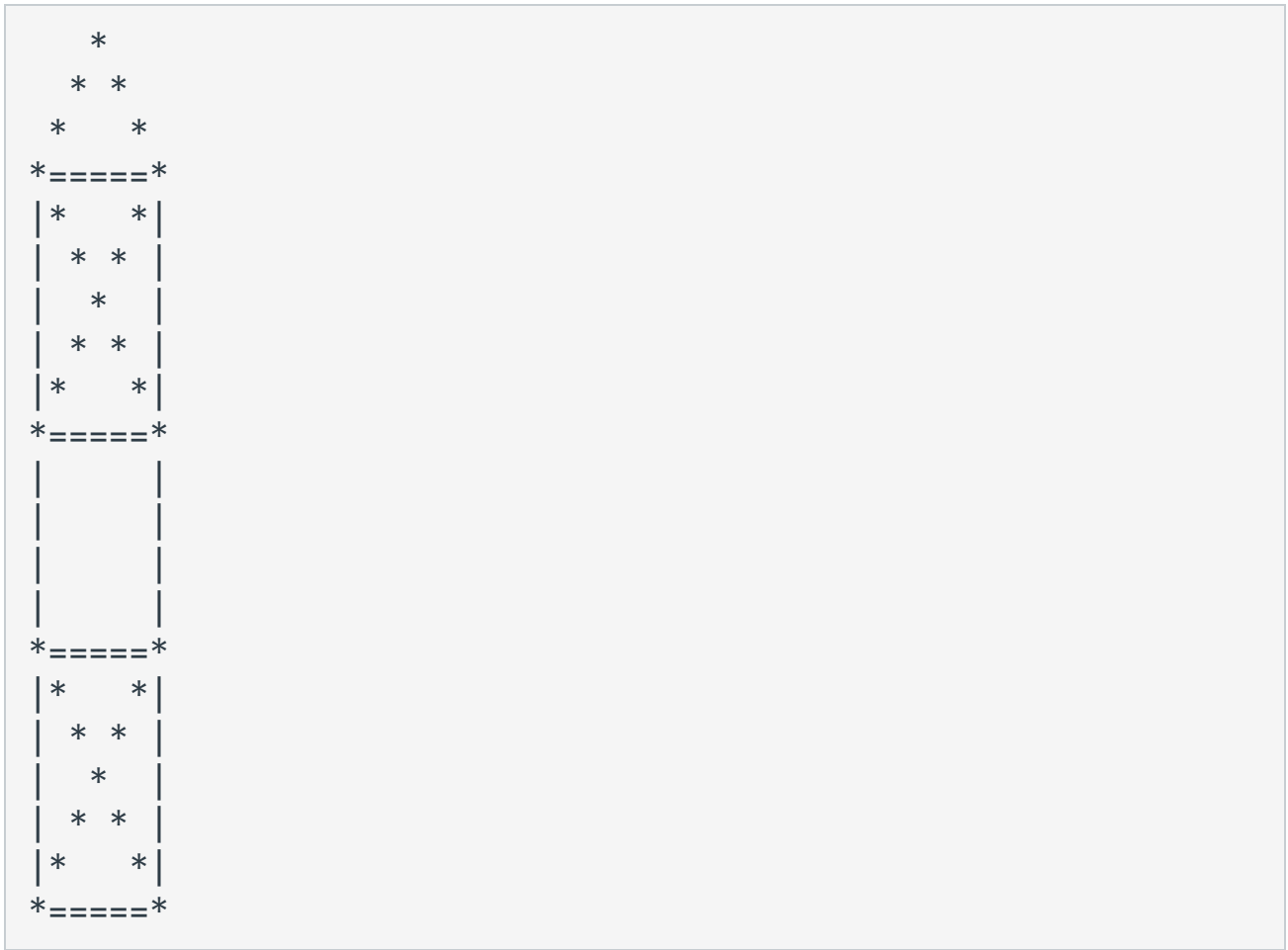
CMPS 4143

Programming Assignment-3 (Due October 27th 11:59 PM)

[*To get the full credit of your programming assignment, find the problem solving steps and documentation guidelines listed in 'Programming Assignments' section in D2L. You are supposed to submit a zip file (don't use winrar to zip) that should contain a documentation file like a docx file and your codes with proper programming extensions like .java or .py. Make sure all of your code is compliable or no runtime error.TA will not grade you if your code is not runnable and get a zero***]**

1. Write a Python program to draw a three-stage rocket. Here is mine - make yours **different**! (25points)



2. Write a program where it asks to enter the number of people, then based on this number iterate that amount of time where each time get single person's information like First Name, Last Name, Age, Occupation and Address. Make sure you validate all users' input. Included but not limited to like age cannot be a non-numeric value should be between 0-150, name can only be non-numeric. **You need to think** how you can validate the occupation and address field. Finally show (print) user details one by one. For your input validation, make sure you can't proceed next step/value without inserting valid input on current phase. (35 points)

   Sample Input/ Output:

   How many people to enter?
   2

   First Name of 1st person?
   Saikat
   Last Name of 1st person?
   D123
   Invalid Input, insert last name of 1st person again
   Das
   Age of 1st person?
   200
   Invalid Input, insert correct age for 1st person.
   75
   Occupation of 1st person?
   Faculty
   Address of 1st person?
   3410 Taft Blvd, Wichita Falls, TX, 84112

   First Name of 2nd person?
   John
   Last Name of 2nd person?
   Doe
   Age of 1st person?
   25
   Occupation of 1st person?
   Student
   Address of 1st person?
   3410 Taft Blvd, Wichita Falls, TX, 84112

   Output:
   Saikat Das, aged 75 years, worked as a faculty lives in 3410 Taft Blvd, Wichita Falls, TX, 84112.
   John Doe, aged 25 years, worked as a student lives in 3410 Taft Blvd, Wichita Falls, TX, 84112.

3. Implement the `myAtoi(string s)` function, which converts a string to a 32-bit signed integer (similar to C/C++'s `atoi` function). (40 points)

   The algorithm for `myAtoi(string s)` is as follows:

   a) Read in and ignore any leading whitespace.
   b) Check if the next character (if not already at the end of the string) is `'-'` or `'+'`. Read this character in if it is either. This determines if the final result is negative or positive respectively. Assume the result is positive if neither is present.
   c) Read in next the characters until the next non-digit character or the end of the input is reached. The rest of the string is ignored.
   d) Convert these digits into an integer (i.e. `"123" -> 123`, `"0032" -> 32`). If no digits were read, then the integer is `0`. Change the sign as necessary (from step 2).
   e) If the integer is out of the 32-bit signed integer range $[-2^{31}, 2^{31} - 1]$, then clamp the integer so that it remains in the range. Specifically, integers less than -2^{31} should be clamped to -2^{31}, and integers greater than $2^{31} - 1$ should be clamped to $2^{31} - 1$.
   f) Return the integer as the final result.

   Note:

   - Only the space character `' '` is considered a whitespace character.
   - **Do not ignore** any characters other than the leading whitespace or the rest of the string after the digits.

Sample Input/ Output:

Input1: "42" **Output1**: 42

Input1: "+45" **Output1**: 45

Input2: " -42" **Output2**: -42

Input3: "4193 with words" **Output3**: 4193

Input4: "Words with 4856" **Output4**: 4856

Input5: "-91283472332" **Output5**: - 2147483648

Input6: "4294967296" **Output6**: 2147483647