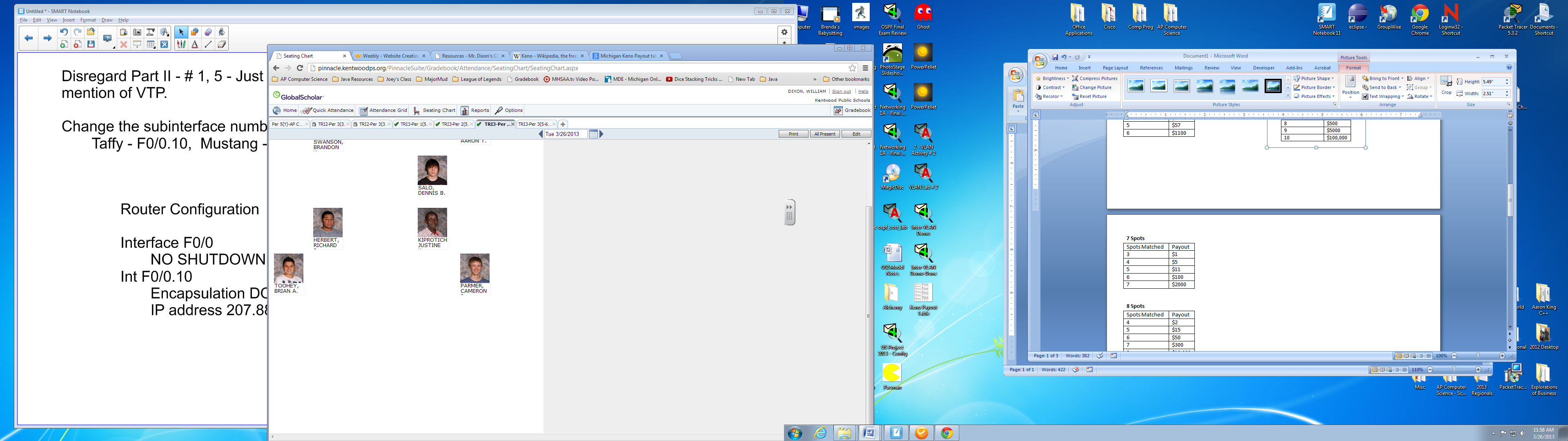
**AP Computer Science - Keno Project**

**100 Points**

Keno is a lottery gambling game offered by the Michigan State Lottery. The game is played with balls numbered from 1 to 80. Before each drawing players are permitted to select anywhere from 1 to 10 numbers (spots) to match. Based on the number of spots selected and the number of spots matched in the drawing, the player has a chance at a payout. Each drawing 20 balls (each with unique values) are randomly selected.

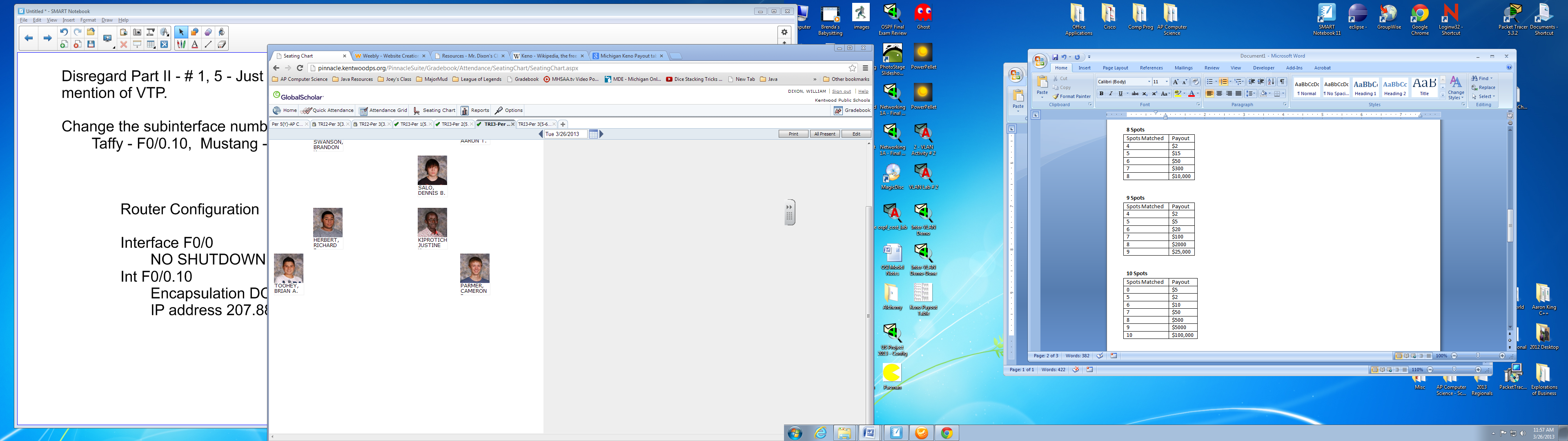
The payout schedule looks like this:

