

Computer Systems and -architecture

MIPS: Introduction

1 Ba INF 2020-2021

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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. Put every exercise in a different `.asm` file with the following names: `exerciseX.asm`.

- Deadline: **December 6, 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!*