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The List

by nickapic / Class3E

Tags: pwn

Rating:

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<ti><ti><ti>NahamCon2021-Writeups/pwn/theList at master · Class-3E/NahamCon2021-Writeups · GitHub</ti>3E/NahamCon2021-Writeups development by creating an account on GitHub."> | Sink rel="search" type="application/opensearchdescription+xml" href="/opensearch.xml" title="GitHub"> | Sink rel="fluid-icon" href="https://github.com/fluidicon.png" title="GitHub"> <meta property="fb:app_id" content="1401488693436528"> <meta name="apple-itunes-app" content="app-id=1477376905" /> <meta name="twitter:image:src"</td>

content="https://opengraph.githubassets.com/d527e8c88958e98acf6e1e016cca9cd9d232580075d39eb3f013cf13134917cf/Class-3E/NahamCon2021-Writeups" /><meta name="twitter:site" content="@github" /><meta name="twitter:card" content="summary_large_image" /><meta name="twitter:title" content="NahamCon2021-Writeups/pwn/theList at master · Class-3E/NahamCon2021-Writeups" /><meta name="twitter:description" content="Contribute to Class-3E/NahamCon2021-Writeups development by creating an account on GitHub." /> <meta property="og:image" content="https://opengraph.githubassets.com/d527e8c88958e98acf6e1e016cca9cd9d232580075d39eb3f013cf13134917cf/Class-3E/NahamCon2021-Writeups" /><meta property="og:image:alt" content="Contribute to Class-3E/NahamCon2021-Writeups development by creating an account on GitHub." /><meta property="og:image:alt" content="Contribute to Class-3E/NahamCon2021-Writeups development by creating an account on GitHub." /><meta property="og:image:alt" content="Github" /><meta property="og:itle" content="Bithub.com/Class-3E/NahamCon2021-Writeups" /><meta property="og:itle" content="Bithub.com/Class-3E/NahamCon2021-Writeups" /><meta property="og:description" content="Contribute to Class-3E/NahamCon2021-Writeups development by creating an account on GitHub." />

k rel="assets" href="https://github.githubassets.com/">

<meta name="request-id" content="BB03:E6C4:129C6C2:139E61C:6183077C" data-pjax-transient="true"/><meta name="html-safe-nonce" content="6bf560f31a5c95aac4eb57cdf0f18224939f336ae35a6c8a41756896f1c99942" data-pjax-transient="true"/><meta name="visitor-payload" content="eyJyZWZlcn.Jlcil6lilsInJlcXVlc3RfaWQiOiJCQjAzOkU2QzQ6MTI5QzZDMjoxMzIFNjFDOjYxODMwNzdDIiwidmlzaXRvcl9pZCl6ljg0MzUzMzQ4NDA2MzQ3NzEzMjQiLCJyZWdpb25f2 data-pjax-transient="true"/><meta name="visitor-hmac" content="a37077a8afb2ae393a7f911e80d6256ad63ab6f9192fbfb7170bc5f272890335" data-pjax-transient="true"/>

```
<meta name="hovercard-subject-tag" content="repository:347462794" data-pjax-transient>
```

<meta name="github-keyboard-shortcuts" content="repository,source-code" data-pjax-transient="true" />

<meta name="selected-link" value="repo_source" data-pjax-transient>

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<meta name="octolytics-url" content="https://collector.githubapp.com/github/collect" />

<meta name="analytics-location" content="/<user-name>/<repo-name>/files/disambiguate" data-pjax-transient="true" />

```
<meta name="hostname" content="github.com">
<meta name="user-login" content="">
<meta name="expected-hostname" content="github.com">
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<meta name="enabled-features" content="MARKETPLACE_PENDING_INSTALLATIONS,FILE_UPLOAD_CURSOR_POSITION">
```

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<meta name="go-import" content="github.com/Class-3E/NahamCon2021-Writeups git https://github.com/Class-3E/NahamCon2021-Writeups.git">

<meta name="octolytics-dimension-user_id" content="77891481" /><meta name="octolytics-dimension-user_login" content="Class-3E" /><meta name="octolytics-dimension-repository_id" content="347462794" /><meta name="octolytics-dimension-repository_nwo" content="Class-3E/NahamCon2021-Writeups" /><meta name="octolytics-dimension-repository_public" content="true" /><meta name="octolytics-dimension-repository_is_fork" content="false" /><meta name="octolytics-dimension-repository_network_root_id" content="347462794" /><meta name="octolytics-dimension-repository_network_root_nwo" content="Class-3E/NahamCon2021-Writeups" />

```
<link rel="canonical" href="https://github.com/Class-3E/NahamCon2021-Writeups/tree/master/pwn/theList" data-pjax-transient>
```

