Attempt all questions :

Q1. Write a MIPS assembly for the following C codes :

a.

```
int a, b, result
int main(){
    a = 0x12345;
    b = 7;
    result = a + b;
    return 1;
}
```

b.

```
 int i;
int b[500];
int a[500];
for(i=0; i < 500; i++) {
 b[i] = a[a[i]];
}
```

 In each case check whether you have generated the correct assembly by "cross-compiling" the c –
code for MIPS architecture.

[Hint : You will need a gcc tool chain for cross compilation - in ubuntu you can get it using :

sudo apt-get install --install-recommends gcc-mips-linux-gnu cpp-mips-linux-gnu

Once the tool chain is installed search the internet to learn how to cross-compile a code for or a
target processor (MIPS in this case)]

Q2. The Fibonacci Sequenceis the series of numbers: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34,. . .. Any number
in the series is found by adding up the two numbers before it.Write a MIPS program to perform the
following: Given a positive integer $0 \leq n \leq 20$, store the first n numbers of the Fibonacci series in
memory and print them.

Q3. Write a MIPS program to compute the factorial of a positive number (>1). Use a subroutine
call from main to compute the factorial. Use iterative method of factorial computation.

Q4. *Binary Search* is an algorithm to search a value in a sorted array by repeatedly dividing the search interval in half. Begin with an interval covering the whole array. If the value of the search key is less than the item in the middle of the interval, narrow the interval to the lower half. Otherwise narrow it to the upper half. Repeatedly check until the value is found or the interval is empty. (NISTDefinition)Suppose that a sorted array of positive integers is stored in the memory. Write a MIPS program that accepts a positive integer from a user and returns the leftmost index of the element in the array if the element is present in the array. Otherwise, the program returns−1

Q5. Write a MIPS program to multiply two matrices. The two matrices are stored in the memory as two dimensional array in row-major order. The elements of the matrices are given in double-precisionfloating point format. Store the result matrix in the memory and print it.