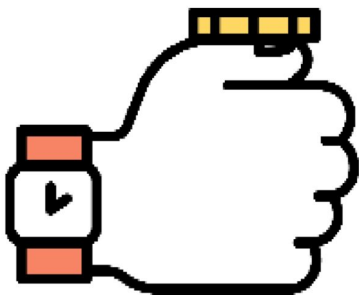

ECS 101 Final Project

Coin-Flipping Game

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Coin-Flip

This is what normal people do



This is what students do after taking computer class



Introduction

- Conditions:
 - 144 turns
 - Score 1 or more points to win
 - Quarter= +2/-2, Dime=+1/-1 (Unit : Point)
- 144 turns and minimum score of -100, maximum score for quarter is 100 and maximum score for dime is 50 . (Columns for turns) (Rows for scores)
- Apply the algorithms we have to simulate the highest possible chance to win the game

Algorithms

- Dime : $0.5 * f(s-1, t-1) + 0.5 * f(s+1, t-1)$
- Quarter : $0.5 * f(s-2, t-1) + 0.5 * f(s+2, t-1)$
- $\text{Max}\{0.5 * f(s-1, t-1) + 0.5 * f(s+1, t-1), 0.5 * f(s-2, t-1) + 0.5 * f(s+2, t-1)\}$

Applying the Algorithm

Dimes algorithm

Quarter algorithm

`=MAX(0.5*C300+0.5*E300, 0.5*B300+0.5*F300)`

A	B	C	D	E
DIMES AND QUARTERS				
rows t, columns s	-100	-99	-98	-97
0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0

Probability

Represents the likelihood of winning (percentage) if you choose to flip a dime or quarter with that specific score and amount of turns left.

For example: In cell CS9, you can see that you have a score of -5 and 9 turns left. If you were to flip **ONLY** a dime in this instance, it would give you a 0.015625 or a 1.56% chance of winning.

fx $= (0.5 * CR8 + 0.5 * CT8)$

	CO	CP	CQ	CR	CS	CT
1						
2	-9	-8	-7	-6	-5	
3	0	0	0	0	0	
4	0	0	0	0	0	
5	0	0	0	0	0	
6	0	0	0	0	0	
7	0	0	0	0	0	
8	0	0	0	0	0	0.03125
9	0	0	0	0	0.015625	0.015625
10	0	0	0	0.0078125	0.0078125	0.0625
11	0	0	0.00390625	0.00390625	0.03515625	0.03515625

Which Coin to Flip?



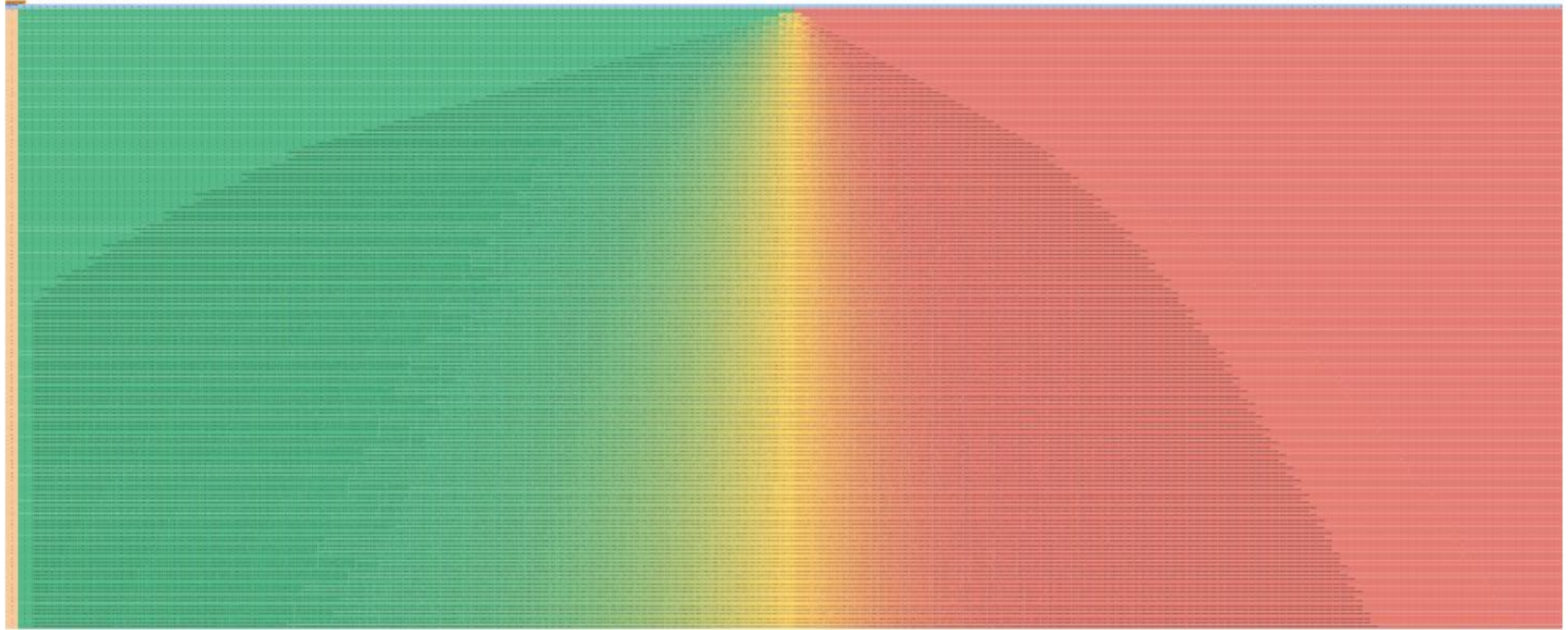
fx | =IF(MAX(Sheet1!D300)=Sheet1!D4,0,1)

	A	B	C	D	E
1	MAX of dimes and quarters				
2	rows t, column s	-100	-99	-98	-97
3	0	0	0	0	0
4	1	0	0	0	0
5	2	0	0	0	0
6	3	0	0	0	0

If the probability of flipping a dime and quarter are equal, Excel will display a “0”, but either coin would work

Graphics

Dimes and Quarter



The End

Thank you!

Any Questions?

Citations

[Coin Flip by Krishanpal Singh in 2020 | Animation design, Motion design, Coins \(pinterest.com\)](#)

[Coin Flip Stimulation Projects - Hei Sin Leung's Computer Science \(google.com\)](#)

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