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<meta name="browser-optimizely-client-errors-url" content="https://api.github.com/_private/browser/optimizely_client/errors">

<link rel="mask-icon" href="https://github.githubassets.com/pinned-octocat.svg" color="#000000"> <link rel="alternate icon" class="js-site-favicon" type="image/png"
href="https://github.githubassets.com/favicons/favicon.png"> <link rel="icon" class="js-site-favicon" type="image/svg+xml" href="https://github.githubassets.com/favicons/favicon.svg">

<meta name="theme-color" content="#1e2327"> <meta name="color-scheme" content="light dark" />

k rel="manifest" href="/manifest.json" crossOrigin="use-credentials">

/hoods

<body class="logged-out env-production page-responsive" style="word-wrap: break-word;">

```
<div class="position-relative js-header-wrapper ">
  <a href="#start-of-content" class="px-2 py-4 color-bg-info-inverse color-text-white show-on-focus js-skip-to-content">Skip to content</a>
  <span data-view-component="true" class="progress-pjax-loader js-pjax-loader-bar Progress position-fixed width-full">
  <span style="width: 0%;" data-view-component="true" class="Progress-item progress-pjax-loader-bar color-bg-info-inverse"></span>
```


<header class="Header-old header-logged-out js-details-container Details position-relative f4 py-2" role="banner"> <div class="container-xl d-lg-flex flex-items-center p-responsive"> <div class="d-flex flex-justify-between flex-items-center"> <svg height="32" aria-hidden="true" viewBox="0 0 16 16" version="1.1" width="32" data-view-component="true" class="oction oction-mark-github color-text-white"> <path fill-rule="evenodd" d="M8 0C3.58 0 0 3.58 0 8c0 3.54 2.29 6.53 5.47 7.59.4.07.55-.17.55-.38 0-.19-.01-.82-.01-.149-2.01.37-2.53-.49-2.69-.94-.09-.23-.48-.94-.82-1.13-.28-.15-.68-.52-.01-.53.63-.01 1.08.58 1.23.82.72 1.21 1.87.87 2.33.66.07-.52.28-.87.51-1.07-1.78-.2-3.64-.89-3.64-3.95 0-.87.31-1.59.82-2.15-.08-.2-36-1.02.08-2.12 0 0.67-.21 2.2.82.64-.18 1.32-.27 2-.27.68 0 1.36.09 2 .27 1.53-1.04 2.2-.82 2.2-.82 44 1.1.16 1.92.08 2.12.51.56.82 1.27.82 2.15 0 3.07-1.87 3.75-3.65 3.95.29.25.54.73.54 1.48 0 1.07-.01 1.93-.01 2.2 0 .21.15.46.55.38A8.013 8.013 0 0016 8c0-4.42-3.58-8-8-8z">

```
<div class="d-lg-none css-truncate css-truncate-target width-fit p-2">
                     </div>
               <div class="d-flex flex-items-center">
                                   <a href="/signup?ref_cta=Sign+up&amp;ref_loc=header+logged+out&amp;ref_page=%2F%3Cuser-name%3E%2F%3Crepo-name%3E%2Ffiles%2Fdisambiguate&amp;sourc</pre>
e=header-repo'
                                          class="d-inline-block d-lg-none f5 color-text-white no-underline border color-border-default rounded-2 px-2 py-1 mr-3 mr-sm-5"
                                          data-hydro-click="{"event_type":"suthentication.click","payload":{"location_in_page":"site header&
quot; , \& quot; repository\_id \& quot; : null, \& quot; auth\_type \& quot; SIGN\_UP \& quot; , \& quot; originating\_url \& quot; : \& quot; https://github.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Class-3E/NahamCon2021-Wighthup.com/Cla
riteups/tree/master/pwn/theList\", \" user\_id\":null\}\}" \ data-hydro-click-hmac="b4f25e531004b53a8f1eac4f8e3929ab9bc297daf00b7b591aafee4220de2bea" \ data-hydro-click-hmac="b4f25e531004b53a8f1eac4f8e394b6afee4260b6afee4260b6afee4260b6afee4260b6afee4260b6afee4260b6afee4260b6afee4260b6afee4260b6afee4260b6
                                          Sign up
                                    </a>
                     <button aria-label="Toggle navigation" aria-expanded="false" type="button" data-view-component="true" class="js-details-target btn-link d-lg-none mt-</pre>
1">
                             <swg aria-hidden="true" height="24" viewBox="0 0 16 16" version="1.1" width="24" data-view-component="true" class="octicon octicon-three-bars color</pre>
-text-white">
5 0 011 7.75zM1.75 12a.75.75 0 100 1.5h12.5a.75.75 0 100-1.5H1.75z"></path>
```

