. Write a program that asks the user for the radius and uses it to compute the area of a circle. *Use floating point instructions and registers!*