**REPORT FOR THE FINAL PRACTICE**

**Advanced level**

For this last level we had to give the user the option to get the information in a json format by turning the previous user API into an REST API. For trying our server in this level, we had to create our own client that could receive the response from the server, which had to test each endpoint in the server through a certain resource. Below I am going to test every endpoint in the program (the ones from the basic level and also the ones from the medium level) for obtaining a json format response. Note that the “/listSpecies” endpoint will be tested twice (with the limit parameter).

/listSpecies

Browser’s url: <http://127.0.0.1:8000/listSpecies?limit=&json=1>

json code from the returned result:

["Mouse - mus\_musculus", "Human - homo\_sapiens", "Guinea Pig - cavia\_porcellus", "Mouse CBA/J - mus\_musculus\_cbaj", "Midas cichlid - amphilophus\_citrinellus", "Anole lizard - anolis\_carolinensis", "Capuchin - cebus\_capucinus", "Ballan wrasse - labrus\_bergylta", "Leopard - panthera\_pardus", "Fugu - takifugu\_rubripes", "Black snub-nosed monkey - rhinopithecus\_bieti", "Zig-zag eel - mastacembelus\_armatus", "Blue-crowned manakin - lepidothrix\_coronata", "Damara mole rat - fukomys\_damarensis", "Opossum - monodelphis\_domestica", "Donkey - equus\_asinus\_asinus", "Platyfish - xiphophorus\_maculatus", "Little spotted kiwi - apteryx\_owenii", "Ruff - calidris\_pugnax", "Stickleback - gasterosteus\_aculeatus", "Chinese hamster PICR - cricetulus\_griseus\_picr", "Steppe mouse - mus\_spicilegus", "Indian medaka - oryzias\_melastigma", "Upper Galilee mountains blind mole rat - nannospalax\_galili", "Abingdon island giant tortoise - chelonoidis\_abingdonii", "Spiny chromis - acanthochromis\_polyacanthus", "Asian bonytongue - scleropages\_formosus", "Tasmanian devil - sarcophilus\_harrisii", "Chicken - gallus\_gallus", "Coelacanth - latimeria\_chalumnae", "Helmeted guineafowl - numida\_meleagris", "Mouse A/J - mus\_musculus\_aj", "Sailfin molly - poecilia\_latipinna", "Koala - phascolarctos\_cinereus", "Mouse FVB/NJ - mus\_musculus\_fvbnj", "Chinese hamster CHOK1GS - cricetulus\_griseus\_chok1gshd", "Mouse LP/J - mus\_musculus\_lpj", "Naked mole-rat female - heterocephalus\_glaber\_female", "Spoon-billed sandpiper - calidris\_pygmaea", "Duck - anas\_platyrhynchos\_platyrhynchos", "Bolivian squirrel monkey - saimiri\_boliviensis\_boliviensis", "Bengalese finch - lonchura\_striata\_domestica", "Marmoset - callithrix\_jacchus", "Sheep - ovis\_aries", "Olive baboon - papio\_anubis", "Crab-eating macaque - macaca\_fascicularis", "Mainland tiger snake - notechis\_scutatus", "Goat - capra\_hircus", "Mummichog - fundulus\_heteroclitus", "American black bear - ursus\_americanus", "Mouse NZO/HlLtJ - mus\_musculus\_nzohlltj", "Wallaby - notamacropus\_eugenii", "Dolphin - tursiops\_truncatus", "Western mosquitofish - gambusia\_affinis", "Cat - felis\_catus", "Bonobo - pan\_paniscus", "Gibbon - nomascus\_leucogenys", "Vervet-AGM - chlorocebus\_sabaeus", "Cow - bos\_taurus", "Clown anemonefish - amphiprion\_ocellaris", "Shrew mouse - mus\_pahari", "Japanese quail - coturnix\_japonica", "Tarsier - carlito\_syrichta", "Great spotted kiwi - apteryx\_haastii", "Pig-tailed macaque - macaca\_nemestrina", "Tuatara - sphenodon\_punctatus", "Pink-footed goose - anser\_brachyrhynchus", "Climbing perch - anabas\_testudineus", "Spotted gar - lepisosteus\_oculatus", "Golden snub-nosed monkey - rhinopithecus\_roxellana", "Daurian ground squirrel - spermophilus\_dauricus", "Amazon molly - poecilia\_formosa", "Turbot - scophthalmus\_maximus", "Algerian mouse - mus\_spretus", "Lamprey - petromyzon\_marinus", "Xenopus - xenopus\_tropicalis", "Agassiz's desert tortoise - gopherus\_agassizii", "American bison - bison\_bison\_bison", "Mouse 129S1/SvImJ - mus\_musculus\_129s1svimj", "Channel catfish - ictalurus\_punctatus", "Degu - octodon\_degus", "Angola colobus - colobus\_angolensis\_palliatus", "Golden-collared manakin - manacus\_vitellinus", "Eastern happy - astatotilapia\_calliptera", "Greater bamboo lemur - prolemur\_simus", "Mouse WSB/EiJ - mus\_musculus\_wsbeij", "Armadillo - dasypus\_novemcinctus", "Mangrove rivulus - kryptolebias\_marmoratus", "Mouse DBA/2J - mus\_musculus\_dba2j", "Arctic ground squirrel - urocitellus\_parryii", "Gorilla - gorilla\_gorilla", "Mouse Lemur - microcebus\_murinus", "Drill - mandrillus\_leucophaeus", "Central bearded dragon - pogona\_vitticeps", "American mink - neovison\_vison", "Great Tit - parus\_major", "Macaque - macaca\_mulatta", "Platypus - ornithorhynchus\_anatinus", "Japanese medaka HNI - oryzias\_latipes\_hni", "Hagfish - eptatretus\_burgeri", "Dingo - canis\_lupus\_dingo", "Zebrafish - danio\_rerio", "Mouse NOD/ShiLtJ - mus\_musculus\_nodshiltj", "Bicolor damselfish - stegastes\_partitus", "Long-tailed chinchilla - chinchilla\_lanigera", "Mouse C57BL/6NJ - mus\_musculus\_c57bl6nj", "Mexican tetra - astyanax\_mexicanus", "Squirrel - ictidomys\_tridecemlineatus", "Alpaca - vicugna\_pacos", "Australian saltwater crocodile - crocodylus\_porosus", "White-throated sparrow - zonotrichia\_albicollis", "Orange clownfish - amphiprion\_percula", "Tiger - panthera\_tigris\_altaica", "Turkey - meleagris\_gallopavo", "Ugandan red Colobus - piliocolobus\_tephrosceles", "Alpine marmot - marmota\_marmota\_marmota", "Common canary - serinus\_canaria", "Okarito brown kiwi - apteryx\_rowi", "Argentine black and white tegu - salvator\_merianae", "Sloth - choloepus\_hoffmanni", "Ryukyu mouse - mus\_caroli", "Shrew - sorex\_araneus", "Zebra Finch - taeniopygia\_guttata", "Gelada - theropithecus\_gelada", "Tiger tail seahorse - hippocampus\_comes", "Brazilian guinea pig - cavia\_aperea", "Periophthalmus magnuspinnatus - periophthalmus\_magnuspinnatus", "Ma's night monkey - aotus\_nancymaae", "Microbat - myotis\_lucifugus", "Pig - sus\_scrofa", "Coquerel's sifaka - propithecus\_coquereli", "Drosophila melanogaster - drosophila\_melanogaster", "Makobe Island cichlid - pundamilia\_nyererei", "Lesser hedgehog tenrec - echinops\_telfairi", "Dark-eyed junco - junco\_hyemalis", "Red fox - vulpes\_vulpes", "Chimpanzee - pan\_troglodytes", "Chinese hamster CriGri - cricetulus\_griseus\_crigri", "Greater amberjack - seriola\_dumerili", "Hedgehog - erinaceus\_europaeus", "Elephant - loxodonta\_africana", "Lyretail cichlid - neolamprologus\_brichardi", "Chinese softshell turtle - pelodiscus\_sinensis", "Prairie vole - microtus\_ochrogaster", "Ocean sunfish - mola\_mola", "Polar bear - ursus\_maritimus", "Emu - dromaius\_novaehollandiae", "Rabbit - oryctolagus\_cuniculus", "Monterrey platyfish - xiphophorus\_couchianus", "Sheepshead minnow - cyprinodon\_variegatus", "C.intestinalis - ciona\_intestinalis", "Red-bellied piranha - pygocentrus\_nattereri", "Northern pike - esox\_lucius", "Pika - ochotona\_princeps", "Ferret - mustela\_putorius\_furo", "C.savignyi - ciona\_savignyi", "Mongolian gerbil - meriones\_unguiculatus", "Paramormyrops kingsleyae - paramormyrops\_kingsleyae", "Lesser Egyptian jerboa - jaculus\_jaculus", "Kangaroo rat - dipodomys\_ordii", "Sooty mangabey - cercocebus\_atys", "Tilapia - oreochromis\_niloticus", "Orangutan - pongo\_abelii", "Painted turtle - chrysemys\_picta\_bellii", "Zebra mbuna - maylandia\_zebra", "Horse - equus\_caballus", "Golden Hamster - mesocricetus\_auratus", "Megabat - pteropus\_vampyrus", "Yellowtail amberjack - seriola\_lalandi\_dorsalis", "Blue tit - cyanistes\_caeruleus", "Mouse PWK/PhJ - mus\_musculus\_pwkphj", "Cod - gadus\_morhua", "Burton's mouthbrooder - haplochromis\_burtoni", "Saccharomyces cerevisiae - saccharomyces\_cerevisiae", "Tongue sole - cynoglossus\_semilaevis", "Dog - canis\_familiaris", "Swamp eel - monopterus\_albus", "Panda - ailuropoda\_melanoleuca", "American beaver - castor\_canadensis", "Budgerigar - melopsittacus\_undulatus", "Northern American deer mouse - peromyscus\_maniculatus\_bairdii", "Flycatcher - ficedula\_albicollis", "Wild yak - bos\_mutus", "Mouse BALB/cJ - mus\_musculus\_balbcj", "Mouse CAST/EiJ - mus\_musculus\_casteij", "Rat - rattus\_norvegicus", "Bushbaby - otolemur\_garnettii", "Naked mole-rat male - heterocephalus\_glaber\_male", "Caenorhabditis elegans - caenorhabditis\_elegans", "Guppy - poecilia\_reticulata", "Japanese medaka HSOK - oryzias\_latipes\_hsok", "Tetraodon - tetraodon\_nigroviridis", "Chilean tinamou - nothoprocta\_perdicaria", "Tree Shrew - tupaia\_belangeri", "Mouse C3H/HeJ - mus\_musculus\_c3hhej", "Shortfin molly - poecilia\_mexicana", "Japanese medaka HdrR - oryzias\_latipes", "Hyrax - procavia\_capensis", "Mouse AKR/J - mus\_musculus\_akrj"]