</svg>

</button> </div> </div>

</svg>

</button> </div>

```
<path d="M1,116.2,6L13,1"></path>
                    </svg>
                  </summary>
                  <div class="dropdown-menu flex-auto rounded px-0 mt-0 pb-4 p-lg-4 position-relative position-lg-absolute left-0 left-lg-n4">
                    <a href="/features" class="py-2 lh-condensed-ultra d-block Link--primary no-underline h5 Bump-link--hover" data-ga-click="(Logged out) Head
er, go to Features">Features <span class="Bump-link-symbol float-right text-normal color-fg-muted pr-3">&rarr;</span></a>
                    class="list-style-none f5 pb-3">
                            class="edge-item-fix"><a href="/mobile" class="py-2 lh-condensed-ultra d-block Link--secondary no-underline f5 Bump-link--hover">
\label{local_mobile} \textbf{Mobile } < \textbf{span } \textbf{class="Bump-link-symbol float-right text-normal color-fg-muted pr-3"} \\ & \textbf{class="Color-fg-muted pr-3
                            <1i class="edge-item-fix"><a href="/features/actions" class="py-2 lh-condensed-ultra d-block Link--secondary no-underline f5 Bump-lin</pre>
k--hover">Actions < span class="Bump-link-symbol float-right text-normal color-fg-muted pr-3">&rarr;</span></a>
                            class="edge-item-fix"><a href="/features/codespaces" class="py-2 lh-condensed-ultra d-block Link--secondary no-underline f5 Bump-</pre>
link--hover">Codespaces <span class="Bump-link-symbol float-right text-normal color-fg-muted pr-3">&rarr;</span>
                            class="edge-item-fix"><a href="/features/packages" class="py-2 lh-condensed-ultra d-block Link--secondary no-underline f5 Bump-li</pre>
nk--hover">Packages <span class="Bump-link-symbol float-right text-normal color-fg-muted pr-3">&rarr;</span></a>
                            class="edge-item-fix"><a href="/features/security" class="py-2 lh-condensed-ultra d-block Link--secondary no-underline f5 Bump-li</pre>
nk--hover">Security <span class="Bump-link-symbol float-right text-normal color-fg-muted pr-3">&rarr;</span></a>>
                             class="edge-item-fix"><a href="/features/code-review/" class="py-2 lh-condensed-ultra d-block Link--secondary no-underline f5 Bum</pre>
p-link--hover">Code review <span class="Bump-link-symbol float-right text-normal color-fg-muted pr-3">&rarr;</span></a>:
                            class="edge-item-fix"><a href="/features/issues/" class="py-2 lh-condensed-ultra d-block Link--secondary no-underline f5 Bump-lin</pre>
k--hover">Issues <span class="Bump-link-symbol float-right text-normal color-fg-muted pr-3">&rarr;</span></a>
                            class="edge-item-fix"><a href="/features/integrations" class="py-2 lh-condensed-ultra d-block Link--secondary no-underline f5 Bum</pre>
p-link--hover">Integrations < span class="Bump-link-symbol float-right text-normal color-fg-muted pr-3">& rarr; </span></a> 
                    class="list-style-none mb-0 border-lg-top pt-lg-3">
                      class="edge-item-fix"><a href="/sponsors" class="py-2 lh-condensed-ultra d-block no-underline Link--primary no-underline h5 Bump-link</pre>
--hover" data-ga-click="(Logged out) Header, go to Sponsors">GitHub Sponsors <span class="Bump-link-symbol float-right text-normal color-fg-muted pr-3">&ra
rr;</span></a>
                       class="edge-item-fix"><a href="/customer-stories" class="py-2 lh-condensed-ultra d-block no-underline Link--primary no-underline h5 B</pre>
ump-link--hover" data-ga-click="(Logged out) Header, go to Customer stories">Customer stories<span class="Bump-link-symbol float-right text-normal color-fg
-muted pr-3">→</span></a>
                    </div>
               </details>
             class="border-bottom border-lg-bottom-0 mr-0 mr-lg-3">
               <a href="/team" class="HeaderMenu-link no-underline py-3 d-block d-lg-inline-block" data-ga-click="(Logged out) Header, go to Team">Team</a>
             <a href="/enterprise" class="HeaderMenu-link no-underline py-3 d-block d-lg-inline-block" data-ga-click="(Logged out) Header, go to Enterpris
e">Enterprise</a>
             <1i class="d-block d-lg-flex flex-lg-nowrap flex-lg-items-center border-bottom border-lg-bottom-0 mr-0 mr-lg-3 edge-item-fix position-relative fl</pre>
ex-wrap flex-justify-between d-flex flex-items-center ">
               <details class="HeaderMenu-details details-overlay details-reset width-full">
                  <summary class="HeaderMenu-summary HeaderMenu-link px-0 py-3 border-0 no-wrap d-block d-lg-inline-block">
                    Explore
                    <swg x="0px" y="0px" viewBox="0 0 14 8" xml:space="preserve" fill="none" class="icon-chevon-down-mktg position-absolute position-lg-relativ</pre>
                       <path d="M1,116.2,6L13,1"></path>
                    </svg>
                  </summary>
                  <div class="dropdown-menu flex-auto rounded px-0 pt-2 pb-0 mt-0 pb-4 p-lg-4 position-relative position-lg-absolute left-0 left-lg-n4">
                    class="list-style-none mb-3">
                       class="edge-item-fix"><a href="/explore" class="py-2 lh-condensed-ultra d-block Link--primary no-underline h5 Bump-link--hover" data-</pre>
ga-click="(Logged out) Header, go to Explore">Explore GitHub <span class="Bump-link-symbol float-right text-normal color-fg-muted pr-3">&rarr;</span></a>
li>
                    <h4 class="color-fg-muted text-normal text-mono f5 mb-2 border-lg-top pt-lg-3">Learn and contribute</h4>
                    class="list-style-none mb-3">
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-ga-click="(Logged out) Header, go to Topics">Topics <span class="Bump-link-symbol float-right text-normal color-fg-muted pr-3">&rarr;</span></a>
