**Codebusters C – EXAM**



2021 Johns Hopkins Invitational

Team Number (on your wristband):

Team/School Name:

No abbreviations / PRINT LEGIBLY

Student Names (First & Last): PRINT LEGIBLY

1.

2.

3.

Total Points Possible: **3375**

Total Points Earned:

Team Number: School Name:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Question** | **Value** | **Incorrect letters** | **Deduction** | **Score** |
| Timed | 200 |  |  |  |
| 1 | 300 |  |  |  |
| 2 | 350 |  |  |  |
| 3 | 125 |  |  |  |
| 4 | 150 |  |  |  |
| 5 | 200 |  |  |  |
| 6 | 300 |  |  |  |
| 7 | 250 |  |  |  |
| 8 | 450 |  |  |  |
| 9 | 100 |  |  |  |
| 10 | 600 |  |  |  |
| 11 | 150 |  |  |  |
| 12 | 200 |  |  |  |
| **Bonus** |  |  | |  |
| **Final Score** |  | | | |

The following tables might be useful during the event.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** | **I** | **J** | **K** | **L** | **M** | **N** | **O** | **P** | **Q** | **R** | **S** | **T** | **U** | **V** | **W** | **X** | **Y** | **Z** |
| **A** | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |
| **B** | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A |
| **C** | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B |
| **D** | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C |
| **E** | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D |
| **F** | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E |
| **G** | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F |
| **H** | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G |
| **I** | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H |
| **J** | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I |
| **K** | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J |
| **L** | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K |
| **M** | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L |
| **N** | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M |
| **O** | O | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N |
| **P** | P | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O |
| **Q** | Q | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
| **R** | R | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q |
| **S** | S | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R |
| **T** | T | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S |
| **U** | U | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T |
| **V** | V | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U |
| **W** | W | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V |
| **X** | X | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W |
| **Y** | Y | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X |
| **Z** | Z | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** | **I** | **J** | **K** | **L** | **M** | **N** | **O** | **P** | **Q** | **R** | **S** | **T** | **U** | **V** | **W** | **X** | **Y** | **Z** |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** | **I** | **J** | **K** | **L** | **M** | **N** | **O** | **P** | **Q** | **R** | **S** | **T** | **U** | **V** | **W** | **X** | **Y** | **Z** |
| Z | Y | X | W | V | U | T | S | R | Q | P | O | N | M | L | K | J | I | H | G | F | E | D | C | B | A |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 3 | 5 | 7 | 9 | 11 | 15 | 17 | 19 | 21 | 23 | 25 |
| 1 | 9 | 21 | 15 | 3 | 19 | 7 | 23 | 11 | 5 | 17 | 25 |

|  |  |
| --- | --- |
| **AAAAA** | A |
| **AAAAB** | B |
| **AAABA** | C |
| **AAABB** | D |
| **AABAA** | E |
| **AABAB** | F |

|  |  |
| --- | --- |
| **AABBA** | G |
| **AABBB** | H |
| **ABAAA** | I/J |
| **ABAAB** | K |
| **ABABA** | L |
| **ABABB** | M |

|  |  |
| --- | --- |
| **ABBAA** | N |
| **ABBAB** | O |
| **ABBBA** | P |
| **ABBBB** | Q |
| **BAAAA** | R |
| **BAAAB** | S |

|  |  |
| --- | --- |
| **BAABA** | T |
| **BAABB** | U/V |
| **BABAA** | W |
| **BABAB** | X |
| **BABBA** | Y |
| **BABBB** | Z |

# Frequency Table of English letters:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E | - | 12.51% | S | - | 6.54% | C | - | 3.06% | G | - | 1.96% | K | - | 0.67% |
| T | - | 9.25% | R | - | 6.12% | U | - | 2.71% | W | - | 1.92% | X | - | 0.19% |
| A | - | 8.04% | H | - | 5.49% | M | - | 2.53% | Y | - | 1.73% | J | - | 0.16% |
| O | - | 7.60% | L | - | 4.14% | F | - | 2.30% | B | - | 1.54% | Q | - | 0.11% |
| I | - | 7.26% | D | - | 3.99% | P | - | 2.00% | V | - | 0.99% | Z | - | 0.09% |
| N | - | 7.09% |  |  |  |  |  |  |  |  |  |  |  |  |

Frequency Table of Spanish letters:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E | - | 14.08% | I | - | 5.98% | M | - | 3.08% | Y | - | 1.09% | Z | - | 0.47% |
| A | - | 12.16% | L | - | 5.24% | P | - | 2.89% | V | - | 1.05% | N | - | 0.17% |
| O | - | 9.20% | D | - | 4.67% | B | - | 1.49% | G | - | 1.00% | X | - | 0.14% |
| S | - | 7.20% | T | - | 4.60% | H | - | 1.18% | F | - | 0.69% | K | - | 0.11% |
| N | - | 6.83% | U | - | 4.69% | Q | - | 1.11% | J | - | 0.52% | W | - | 0.04% |
| R | - | 6.41% | C | - | 3.87% |  |  |  |  |  |  |  |  |  |

For the purposes of cryptograms it is customary to treat n and fi as distinct letters, but a and a are the same letter. Likewise for e and e, and i and f. In other words, all the accent marks get amputated when working with cryptograms. Also, while some older Spanish dictionaries consider ch, ll, and rr, to be their own letters-this has fallen out of modern usage. Accordingly, "burro" is considered as fve letters: "b-u-r-r-o" and not as four letters "b-u-rr-o."

