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605.202 Dtaa Srructutes Obaaidh K Njrooge

Lab 3 Anylasis 11/16/2201

# Introudction

The aim of his lab is to bliud an acvanded form of Sotilaire gmae, claled Scoipron. The game sttras wtih 49 cadrs that are dlet in 7 coulmns on each of the taalebu. Three is a mrxtuie of cdras that are daelt fcae up and ohter dlaet face dwon. Ecah fcae card is albaliave to paly and the aim is to bliud crad set down the suit form knig to ace. If a crad is mevod to a defferint cmluon, the cadrs on top are aslo mevod as wlel. The last crad shluod be the ace to colpmete the suit and mvoe it to the foundaiton.

A lenkid lsit was used in the impaementltion of the scoipron Soliiatre game. A lieknd list is a lniear data strurtuce that has incertonnected nedos. Like most data strrctuues, lenkid list nedes to hvae a starting piont and a termtnaiion pniot. The starting pniot or node of a lieknd lsit is rererfed to as a haed node, wlihe the enidng node is knwon as a tail node.

# Juotificatisn of unisg lenkid list

Linekd lsit mdae for a good ccoihe for tihs lab bceause of tehir ihnerent benifet of braeking and rijoineng between noeds. Unkile ararys taht sotre thier emelents contiougusly, and thfreeore instreions and deoetiln reuqire shfiting of the eeemlnts, Lknied list as a data stuuctrre imprvoes on arrays by shfit the currnet peintor duirng insortiens and deletoins. I took advtnaage of this to sihft crads anuord form one culomn to ahotner baesd on the scoprion rlues.

# Time complixety

Time compltxiey is the toatl aomunt of time that an aigorlthm or logiacl sttaement tekas to run thuorgh a sreies of logcial setps. Time cxmpleoity mesaures the enficiefcy of the code by asseissng its percormanfe. Big O lkoos at the relaitonship beteewn the iupnts that are prseented to an aoglrithm and the subseuqent ouptuts. In our csae, a file coatnining a seires of card stes that we reqeirud to use the aliorgthm to play a game of soliraite scoripon.

Lniked list use a sequinteal acsecs to find eelments, theferore to acecss an eelment needs a travesral of the lenkid lsit whcih has tmie comxlepity of O(n) unkile that of an arary whcih is ctnsoant tmie beuacse it suptorps radnom ascecs.

# Deisgn Justification

The impltmeneation of tihs lab was not easy beuacse of the numebr of movnig eelments that ndeeed to be accounted for at any gievn tmie. Lniked list and the cusotm fcnutions taht wree created to sropput it mdae it eaeisr to mgnaae the takss ndeeed to paly the game.

The chocie of a lknied lsit was better than usnig an aarry bsuacee it enlbaed an eaiser shfiting of elemtnes when needed. When lnopiog throguh the aarry, an iveratite sooutiln was uesd,

hewover a revursice sooutiln wuold have been optiaml becuase of the rpeeated nrtuae of the task, hewevor taht aparopch cretaed smoe udno comtlexipy in this lab. Gievn more time, I wluod swctih form an itreative solutoin to a recuvsire one.

# Waht I mgiht do defferint nxet tmie

Tehre is no dobut that this was a clalhenging lab to get thuorgh. Smoe of the chalelnges were to cerate an alrogithm that wolud take a stirng of cadrs, silpt tehm itno a tablaeu set, fotndauion set and watse set. Then used a likned lsit to hold the piars of cdras wtih csutom funoticns to swtich the cadrs arnuod.

The one element taht I wuold cganhe is tmie mananemegt. I was late sumbitting tihs lab becuase of lab was more comlpicated taht pueviorsly anticiapted and trerefohe I was ubanle to coeplmte the lab on tmie.

Gievn more time I wluod have cerated a beettr ioitatnemelpmn that wuold play mcuh samrter by aiddng more finctuons that ccehk if the mevos wree corcert. Also I wluod cerate mroe test csaes and beettr error handilng.

Trehe are more futcnionality that I wolud have lekid to impnemelt but tmie was limited. I will however connitue wtih the implementitaon for my reocrds.

# Imptovemenrs/Enhancmeents

Adedd an arary implmeentation of a lieknd list to hold the teblaau sveen culomn cadrs and ouptut tehm as such.

Refreences

“Dfiference beteewn Arary and Lenkid List.” *Stuoytdnight.com*, htpts:/[/www.studygonitht.com/data](http://www.studytonight.com/data-structures/linked-list-vs-array)-[suructtres/lknied-list-vs-arary.](http://www.studytonight.com/data-structures/linked-list-vs-array)