

The secret service has intercepted an encoded message. Mathematicians have managed to find the key to decode the message.

They have found that the bits of each character (size: 1 byte) have been written at various places in a 32 bit variable. Each byte is encrypted in the same way (bit numbers start from 0, bit 0 is LSB - Least Significant Byte):

- Bit 0 of the original message is written to bit 9 of the encoded message
- Bit 1 of the original message is written to bit 14 of the encoded message
- Bit 2 of the original message is written to bit 15 of the encoded message
- Bit 3 of the original message is written to bit 2 of the encoded message
- Bit 4 of the original message is written to bit 3 of the encoded message
- Bit 5 of the original message is written to bit 4 of the encoded message
- Bit 6 of the original message is written to bit 31 of the encoded message
- Bit 7 of the original message is written to bit 26 of the encoded message

The mathematicians have created a struct for you that contains the encoded message:

```
uint32_t array[382] =
{
    0x49E94D85, 0xF06517E3, 0xCA40F1D4, 0xD9DB379D, 0xE298AC1A, 0xA1B51834, 0xC18136D7, 0xA236F857, 0xC296E792, 0x40B62091,
    0xA2D4BCD8, 0xD9391076, 0xC1CC3FB1, 0xD8D39D3A, 0x190F3DD1, 0x81613417, 0xE1DB3A53, 0xB10F115A, 0xF10E3C5B, 0x9AED9EB3,
    0xD164CD74, 0x9BAC52B8, 0x4A65D935, 0x70AE0D90, 0xE0BD30B7, 0xC0CA3AB0, 0xA8B73CDB, 0xC2E72598, 0xE1BDBBD0, 0x9B5FCCB7,
    0xF9BE57DA, 0x4B0D95F4, 0x48174986, 0x71655507, 0xC09F0F42, 0xC2F8EC54, 0xCB2417FE, 0xDA88B8B9, 0xC2141456, 0xF1132A37,
    0xC20CF8F4, 0xB0EDEA10, 0x32CA3D10, 0xFBF498B8, 0xE36F1CF7, 0xB05C2E72, 0xF366B55B, 0x6875DDF5, 0x096A3D0D, 0xD3803BD5,
    0xA3D5F414, 0x02CC0C71, 0xB2AA35B6, 0xD1161BB2, 0x99F2255A, 0x80F619BA, 0xDA66BF11, 0xB889DCD5, 0xF2C43296, 0xE00EF457,
    0xD177E291, 0x1066C015, 0x190F2550, 0xD22C66D2, 0xD0A80F33, 0xFAB7AE3B, 0x8BB7473A, 0xB93AB251, 0xA82573F9, 0x3A773513,
    0x80C0627B, 0x92CEDBD5, 0xB9D6BF34, 0xB1398E92, 0xA8D3A519, 0xBA282137, 0xD9720EF6, 0xFB9FED17, 0x8BC7EF51, 0x7A467CC6,
    0xD212A752, 0xE22394B7, 0x9AE05BBB, 0xAB88BB73, 0x194328F1, 0xA032A819, 0x8A1DEE34, 0x221515B0, 0xB3183497, 0xA28922B3,
    0x812C2039, 0xB1492DDA, 0xD35D8612, 0xA822F1D5, 0x7974E135, 0x68690072, 0xE2F27B53, 0xA8902652, 0xB08AEF8, 0xE3164E58,
    0xD87FBB33, 0x98F07FF9, 0x406E0991, 0xB18C7FB8, 0xBBE6D757, 0x9BD59716, 0x8B9593D2, 0xA11D9538, 0xC99819F5, 0xB1BD1796,
    0x81C0C9D5, 0x93ADEED2, 0x5B483451, 0x9A359E12, 0xC131BC74, 0xA8CE5318, 0xA285AA32, 0x014F3C53, 0x9101ADDA, 0x9157E294,
    0x00093011, 0x88F23194, 0xF1131F33, 0x9A612CD8, 0x8A2F21F9, 0xE9968211, 0x9834D9B7, 0x10E8A8B7, 0x43085C46, 0x72687DE4,
    0xC2230FA3, 0xB3C1C036, 0xF05916DE, 0x89368CDA, 0xD8552477, 0xDA520B34, 0xE131F137, 0xE098D2F2, 0x4BEA3172, 0x8942ACFA,
    0x807F0977, 0xE2052F53, 0xF320947B, 0x3BA0C5D5, 0x22E00831, 0xA2BD2AD6, 0xB0C5D017, 0x5A222090, 0x93DF10D7, 0xE3030713,
    0xA8E109B, 0x8948097A, 0xA2278612, 0xF8B5F0D7, 0xE8880E77, 0x89A9D114, 0xBAA0FF10, 0x6A04E915, 0x00611191, 0xA21C4312,
