**Logo

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**San Francisco Bay University**

**Programming in C Language**

**Homework Assignment #1**

**Due day: 6/3/2023**

**Instruction:**

1. **Push the source code to Github or piazza platform.**
2. **Please follow the code style rule like programs on handout.**
3. **Overdue homework submission could not be accepted.**

**4. Takes academic honesty and integrity seriously (Zero Tolerance of Cheating & Plagiarism)**

1. Write a program to read-in numbers (integer) from keyboard and save them to an array, and then sort them ascendingly by bubble sorting method. After that, print them out.

*Output*

*Enter a number of array’s size for a series of numbers saving: 5*

*Enter a series of numbers: 5 6 2 7 1*

*After sorting, output sequence: 1 2 5 6 7*

2. It is similar to the above question, and just print ascendingly sorted odd numbers first and followed by sorted even numbers.

*Output*

*Enter a number of array’s size for a series of numbers saving: 5*

*Enter a series of numbers: 5 6 2 7 1*

*After sorting, output sequence: 1 5 7 2 6*

3. If there is a pancake and taking one cut, it will become 2 pieces. Of course, taking two cuts will create 4 pieces. Write a program to calculate how many pieces can be gotten if taking n cuts.

*Output*

*Enter how many cuts you want: 2*

*Pieces will be: 4*

*Output*

*Enter how many cuts you want: 3*

*Pieces will be: 7*

4. Write a program to calculate how many *1*s is for a decimal number as input arguments

*Output*

*Enter decimal number: 15*

*There are 4 ones in given decimal number*

Notice that *15*’s binary number is *1111*

5. There is a kind of bacterium with two sub-species A and B. They are very similar and difficult to differentiate, but the major difference between them is capability of reproduction. And reproduction in A is much stronger than that of B. Assuming that in a research center, researcher massed up Petri dishes with A and B bacterium, write a program to find which one is A, and which one is B in terms of each reproduction rate, given that reproduction rate is the ratio of new number of bacteria to original number after one hour (PR = new bacterial number / original bacterial numbers). Because of the huge different reproduction rate, it means that the difference of PR in any two Petri dishes belonging to the same sub-species is extremely smaller than that in any two Petri dishes belonging to the different sub-species.

*Output*

*Enter total number of Petri dishes: 5*

*Enter Petri dish label, original bacterial number, new bacterial number*

*after one hour reproduction:*

*1 10 3456*

*2 10 5644*

*3 10 4566*

*4 20 234*

*5 20 232*

*Running results:*

*3 in A* sub-species *and Petri dish labels from smaller PR to bigger PR are 1 3 2*

*2 in B* sub-species *and Petri dish labels from smaller PR to bigger PR are 5 4*