Modulo Airthmetic
Lesson Plan: Class 08 / IP / 01

CS pathshala
Bringing computational thinking to schools

Overall goal of the lesson: Children learn to understand the concept of modulo arithmetic.
Prior knowledge required: None
MODULE 1:
Module time: 35 X 1 minutes
Goal: To understand the concept of modulo arithmetic and apply the learning in cryptography which will be taught as a separate module

Description: Children will learn to look for patterns that wrap around and hence be able to determine the modulus of a given number.

Material required:
Physical:
1. One copy of the worksheet per child.
2. Writing material to solve the worksheet: pencil and eraser.
3. Cut out of a calendar as mentioned in the presentation
4. A cut out of a clock

Electronic:
PPT Presentation

Procedure Summary:
1. Run through the presentation
2. Do all the activities that are in the presentation
3. Distribute the worksheets
4. Let children try to solve them in class and help them with the answers

Procedure Details:
1. Slide 2:
   Ask the children to describe their routine jobs they do in a day, Ask them to describe   parts of a day.

2. Slide 3 &4:
   Show them the calendar and ask them what common pattern they can see in it. Make them focus on a day and let them list down all the dates that fall on Sunday. Now ask them to see if they can find a pattern in the numbers they have listed. Let them take two consecutive numbers and subtract them. Let them observe that the difference between the two numbers is a constant in this case its 7.

3. Slide 5 &6:
   Now ask them to think of a similar example where a set of numbers have a common difference.
    They can think of the angles of a circle (0 to 360deg), coach numbers in a train, door numbers in a street etc.
    Now explain the concept of arithmetic progression to them as described in the slide.
    Ask them to find the common difference

4. Slide 7 &8:
   Now lets take an example of a clock. Ask the children what differences they see in a 12 hour clock and a 24 hour clock.

Wait for them to answer that the numbers from 1 to 12 keep repeating and it wraps around at 12 in a 12 hour clock and at 24 in a 24 hour clock.
The concept of numbers wrapping around is important to explain the concept of modulo arithmetic.

5. Slide 9 and 10:
   Now ask represent a given time using 12hour and 24-hour clock format.

6. Slide 11 & 12
   Explain the definition of a modulo arithmetic, now we should explain the concept of numbers wrapping around after reaching 12 in a clock. This can be done what the time would be 3 hours later if the current time is 7AM. Questions mentioned in the slide can be asked. Explain the concept of numbers wrapping around after reaching 12.

7. Slide 13, 14 and 15
   Teach them the mathematical approach for computing the modulus of a given number.
   Explain them the concept of congruency

8. Provide them the work sheets and check their understanding of modulo arithmetic