**浙江大学2022–2023学年夏学期**

**《 生物信息学》课程期终作业**

课程号： \_\_\_\_，开课学院：\_\_\_ 农学院 \_\_\_

提交日期： 年 月 日

**学生姓名： 学号： 所属院系：**

|  |  |
| --- | --- |
| **得分** |  |
| **评语** |  |
| **评卷人** |  |

**作业的任务要求（选题范围等）：**

实验课内容

**“Bioinformatics” homework for undergraduate** (202306)

#1

How many nucleotide sequences from maize (*Zea mays*) with the length of 100-200bp have been stored in the public DNA database (such as GenBank)? How to download these sequences?

#2

A sequence was generated by a suppression subtractive hybridization (SSH) experiment. Please find the best hit of the unknown sequence in the public database and predict its potential function.

>an unknown sequence

CCTCGGAGATCTTCATGGGGGGCAAGAGCACCATCGTGCTgCACAACACCTGCGAGGACTCGCTCCTC GCTGCACCCATCATTCTTGATCTGGTGCTCCTGGCGGAGCTCAGCACCAGGATTCAGCTGAAGGCCGA GGGAGAGGTAAGAGTCTGACGAGATATGTTGCTAGTCTACTCTGTAGTCGAGATATACTTTGGGAGCCA AACTGAAGATTTCGCTGCTCCACTTGCATTTGTGCAGGACAAGTTCCATTCCTTCCATCCGGTTGCCAC CATCCTGAGCTACCTCACCAAGGCACCCCTGGTAAGAAACAATTCTCGACTGTTTGCTCTAAATAACCT ATAGATAAATAAAGACGATTAACTGACGTGCCACTGAATTCCTCTGTTAACAGGTTCCTCCTGGCACGC CGGTGGTGAACGCCCTGGCGAAGCAAAGGGCGATGCTGGAGAACATCATGAGGGCGTGTGTCGGCCT GGCGCCCGAAAACAACATGATCCTGGAGTACAAGTGAGGAGCGTGGCCCAAGCTCGCGGAGCCGAG AGCGACCGTACGTACGTAGCAAGTGGCGAGGGGCGACGGGAGGGCAGGACGAAGAAGAAGGCGAG ATCGGCTGTGGAATTATTTGGCGGCTTGTCTTTAGTTTCCTTTGCGAATCTTTCCCTGGTTAAGTTTACC CCAGTGAGTGTGTGTCCTTGCGAGAAAAG

#3

Search Ath-MIR156a in a plant miRNA database and obtain its stem-loop sequence, mature sequence and star sequence, and predict the target of Ath-MIR156a.

#4

Please find genes in a genomic segment of rice (NCBI accession: AC093181.5) using FGENESH and compare the result to the annotation from GenBank itself.

#5

Please download protein sequences of *Arabidopsis thaliana* *NHX* genes, perform multiple sequence alignment and predict the protein domains of AtNHX1 and AtNHX7.

#6

Construct a phylogenetic tree for the above eight *NHX* genes.

要求：

1）每题作业需要标明所使用的软件、数据库、方法或参数等，第1题还需标明搜索日期。

2）不得抄袭，一旦发现，两人均为0分

3）请于2023年6月22日23:59前发至bioinplant@zju.edu.cn (无需纸质版)，邮件主题写明“本科生信作业”