                         class="edge-item-fix"><a href="/collections" class="py-2 lh-condensed-ultra d-block Link--secondary no-underline f5 Bump-link--hove</pre>
r" data-ga-click="(Logged out) Header, go to Collections">Collections <span class="Bump-link-symbol float-right text-normal color-fg-muted pr-3">&rarr;</sp
an></a>
                       class="edge-item-fix"><a href="/trending" class="py-2 lh-condensed-ultra d-block Link--secondary no-underline f5 Bump-link--hover" da</pre>
ta-ga-click="(Logged out) Header, go to Trending">Trending <span class="Bump-link-symbol float-right text-normal color-fg-muted pr-3">&rarr;</span></a></li
                       class="edge-item-fix"><a href="https://lab.github.com/" class="py-2 lh-condensed-ultra d-block Link--secondary no-underline f5 Bump-1</pre>
ink--hover" data-ga-click="(Logged out) Header, go to Learning lab">Learning Lab <span class="Bump-link-symbol float-right text-normal color-fg-muted pr-
3">→</span></a>
                       class="edge-item-fix"><a href="https://opensource.guide" class="py-2 lh-condensed-ultra d-block Link--secondary no-underline f5 Bump-</pre>
link--hover" data-ga-click="(Logged out) Header, go to Open source guides">Open source guides <span class="Bump-link-symbol float-right text-normal color-f
g-muted pr-3">→</span></a>
                    </11/5
                    <h4 class="color-fg-muted text-normal text-mono f5 mb-2 border-lg-top pt-lg-3">Connect with others</h4>
                    class="edge-item-fix"><a href="https://github.com/readme" class="py-2 lh-condensed-ultra d-block Link--secondary no-underline f5 Bump</pre>
-link--hover">The ReadME Project <span class="Bump-link-symbol float-right text-normal color-fg-muted pr-3">&rarr;</span></a>
                       class="edge-item-fix"><a href="https://github.com/events" class="py-2 lh-condensed-ultra d-block Link--secondary no-underline f5 Bump</pre>
-link--hover" data-ga-click="(Logged out) Header, go to Events">Events <span class="Bump-link-symbol float-right text-normal color-fg-muted pr-3">&rarr;</s
```

```
<1i class="edge-item-fix"><a href="https://github.community" class="py-2 lh-condensed-ultra d-block Link--secondary no-underline f5 Bump-</pre>
link--hover" data-ga-click="(Logged out) Header, go to Community forum">Community forum <span class="Bump-link-symbol float-right text-normal color-fg-mute
d pr-3">→</span></a>
                 class="edge-item-fix"><a href="https://education.github.com" class="py-2 lh-condensed-ultra d-block Link--secondary no-underline f5 B</pre>
ump-link--hover" data-ga-click="(Logged out) Header, go to GitHub Education">GitHub Education <span class="Bump-link-symbol float-right text-normal color-f
g-muted pr-3">→</span></a>
                 class="edge-item-fix"><a href="https://stars.github.com" class="py-2 pb-0 lh-condensed-ultra d-block Link--secondary no-underline f5</pre>
Bump-link--hover" data-ga-click="(Logged out) Header, go to GitHub Stars Program">GitHub Stars program <span class="Bump-link-symbol float-right text-norma
1 color-fg-muted pr-3">→</span></a>
               </div>
           </details>
         class="border-bottom border-lg-bottom-0 mr-0 mr-lg-3">
           <a href="/marketplace" class="HeaderMenu-link no-underline py-3 d-block d-lg-inline-block" data-ga-click="(Logged out) Header, go to Marketplac
e">Marketplace</a>
         class="d-block d-lg-flex flex-lg-nowrap flex-lg-items-center border-bottom border-lg-bottom-0 mr-0 mr-lg-3 edge-item-fix position-relative fl
ex-wrap flex-justify-between d-flex flex-items-center ">
           <details class="HeaderMenu-details details-overlay details-reset width-full">
             <summary class="HeaderMenu-summary HeaderMenu-link px-0 py-3 border-0 no-wrap d-block d-lg-inline-block">
               Pricing
               <svg x="0px" y="0px" viewBox="0 0 14 8" xml:space="preserve" fill="none" class="icon-chevon-down-mktg position-absolute position-lg-relativ</pre>
                  <path d="M1,116.2,6L13,1"></path>
               </svg>
             </summary
             <div class="dropdown-menu flex-auto rounded px-0 pt-2 pb-4 mt-0 p-lg-4 position-relative position-lg-absolute left-0 left-lg-n4">
               <a href="/pricing" class="pb-2 lh-condensed-ultra d-block Link--primary no-underline h5 Bump-link--hover" data-ga-click="(Logged out) Heade
r, go to Pricing">Plans <span class="Bump-link-symbol float-right text-normal color-fg-muted pr-3">&rarr;</span></a>
               class="list-style-none mb-3">
                 class="edge-item-fix"><a href="/pricing#feature-comparison" class="py-2 lh-condensed-ultra d-block Link--secondary no-underline f5 Bu</pre>
mp-link--hover" data-ga-click="(Logged out) Header, go to Compare plans">Compare plans <span class="Bump-link-symbol float-right text-normal color-fg-muted"
pr-3">→</span></a>
                 class="edge-item-fix"><a href="https://github.com/enterprise/contact" class="py-2 lh-condensed-ultra d-block Link--secondary no-under</pre>
line f5 Bump-link--hover" data-ga-click="(Logged out) Header, go to Contact Sales">Contact Sales < span class="Bump-link-symbol float-right text-normal colo
r-fg-muted pr-3">→</span></a>
               class="list-style-none mb-0 border-lg-top pt-lg-3">
                 class="edge-item-fix"><a href="https://education.github.com" class="py-2 pb-0 lh-condensed-ultra d-block no-underline Link--primary n</pre>
o-underline h5 Bump-link--hover" data-ga-click="(Logged out) Header, go to Education">Education < span class="Bump-link-symbol float-right text-normal colo
r-fg-muted pr-3">→</span></a>
               </div>
           </details>
         </nav>
  <div class="d-lg-flex flex-items-center px-3 px-lg-0 text-center text-lg-left">
     <div class="d-lg-flex min-width-0 mb-3 mb-lg-0">
```