    0xD9090BD0, 0x99359FD8, 0xBBF75B1B, 0x88CB8693, 0x81EE5639, 0x51F641C5, 0xE9F232F4, 0xC3D7A8D8, 0xABF34759, 0xA9A2AF73,
    0x93ABB5D5, 0xEAB1C471, 0x239908F1, 0xE153801A, 0xA094D655, 0x7B151CB0, 0xC3E43135, 0xD2DA2F92, 0xBB260C9A, 0xEB703979,
    0x90CCA772, 0xF39AF174, 0x388C24D0, 0xB21A3A32, 0x90B2EBF2, 0xB8DE12D3, 0xC8E60FB5, 0x83F6C4D7, 0x59F6C9F6, 0x28071D12,
    0xEB0100D5, 0xB03426D1, 0xD03134B8, 0xEB4C3159, 0x900EBE91, 0xC312D0B4, 0xD30367FA, 0x310A0153, 0x98460B50, 0xCB49EB13,
    0xE8F83333, 0x9AEB1E75, 0xE2EBC015, 0x32529577, 0x4BD04424, 0x73025D66, 0xB8C62724, 0x811D9178, 0x43D02493, 0xD3648552,
    0xC81AF617, 0xE9A5B331, 0x999856D8, 0xF051F0D4, 0x1399B350, 0xAA598CB9, 0x38CF01B3, 0xDB4FC1D5, 0xB068A3F0, 0x808D7310,
    0xD20F8751, 0xE9144799, 0xB2646B58, 0xEAA40B30, 0x80956DB8, 0xFABC3B95, 0xA8A398F4, 0x98FA1F3C, 0x09681D11, 0xC385B172,
    0xE9DDE337, 0x51332832, 0xF1962377, 0xD3708C98, 0x72347407, 0xF2871BD4, 0x9018D8D6, 0x5B5C1950, 0x886E4B70, 0x882D1C74,
    0x82FC515B, 0xC011DF16, 0xC062FD76, 0x89AFE3D5, 0xE159B9F7, 0xD1D9CB14, 0xC922FB50, 0x92491634, 0x989C52D1, 0xFB542BD3,
    0xE374AD96, 0x60DB3D0D, 0xD2E5E755, 0xDA7B7538, 0xFBD1B491, 0xE3D4AA50, 0x8A0C4D78, 0x5A99F574, 0x31C03890, 0xE0169038,
    0xF0ED0475, 0xA281EFF4, 0xFB56AE1B, 0xF3BFE753, 0xC37E1D34, 0x39148497, 0x51365CE7, 0x48934D24, 0x5B8368E5, 0x9BF4D080,
    0xB06D797A, 0xFB43DA15, 0x9ACF9BF5, 0x3B1B783C, 0x41C91992, 0xB27D8989, 0xDB6A35D5, 0xCBAF8ED2, 0x03311490, 0x982C14C7,
    0x928C37F4, 0xC0129CBB, 0x81167633, 0xD8C014B7, 0xAAC80D76, 0xD0C713D4, 0xEB225F96, 0xA9428AD2, 0xDB8D619B, 0x3AFFDFB3,
    0xC2F56A7B, 0x1AF13931, 0xEADEFE11, 0xE1099E98, 0x99B21FF5, 0xB99BAC12, 0xFAE9A2D1, 0x00C21192, 0xE268A1D9, 0xCB73F215,
    0x23C31973, 0xFB12AD58, 0xA3333435, 0x937B8F11, 0x10171D52, 0xD984F622, 0xC3B81631, 0xEA32A9D6, 0xA0B13252, 0x8A30291C,
    0xF85D3BFE, 0x49090413, 0xB8A961B0, 0x806616FD, 0x4A6B21D0, 0xBBFFA4A3, 0x98AECBF4, 0xEB689A18, 0xB8F0CF2F, 0xD1CC8C75,
    0xD3B007F0, 0x93164A9A, 0x48E135D1, 0xCA012780, 0x9148B051, 0x9A5A1370, 0x8B31B374, 0x93DF6ABB, 0x69A5BD97, 0x085A4426,
    0x9B025880, 0xC3EEDFF6, 0xF25AE656, 0xA9CA5FF5, 0x416229F3, 0xC16EF0D2, 0xE29F2336, 0xD9C0E0B8, 0x826E8791, 0x21B13D53,
    0x98011395, 0xAAFDE034, 0x020B0CD1, 0xD0AF91FB, 0xD31A21F4, 0x91586D3, 0x62ED2152, 0xEB64813B, 0x8A8D419B, 0xCB653737,
    0xF1F08554, 0xE244D634, 0xB14DF390, 0xC2F30B7D, 0x62740811, 0xC0A9CFF6, 0xC811F950, 0x30023DD0, 0x90E5F570, 0xF0ED2A97,
    0xABC5E01A, 0xD814AAD2, 0x2073797F, 0x093F3153, 0xC17CBF07, 0x80E3D775, 0xD967679B, 0x9B568D39, 0xDAE59C15, 0xA8D1037E,
    0x31B90C31, 0xEBCE2407, 0xF2143ED2, 0xAB2A54DA, 0xF910B755, 0xB8729C57, 0xD88EBA10, 0x99D85F39, 0xE84D7ED9, 0x33C28576,
    0x237669E7, 0x53FA6945
};
```

Please write a program that decodes this message. It's too tedious to do manually. If you decode each 32 bit number and put the decoded byte into a char array, you should now have readable text.

However, there appears to be something wrong in the text... To fix this, follow these instructions on :

- IF bit 6 in your decoded byte is 0, AND bits 2 + 3 in your decoded bytes are 1
- THEN invert bit 1

Good Luck!