Team Number: School Name:

Codebusters C JHSOI School:

Timed Question **[200 points]** Solve this aristocrat to reveal a quote from Albert Einstein. When you have solved it, raise your hand so that the

time can be recorded and the solution checked.

## YPEA PK YPXA ZPOPFJ U DPGSGYA. LT XAAN STMZ DUYUFGA,

**STM BMKL XAAN BTCPFJ.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** | **I** | **J** | **K** | **L** | **M** | **N** | **O** | **P** | **Q** | **R** | **S** | **T** | **U** | **V** | **W** | **X** | **Y** | **Z** |
| **Frequency** | 8 | 2 | 1 | 2 | 1 | 3 | 3 |  |  | 2 | 2 | 2 | 3 | 2 | 1 | 7 |  |  | 3 | 4 | 3 |  |  | 3 | 4 | 2 |
| **Replacement** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Team Number: School Name:

Codebusters C JHSOI

1. **[300 points]** Decode the message using the 2x2 Hill Matrix with the keyword PEAR

*A R* O 7

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| J | E | B | N | M | P | K | V | A | G | H | U |
|  |  |  |  |  |  |  |  |  |  |  |  |

1. **[350 points]** Solve this patristocrat with a K1 alphabet to reveal a famous quote in which the sequence **THING** appears twice

## PYXFT ECIMY HWAHG HEFXY HGHWC YOPTN YOIYA HWHMW

**HHYFL FITCY OPTN**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Kl** | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** | **I** | **J** | **K** | **L** | **M** | **N** | **O** | **P** | **Q** | **R** | **S** | **T** | **U** | **V** | **W** | **X** | **Y** | **Z** |
| **Frequency** | 2 |  | 3 |  | 2 | 4 | 2 | 9 | 3 |  |  | 1 | 2 | 2 | 3 | 3 |  |  |  | 4 |  |  | 4 | 2 | 8 |  |
| **Replacement** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Team Number: School Name:

Codebusters C JHSOI School:

1. **[125 points]** Decode this Caesar Cipher

Z

|  |  |  |  |
| --- | --- | --- | --- |
| C | F | M | V |
|  |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| V | E | T | F | U | Z | E | X |
|  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| G | C | R | Z | E | K | V | O | K |
|  |  |  |  |  |  |  |  |  |

|  |  |  |
| --- | --- | --- |
| R | E | U |
|  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| U | V | T | F | U | Z | E | X |
|  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| T | Z | G | Y | V | I | K | V | O | K |
|  |  |  |  |  |  |  |  |  |  |

1. **[150 points]** Decode this quote from philosopher Pythagorus using the Affne Cipher where a = 11 and b = 4

E

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| F | D | C | Q | S | D | F |
|  |  |  |  |  |  |  |

|  |  |
| --- | --- |
| O | U |
|  |  |

|  |  |
| --- | --- |
| E | R |
|  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| O | L | W | E |
|  |  |  |  |

|  |  |
| --- | --- |
| O | R |
|  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| F | J | E | R | U | O | F |
|  |  |  |  |  |  |  |

Team Number: School Name:

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1. **[200 points]** Encode the funny quote using the Vigenere Cipher with the keyword BRUH

I I

S

|  |  |
| --- | --- |
| I | T |
|  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| A | M | A | Z | I | N | G |
|  |  |  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| T | H | A | T |
|  |  |  |  |

|  |  |  |
| --- | --- | --- |
| T | H | E |
|  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| A | M | O | U | N | T |
|  |  |  |  |  |  |

|  |  |
| --- | --- |
| O | F |
|  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| N | E | W | S |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| T | H | A | T |
|  |  |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| H | A | P | P | E | N | S |
|  |  |  |  |  |  |  |

|  |  |
| --- | --- |
| I | N |
|  |  |

|  |  |  |
| --- | --- | --- |
| T | H | E |
|  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| W | O | R | L | D |
|  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| E | V | E | R | Y |
|  |  |  |  |  |

|  |  |  |
| --- | --- | --- |
| D | A | Y |
|  |  |  |

.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| A | L | W | A | Y | S |
|  |  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| J | U | S | T |
|  |  |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| E | X | A | C | T | L | Y |
|  |  |  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| F | I | T | S |
|  |  |  |  |

|  |  |  |
| --- | --- | --- |
| T | H | E |
|  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | E | W | S | P | A | P | E | R |
|  |  |  |  |  |  |  |  |  |