<div class="header-search flex-auto js-site-search position-relative flex-self-stretch flex-md-self-auto mb-3 mb-md-0 mr-0 mr-md-3 scoped-search site-scoped-search js-jump-to"</p>

<div class="position-relative"> <!-- "` --> <!-- </textarea></xmp> --> </option></form> form class="js-site-search-form" role="search" aria-label="Site" data-scope-type="Repository" data-scope-id="347462794" data-scoped-search-url="/Class-3E/NahamCon2021-Writeups/search" data-owner-scoped-search-url="/orgs/Class-3E/search" data-unscoped-search-url="/search" action="/Class-3E/NahamCon2021-Writeups/search" accept-charset="UTF-8" method="get"> <label class="form-control input-sm header-search-wrapper p-0 js-chromeless-input-container header-search-wrapper-jump-to position-relative d-flex flex-justify-between flex-items-center"> <input type="text" class="form-control input-sm header-search-wrapper-jump-to-field js-site-search-focus js-site-search-field is-clearable" data-hotkey=s,/ name="q" data-test-selector="nav-search-input" placeholder="Search" data-unscoped-placeholder="Search GitHub" data-scoped-placeholder="Search" autocapitalize="off" role="combobox" aria-haspopup="listbox" aria-expanded="false" aria-autocomplete="list" aria-controls="jump-to-results" aria-label="Search" data-jump-to-suggestions-path="/_graphql/GetSuggestedNavigationDestinations" spellcheck="false" autocomplete="off" > <input type="hidden" data-csrf="true" class="js-data-jump-to-suggestions-path-csrf"</p>

