ESc101N: Fundamentals of computing(Lab Session 5)

September 2, 2009

Instructions

1. Please read the question carefully and write the program accordingly
2. Make sure that the TA has graded you program
3. The marks are distributed as follows. You get 60% of the marks if the basic algorithm is current, 20% if you manage to compile and execute and 20% for writing the code cleanly, i.e. using proper variable names, intending and making the code more readable.

Question 1. (10 marks) Use a two dimensional array to speed up printing the Pascals triangle mod 2. Recall that the Pascals triangle (mod 2) of height n consists of $n+1$ lines of integers 0 and 1 where for $1 \leq r \leq \ell \leq n$, the $r+1$st integer in the $\ell+1$st line is the value of $\binom{\ell}{r} \mod 2$.

To calculate $\binom{n}{r} \mod 2$ make use of the formula

$$\binom{n}{r} = \binom{n-1}{r-1} + \binom{n-1}{r}.$$

A 2 dimensional array can be declared as `int a[100][100]` and the i,jth entry can be accessed as `a[i][j]`. Store in `a[i][j]` the value $\binom{i}{j} \mod 2$.

Sample output.

```
$ ./pascal
enter the height of the pascals triangle: 25
1
11
101
1111
10001
110011
1010101
11111111
100000001
1100000011
10100000101
111100001111
1000100010001
11001100110011
101010101010101
1111111111111111
10000000000000001
11000000000000011
```

```
1010000000000000101
11110000000000001111
10001000000000010001
11001100000000000110011
10101010000000001010101
11111111000000011111111
10000000100000001000000001
11000000110000001100000011
```

Question 2. (0 marks) (Not to be graded). Print the pascals traingle for large n on your xterm. Make the font of your terminal really small and make it full screen.