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1. **[300 points]** Decode this aristocrat using a K2 alphabet to reveal a quote from a Marvel movie

## MLZJZ'K FG MLJGFZ, MLZJZ AK FG PZJKAGF GD MLAK,

**QLZJZ TGN XGEZ GNM GF MGH.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Replacement** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **K2** | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** | **I** | **J** | **K** | **L** | **M** | **N** | **O** | **P** | **Q** | **R** | **S** | **T** | **U** | **V** | **W** | **X** | **Y** | **Z** |
| **Frequency** | 3 |  |  | 1 | 1 | 5 | 10 | 1 |  | 5 | 4 | 5 | 6 | 2 |  | 1 | 1 |  |  | 1 |  |  |  | 1 |  | 9 |

Team Number: School Name:

Codebusters C JHSOI School:

1. **[250 points]** Solve this Baconian Cipher to reveal the message

## LABOR ERICA MAYBE RANGE ISAAC THERE DEPOT ANGUS CLYDE

**LOANS BORIS PLACE MOCHA HENCE PABLO GNOME LUNAR THERE**

**CAIRO WHACK FINCH CHECK GOATS TALKS**

1. **[450 points]** Decode this aristocrat to reveal a quote from football quarterback Tom Brady

## E SQEKB UFRWSERWU EK JELW SQW PETTWUS AQIJJWKTWU WKH

**YZ PWEKT SQW PWUS SQEKTU SQIS QIZZWK EK OFYV JELW.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** | **I** | **J** | **K** | **L** | **M** | **N** | **O** | **P** | **Q** | **R** | **S** | **T** | **U** | **V** | **W** | **X** | **Y** | **Z** |
| **Frequency** | 1 | 1 |  |  | 10 | 2 |  | 1 | 3 | 4 | 8 | 2 |  |  | 1 | 3 | 7 | 2 | 9 | 5 | 6 | 1 | 13 |  | 2 | 3 |
| **Replacement** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Team Number: School Name:

Codebusters C JHSOI

1. **[100 points]** Solve this sequence using the Atbash Cipher to reveal a quote from Martin Luther King Jr

|  |  |  |
| --- | --- | --- |
| L | F | I |
|  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| O | R | E | V | H |
|  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Y | V | T | R | M |
|  |  |  |  |  |

|  |  |
| --- | --- |
| G | L |
|  |  |

|  |  |  |
| --- | --- | --- |
| V | M | W |
|  |  |  |

|  |  |  |
| --- | --- | --- |
| G | S | V |
|  |  |  |

|  |  |  |
| --- | --- | --- |
| W | Z | B |
|  |  |  |

|  |  |
| --- | --- |
| D | V |
|  |  |

.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Y | V | X | L | N | V |
|  |  |  |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| H | R | O | V | M | G |
|  |  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Z | Y | L | F | G |
|  |  |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| G | S | R | M | T | H |
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| G | S | Z | G |
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| --- | --- | --- | --- | --- | --- |
| N | Z | G | G | V | I |
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1. **[600 points]** Solve this Xenocrypt

## EM BDNDC IPJP UPRPEP OM KTD ITDBPC FPZDJ FMX.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** | **I** | **J** | **K** | **L** | **M** | **N** | **N** | **O** | **P** | **Q** | **R** | **S** | **T** | **U** | **V** | **W** | **X** | **Y** | **Z** |
| **Frequency** |  | 2 | 2 | 5 | 2 | 2 |  |  | 2 | 2 | 1 |  | 3 |  | 1 | 1 | 7 |  | 1 |  | 2 | 1 |  |  | 1 |  | 1 |
| **Replacement** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Team Number: School Name:

Codebusters C JHSOI School:

1. **[150 points]** Encode the following text using Affne Cipher with a = 3 and b = 7

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|  |  |
| --- | --- |
| I | T |
|  |  |

|  |  |
| --- | --- |
| I | S |
|  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| I | M | P | O | R | T | A | N | T |
|  |  |  |  |  |  |  |  |  |

|  |  |
| --- | --- |
| T | O |
|  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| E | N | C | R | Y | P | T |
|  |  |  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| T | H | I | S |
|  |  |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| M | E | S | S | A | G | E |
|  |  |  |  |  |  |  |

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1. **[200 points]** The following message requires encryption using the Vigenere Cipher with a keyword of SIMPLE

|  |  |  |  |
| --- | --- | --- | --- |
| T | H | E | P |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| A | C | K | A |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| G | E | W | I |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| L | L | B | E |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| D | E | L | I |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| V | E | R | E |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| D | T | O | M |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| O | R | R | O |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| W | M | O | R |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| N | I | N | G |
|  |  |  |  |