value = "6ACGdICk3wi/JA3gARcKuE4WaNUp0q5eCjgxKessDGb1UBk4n/m+9dqipQrdAjXActcP+aUi6XJBU7zv5VKraQ==" /> <input type="hidden" class="js-site-search-type-field" name="type" > <svg xmlns="http://www.w3.org/2000/svg" width="22" height="20" aria-hidden="true" class="mr-1 header-search-key-slash"><path fill="none" stroke="#979A9C" opacity=".4" d="M3.5.5h12c1.7 0 3 1.3 3 3v13c0 1.7-1.3 3-3 3h-12c-1.7 0-3-1.3-3-3v-13c0-1.7 1.3-3 3-3z"></path><path fill="#979A9C" d="M11.8 6L8 15.1h-.9L10.8 6h1z"></path></svg>

```
<div class="Box position-absolute overflow-hidden d-none jump-to-suggestions js-jump-to-suggestions-container">
```

```
<img class="avatar mr-2 flex-shrink-0 js-jump-to-suggestion-avatar d-none" alt="" aria-label="Team" src="" width="28" height="28">
<div class="jump-to-suggestion-name js-jump-to-suggestion-name flex-auto overflow-hidden text-left no-wrap css-truncate css-truncate-target">
</div>
<div class="border rounded-1 flex-shrink-0 color-bg-tertiary px-1 color-text-tertiary ml-1 f6 d-none js-jump-to-badge-search">
  <span class="js-jump-to-badge-search-text-default d-none" aria-label="in this repository">
   In this repository
  </span>
  <span class="js-jump-to-badge-search-text-global d-none" aria-label="in all of GitHub">
   All GitHub
  </span>
 <span aria-hidden="true" class="d-inline-block ml-1 v-align-middle">↵</span>
</div>
<div aria-hidden="true" class="border rounded-1 flex-shrink-0 color-bg-tertiary px-1 color-text-tertiary ml-1 f6 d-none d-on-nav-focus js-jump-to-badge-jum</pre>
p">
 Jump to
  <span class="d-inline-block ml-1 v-align-middle">⟨</span>
</div>
```


uid="jump-to-results" role="listbox" class="p-0 m-0 js-navigation-container jump-to-suggestions-results-container js-jump-to-suggestions-results-container">

cli class="d-flex flex-justify-start flex-items-center p-0 f5 navigation-item js-navigation-item js-jump-to-scoped-search d-none" role="option"> <div class="jump-to-octicon js-jump-to-octicon flex-shrink-0" mr-2 text-center d-none"> <svg title="Repository" aria-label="Repository" role="img" height="16" viewBox="0 0 16 16" version="1.1" width="16" data-view-component="true" class="octicon octicon-repo js-jump-to-octicon-repo d-none flex-shrink-0"> <path fill-rule="evenodd" d="M2 2.5A2.5 2.5 0 01.4.5 0h8.75a.75.75 0 01.75.75v12.5a.75.75 0 10-1.75.75v12.5a.75.75 0 110-1.5h1.75v-2h-8a1 1 0 00-.714 1.7.75.75 0 01-1.072 1.05A2.495 2.495 0 012 11.5v-9zm10.5-1V9h-8c-.356 0-.694.074-1 .208V2.5a1 1 0 011-1h8zM5 12.25v3.25a.25.25 0 00.4.2l1.45-1.087a.25.25 0 01.3 0l.8.6 15.7a.25.25 0 00.4.2v-3.25a.25.25 0 00-.25.25z"> </path>
<svg title="Project" aria-label="Project" role="img" height="16" viewBox="0 0 16 16" version="1.1" width="16" data-view-component="true" class="octicon octicon-project js-jump-to-octicon-project d-none flex-shrink-0"> <path fill-rule="evenodd" d="M1.75 0.001 1.75v12.5c0 15.216.784 16 1.75 16h12.5A1.75 1.75 0 001-25.25h12.5a.25.25 0 00-.25.25z">
/svg title="Project" aria-label="Project" role="img" height="16" viewBox="0 0 16 16" version="1.1" width="16" data-view-component="true" class="octicon octicon-project js-jump-to-octicon-project d-none flex-shrink-0">

