ACSL

American Computer Science League

**All-Star #4**

**008 2015 - 2016**

**ACSL UUENCODE**  
   
  
**PROBLEM**: **PHP** is a server-side scripting language created in 1995 and designed for web development but also used as a general-purpose programming language. PHP was created by Rasmus Lerdorf . While PHP originally stood for *Personal Home Page*, it now stands for *PHP: Hypertext Preprocessor.*

PHP has a long list of functions that operate on string data. For this program you will be asked to code the algorithm that replicates the **uuencode** function. The name **uuencode** is derived from "Unix-to-Unix encoding". The mechanism of uuencoding repeats the following for every 3 bytes:

1. Convert each character to its ASCII decimal value.
2. Convert the decimal value to its 8 bit binary value.
3. Split into 6-bit groupings, each representing a value in the range 0 to 63.
4. Add 32 to each of the values. With the addition of 32 the possible results will be between 32 (" " space) and 95 ("\_" underline). If the result is a 32 print a "~" ASCII 126 to show the space.
5. Output the ASCII equivalent of these values.

If the given string length is not divisible by 3 then add zeros to the end of the string to make it divisible by 3.

The encoding process is demonstrated by this table, which shows the derivation of the above encoding for Cat.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Original characters | **C** | | | | | | | | **a** | | | | | | | | **t** | | | | | | | |
| Original ASCII, decimal | **67** | | | | | | | | **97** | | | | | | | | **116** | | | | | | | |
| ASCII, binary | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 |
| New decimal values | **16** | | | | | | **54** | | | | | | **5** | | | | | | **52** | | | | | |
| +32 | **48** | | | | | | **86** | | | | | | **37** | | | | | | **84** | | | | | |
| Uuencoded characters | **0** | | | | | | **V** | | | | | | **%** | | | | | | **T** | | | | | |

**INPUT**: There will be 10 lines of input. Each line will contain a character string of fewer than 100 characters.

**OUTPUT**: Using the algorithm above, print the uuencoding for the given string.  
  
**SAMPLE INPUT SAMPLE OUTPUT**  
1. Cat 1. 0V%T  
2. tiger 2. =&EG97(P  
3. Cats 3. 0V%T<S~P  
4. Mathematics 4. 36%T:&5M871I8W,P  
5. String Data 5. 4W1R:6YG($1A=&$P   
6. PHP 6. 4$A0  
7. ACSL! 7. 04-33"$P  
8. division 8. 9&EV:7-I;VXP  
9. May 2016 9. 36%Y(#(P,38P  
10. Test Output 10. 5&5S="!/=71P=70P

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**TEST DATA**

**TEST INPUT TEST OUTPUT**  
1. dog 1. 9&]G  
2. Java 2. 2F%V83~P  
3. Python 3. 4'ET:&]N  
4. Computer 4. 0V]M<'5T97(P  
5. Invitational 5. 26YV:71A=&EO;F%L  
6. winner! 6. =VEN;F5R(3~P  
7. New Hampshire 7. 3F5W($AA;7!S:&ER93~P  
8. Graph Theory 8. 1W)A<&@@5&AE;W)Y  
9. Laptop 9. 3&%P=&]P  
10. //REMARK// 10. +R]214U!4DLO+S~P