**1 Spot**

|  |  |
| --- | --- |
| Spots Matched | Payout |
| 1 | $2 |

**2 Spots**

|  |  |
| --- | --- |
| Spots Matched | Payout |
| 2 | $11 |



**3 Spots**

|  |  |
| --- | --- |
| Spots Matched | Payout |
| 2 | $2 |
| 3 | $27 |

**4 Spots**

|  |  |
| --- | --- |
| Spots Matched | Payout |
| 2 | $1 |
| 3 | $5 |
| 4 | $72 |

**5 Spots**

|  |  |
| --- | --- |
| Spots Matched | Payout |
| 3 | $2 |
| 4 | $18 |
| 5 | $410 |

**6 Spots**

|  |  |
| --- | --- |
| Spots Matched | Payout |
| 3 | $1 |
| 4 | $7 |
| 5 | $57 |
| 6 | $1100 |

**Program Features**

1. Your program should allow the user to enter in the number of spots and the number of games they wish to play.
2. The player should be allowed to enter in the specific numbers they want to play or "E" and the program will "Easy Pick" unique random numbers.
3. The program should then simulate the number of games specified in part 1.
4. Any games in which all of the user's numbers are matched, that program should output all twenty numbers that were selected in the console.
5. At the completion of the last game the following should be outputted:
   1. A nicely formatted table showing the number of times and % for each number of spots matched.
   2. The amount of money won or lost.
   3. Numbers of wins and losses
   4. The "hottest" number based on the frequency the numbers were picked.
   5. The "coldest" number, based on frequency. (Least frequently picked )
   6. The number of times they matched 0, 1….. X numbers.

**Sample Output**

How many games would you like to play?

1000

Ok. How many spots do you want to play?

4

Got it. Would you like (E)asy Pick or would you like to enter your own (N)umbers?

E

9 38 43 80 were selected for you

Results:

Keno numbers when winning maximum prize:

4 8 9 12 16 22 24 31 33 36 38 41 42 43 55 58 61 63 75 80

3 8 9 16 17 19 30 38 43 54 56 61 62 63 68 69 74 75 76 80

Wins: 257 Losses: 743

Earnings = $-429

You matched 0 numbers 342 times.

You matched 1 numbers 401 times.

You matched 2 numbers 212 times.

You matched 3 numbers 43 times.

You matched 4 numbers 2 times.

Hottest Number = 14

Coldest Number = 80

1 - 25.80% 2 - 24.80% 3 - 24.30% 4 - 23.80% 5 - 24.50%

6 - 22.70% 7 - 27.30% 8 - 24.90% 9 - 24.90% 10 - 25.60%

11 - 24.10% 12 - 24.80% 13 - 22.70% 14 - 28.70% 15 - 25.80%

16 - 27.20% 17 - 25.20% 18 - 27.00% 19 - 22.20% 20 - 25.90%

21 - 25.90% 22 - 26.70% 23 - 24.00% 24 - 27.10% 25 - 23.10%

26 - 23.90% 27 - 25.30% 28 - 24.70% 29 - 26.00% 30 - 25.90%

31 - 23.90% 32 - 24.80% 33 - 25.70% 34 - 25.40% 35 - 25.20%

36 - 25.40% 37 - 22.20% 38 - 24.00% 39 - 25.60% 40 - 25.30%

41 - 23.40% 42 - 24.40% 43 - 25.70% 44 - 23.90% 45 - 25.50%

46 - 25.20% 47 - 25.40% 48 - 26.00% 49 - 24.30% 50 - 26.20%

51 - 23.90% 52 - 25.70% 53 - 23.30% 54 - 25.10% 55 - 25.30%

56 - 24.90% 57 - 24.60% 58 - 25.00% 59 - 25.50% 60 - 25.10%

61 - 27.70% 62 - 24.90% 63 - 25.60% 64 - 24.10% 65 - 26.40%

66 - 23.80% 67 - 23.20% 68 - 25.80% 69 - 28.50% 70 - 26.00%

71 - 27.10% 72 - 24.40% 73 - 26.80% 74 - 23.40% 75 - 26.00%

76 - 23.50% 77 - 23.80% 78 - 24.20% 79 - 22.50% 80 - 21.60%