</

```
<img class="avatar mr-2 flex-shrink-0 js-jump-to-suggestion-avatar d-none" alt="" aria-label="Team" src="" width="28" height="28">
<div class="jump-to-suggestion-name js-jump-to-suggestion-name flex-auto overflow-hidden text-left no-wrap css-truncate css-truncate-target">
</div>
<div class="border rounded-1 flex-shrink-0 color-bg-tertiary px-1 color-text-tertiary ml-1 f6 d-none js-jump-to-badge-search">
 <span class="js-jump-to-badge-search-text-default d-none" aria-label="in this repository">
   In this repository
 </span>
 <span class="js-jump-to-badge-search-text-global d-none" aria-label="in all of GitHub">
   All GitHub
 </div>
<div aria-hidden="true" class="border rounded-1 flex-shrink-0 color-bg-tertiary px-1 color-text-tertiary ml-1 f6 d-none d-on-nav-focus js-jump-to-badge-jum</pre>
p">
 Jump to
 <span class="d-inline-block ml-1 v-align-middle">
</div>
```


cli class="d-flex flex-justify-start flex-items-center p-0 f5 navigation-item js-navigation-item js-jump-to-owner-scoped-search d-none" role="option"> <div class="jump-to-octicon js-jump-to-octicon flex-shrink-0 mr-2 text-center d-none"> <svg title="Repository" aria-label="Repository" role="img" height="16" viewBox="0 0 16 16" version="1.1" width="16" data-view-component="true" class="octicon octicon-repo js-jump-to-octicon-repo d-none flex-shrink-0"> <path fill-rule="evenodd" d="M2 2.5A2.5 2.5 0 01.4.5 0.6875a.75.75 0 01.75.7512.5a.75.75 0 00.25.252 0 00.4.25.25 0 00.4.25.25 0 00.4.25.255 0 00.4.25.255 0 00.4.25.255 0 00.4.25.255 0 00.25.2552"> </path>

<a href="mill-rule="evenodd" d="M1.75.7512.5a.25.25 0 00.25.25512.5a.25.25 0 00.25.

```
<img class="avatar mr-2 flex-shrink-0 js-jump-to-suggestion-avatar d-none" alt="" aria-label="Team" src="" width="28" height="28" >

<div class="jump-to-suggestion-name js-jump-to-suggestion-name flex-auto overflow-hidden text-left no-wrap css-truncate css-truncate-target" >

</div>
</div class="border rounded-1 flex-shrink-0 color-bg-tertiary px-1 color-text-tertiary ml-1 f6 d-none js-jump-to-badge-search" >

<span class="js-jump-to-badge-search-text-default d-none" aria-label="in this organization" >
```

```
In this organization
</span>
<span class="js-jump-to-badge-search-text-global d-none" aria-label="in all of GitHub">
All GitHub
</span>
<span aria-hidden="true" class="d-inline-block ml-1 v-align-middle">

//div>

<div aria-hidden="true" class="border rounded-1 flex-shrink-0 color-bg-tertiary px-1 color-text-tertiary ml-1 f6 d-none d-on-nav-focus js-jump-to-badge-jum p">
Jump to
<span class="d-inline-block ml-1 v-align-middle">

//div>
</div>
```


cli class="d-flex flex-justify-start flex-items-center p-0 f5 navigation-item js-navigation-item js-jump-to-global-search d-none" role="option"> <div class="jump-to-octicon js-jump-to-octicon flex-shrink-0 mr-2 text-center d-none"> <svg title="Repository" aria-label="Repository" role="img" height="16" viewBox="0 0 16 16" version="1.1" width="16" data-view-component="true" class="octicon octicon-repo js-jump-to-octicon-repo d-none flex-shrink-0"> <path fill-rule="evenodd" d="M2 2.5A2.5 2.5 0 014.5 0h8.75a.75.75 0 01.75.75v12.5a.75.75 0 110-1.5h1.75v-2h-8a1 1 0 00-.714 1.7.75.75 0 01-1.072 1.05A2.495 2.495 0 012 11.5v-9zm10.5-1V9h-8c..356 0-.694.074-1 .208V2.5a1 1 0 011-1h8zM5 12.25v3.25a.25.25 0 00.4.211.45-1.087a.25.25 0 00.13 0 la.6 15.7a.25.25 0 00.4-.2v-3.25a.25.25 0 00-.25.25h3.5a.25.25 0 00-.25.25z"> </path>
<svg title="Project" aria-label="Project" role="img" height="16" viewBox="0 0 16 16" version="1.1" width="16" data-view-component="true" class="octicon octicon-project js-jump-to-octicon-project d-none flex-shrink-0"> <path fill-rule="evenodd" d="M1.75 0 A1.75 1.75 0 000 1.75v12.5C0 15.216.784 16 1.75 16h12.5A1.75 1.75 0 0016 14.25v1.75A1.75 1.75 0 0014.25 0H1.75zM1.5 1.75 0 001.25-.25h12.5a.25.25 0 01.25.25v12.5a.25.25 0 01-.25.25H1.75a.25.25 0 01-.25.25H1.75a.375.75 0 001.5 0v-7.5a.75.75 0 001.5 0v-7.5a.7

```
<img class="avatar mr-2 flex-shrink-0 js-jump-to-suggestion-avatar d-none" alt="" aria-label="Team" src="" width="28" height="28">
<div class="jump-to-suggestion-name js-jump-to-suggestion-name flex-auto overflow-hidden text-left no-wrap css-truncate css-truncate-target">
</div>
<div class="border rounded-1 flex-shrink-0 color-bg-tertiary px-1 color-text-tertiary ml-1 f6 d-none js-jump-to-badge-search">
 <span class="js-jump-to-badge-search-text-default d-none" aria-label="in this repository">
    In this repository
  </span>
  <span class="js-jump-to-badge-search-text-global d-none" aria-label="in all of GitHub">
   All GitHub
  </span>
  <span aria-hidden="true" class="d-inline-block ml-1 v-align-middle">⟨</span>
</div>
<div aria-hidden="true" class="border rounded-1 flex-shrink-0 color-bg-tertiary px-1 color-text-tertiary ml-1 f6 d-none d-on-nav-focus js-jump-to-badge-jum</pre>
p">
 Jump to
 <span class="d-inline-block ml-1 v-align-middle"><</span>
</div>
```