/listSpecies?limit=10

Browser’s url: <http://127.0.0.1:8000/listSpecies?limit=10&json=1>

json code form the returned result:

"Flycatcher - ficedula\_albicollis"1"American beaver - castor\_canadensis"2"C.intestinalis - ciona\_intestinalis"3"Central bearded dragon - pogona\_vitticeps"4"Golden-collared manakin - manacus\_vitellinus"5"Steppe mouse - mus\_spicilegus"6"White-throated sparrow - zonotrichia\_albicollis"7"Kangaroo rat - dipodomys\_ordii"8"Gibbon - nomascus\_leucogenys"9"Mouse FVB/NJ - mus\_musculus\_fvbnj"

/karyotype

Browser’s url: <http://127.0.0.1:8000/karyotype?specie=sheep&json=1>

json code form the returned result:

["1", "2", "3", "4", "5", "6", "7", "8", "9", "10", "11", "12", "13", "14", "15", "16", "17", "18", "19", "20", "21", "22", "23", "24", "25", "26", "X", "MT"]

/chromosomeLength

Browser’s url: <http://127.0.0.1:8000/karyotype?specie=sheep&json=1>

json code form the returned result:

"160039680"

/geneSeq

Browser’s url: <http://127.0.0.1:8000/geneSeq?gene=FRAT2&json=1>

json code form the returned result:

"AGGCGCGTGGCTCGAGTGCCTGGCGGGCTCCGGCTTCCGCGTCCGCCCCTGCTCCGGCTTCGCCCGCAGCTCCGCGCCCGCGGGCAACCAAGCCCCCAGCGAAGCCCGCACAGCTCCGGGTGCCAGGACGGGGGGCCATGCCGTGCCGGAGGGAGGAGGAAGAGGAAGCCGGCGAGGAGGCGGAGGGGGAGGAAGAGGAGGACGACAGCTTCCTCCTGCTGCAGCAGTCGGTGACGCTGGGCAGCTCGGGCGAGGTGGACCGGCTGGTGGCCCAGATCGGCGAGACGCTGCAGCTGGACGCGGCGCAGGACAGCCCGGCCTCGCCGTGCGCGCCCCCGGGGGTGCCGCTGCGGGCCCCGGGGCCCCTGGCTGCGGCGGTGCCGGCGGACAAGGCCCGGCCCCCGGCGGTGCCGCTGCTGCTGCCGCCCGCTTCGGCTGAGACGGTGGGCCCGGCGCCCTCTGGGGCCCTGCGCTGCGCCCTAGGGGACCGCGGCCGCGTGCGCGGACGCGCTGCGCCCTACTGCGTGGCGGAGGTCGCCGCAGGCCCCAGCGCGCTGCCGGGGCCGTGCCGGCGAGGATGGCTCAGGGACGCGGTCACCTCCCGCCGCTTGCAGCAGCGCCGATGGACCCAAGCCGGGGCACGCGCCGGCGACGACGACCCGCATCGGCTCCTCCAGCAGCTCGTGCTCTCGGGAAACCTCATCAAGGAAGCCGTGCGGAGACTCCAACGAGCCGTCGCCGCGGTTGCAGCCACGGGCCCCGCAAGCGCCCCTGGGCCCGGGGGAGGCCGCAGCGGACCTGACCGCATTGCCCTGCAGCCCTCAGGCTCCTTGCTCTGACGCAGGCCTCCTGGAGGAGGAAGTGGAGGCCGCTGCGTAGACCCAACAGCGTCCAGTTCCTACTAACTCTGAGCTGAAGCCGACGTCGCCAGCCTGGGAGCGACCACTTTGGCTGCGGGGAGGCGCGTGGGGAGAGATCTCAACCAGAGAAGTTACCAGCCGCGGCGAGGCCGTCGGAGAAAACTTAAGCGTGGAGAAATGTATGCGCCAGGGTGCTTCCGTGGGGCATGAGAATTTCCCGGGCCATCCAAGCCCAAGGACCTGGGATAAACTGGGAGAACTATGGCAGCTACTTGCATCGACTTGTACCTCACTTAGCCCTTGGGGGCGTCGTGAGCTTGGATTGTTTAAGGAGGGCTCAGGGGTAGGAATCGCGATGGCTTTATAACAATACTTGAAAACTAACGACACGCATACATTTTCTTATTTTCTGGTGGAGGAGCTTAGTAAGTGGTGCTACAATTGCTGTGCAAAGAAATTCCAGAGGGGAGAAGAATGTAAAAGTTTGGTGGTGGGTGGCTTGGCATTGCCCCTTTTTCCCACCGATTCGGTGGCTGGTGAAGGTGGGAGATGTGAACTCCAATTAAGGGACTGGAGAGAGGTGAAGAATTTTGCAGGTGGGAGATTTGGATTTGAATGTGGACTTGTAAATGACTTGACCTTGCCATCTGTGTTCAAGGTCACGGTTTGCTGTGGGGTTCCTGGGAGAGCTTACTCACCCCGGAGTCTTTTCTTTCTCTTGCTCCAAGAAGAGCCCTGTTGGTGCTTTACCACCGCTTGGAGTCTCCCGAGGACACAAACAGGCAGAGAGGGACGTGTAGGGAGAGTTCTTTCCTGTTTTCTGTGCTTTCCTTTTTACAGGACTCCCGGAAGGCCACTCATGGCCATGCCAGGAGCTTTCTCAGAAACAGTCATAAACGATCTCTTGAGTCTCTTTCTTGTCCTCCCAGCTGAGCTTTCTTATTCCACCCTTTCTGGTGTCTATAGGAATGCATGAGAGACCCTGGACGTTTTTCTGCTCTCTTCTGGCCCTCCATGGAGTCATGGGCCTCGGCCTCGGCGGCTCCTCACCCTCACAATTTATTTCCTCCTCCCGTGCCAGCCCTTCTTTTGTGTCTGAAACCGGTTTTAAAATGTGACTCTCCCAGAGAAGAAGCCGCTGGCTGTATGAAACTTGACGGCGCTTTTGTAAGGTGCCACCCCCAAACTTTAAGGTAGCTAAACCAATTTTTAAAAGATTCAATGGCTTGTTCATCCTCCAGATGTAGCTATTGATGTACACTTCGCAACGGAGTGTCTGAAATTGTGGTGGTCCTGATTTATAGGATTTCATAATTAAAATGTCTGCTGAATAAATTTGGCTTTTGTTTTGGA"

/geneInfo

Browser’s url: <http://127.0.0.1:8000/geneSeq?gene=FRAT2&json=1>

json code form the returned result:

"Starting point: 15778170"1"Ending point: 15860507"2"Length: 82337"3"Chromosme: GRCh38"

/geneCalc

Browser’s url: <http://127.0.0.1:8000/geneCal?gene=OSCAR&json=1>

json code form the returned result:

"Total length: 8025"1"Percentage A: 24.8%"2"Percentage C: 25.7%"3"Percentage G: 27.4%"4"Percentage T: 22.1%"

/geneList

Browser’s url: <http://127.0.0.1:8000/geneList?chromo=3&start=0&end=500000&json=1>

json code form the returned result:

"LINC01986 Start: 23757 End: 24501"1"AC066595.1 Start: 53348 End: 54346"2"CHL1-AS2 Start: 195758 End: 197341"3"CHL1 Start: 196763 End: 409417"4"RNU6-1194P Start: 282689 End: 282792"5"RPS8P6 Start: 308714 End: 309322"6"CHL1-AS1 Start: 363370 End: 385795"