</div>

</form> </div> </div>

```
</div>
  <div class="position-relative mr-3 mb-4 mb-lg-0 d-inline-block">
    <a href="/login?return to=https%3A%2F%2Fgithub.com%2FClass-3E%2FNahamCon2021-Writeups%2Ftree%2Fmaster%2Fpwn%2FtheList"</pre>
     class="HeaderMenu-link flex-shrink-0 no-underline"
     data-hydro-click="{"event_type":"authentication.click","payload":{"location_in_page":"site header menu
Writeups/tree/master/pwn/theList","user id":null}}" data-hydro-click-hmac="1a989d295b0c1e788d17c32c0198d50cc9eaec4adc4c3011ec1e38d46591beb2"
     data-ga-click="(Logged out) Header, clicked Sign in, text:sign-in">
     Sign in
    </a>
   </div>
     header-repo& source_repo=Class-3E%2FNahamCon2021-Writeups"
       {\bf class="HeaderMenu-link\ flex-shrink-0\ d-inline-block\ no-underline\ border\ color-border-default\ rounded\ px-2\ py-1"}
       data-hydro-click="{"event_type":"authentication.click","payload":{"location_in_page":"site header me
nu&quot:.&quot:repository id&quot::null.&quot:auth type&quot::&quot:SIGN UP&quot:.&quot:originating url&quot::&quot:https://github.com/Class-3E/NahamCon202
2"
       data-hydro-click="{"event_type":"analytics.event","payload":{"category":"Sign up","action&
quot;:"click to sign up for account","label":"ref page:/<user-name&gt;/&lt;repo-name&gt;/files/disambiguate;ref cta:Sign up;ref
loc:header logged out","originating url":"https://github.com/Class-3E/NahamCon2021-Writeups/tree/master/pwn/theList","user i
d":null}}" data-hydro-click-hmac="1922d915c62aafb29f21f93d297920d05c122d3e246a2f83a8897fa266b6cfd8" data-analytics-event="{"category":"
Sign up", " action": " click to sign up for account", " label": " ref_page: /< user-name&gt; /&lt; repo-name&gt; /files/disam
biguate;ref_cta:Sign up;ref_loc:header logged out"}"
      Sign up
     (/a)
```

```
</div>
```

</div> </header>

</div>

<div id="start-of-content" class="show-on-focus"></div>

```
<div data-pjax-replace id="js-flash-container">
```

<template class="js-flash-template"> <div class="flash flash-full {{ className }}}"> <div class="px-2" > <button class="flash-close js-flash-close" type="button" aria-label="Dismiss this message"> <svg aria-hidden="true" height="16" viewBox="0 0 16 16" version="1.1" width="16" data-view-component="true" class="oction octicon-x"> <path fill-rule="evenodd" d="M3.72 3.72a.75.75 0 011.06 0L8 6.94l3.22-3.22a.75.75 0 111.06 1.06L9.06 8l3.22 3.22a.75.75 0 11-1.06 1.06L8 9.06l-3.22 3.22a.75.75 0 01-1.06-1.06L6.94 8 3.72 4.78a.75.75 0 010-1.06z"></path>

```
<div>{{ message }}</div>
```

</div> </div> </template> </div>

<include-fragment class="js-notification-shelf-include-fragment" data-base-src="https://github.com/notifications/beta/shelf"></include-fragment>

< div class="application-main" data-commit-hovercards-enabled data-discussion-hovercards-enabled data-issue-and-pr-hovercards-enabled

</include-fragment>

<div id="repository-container-header" class="pt-3 hide-full-screen mb-5" style="background-color: var(--color-page-header-bg);" data-pjax-replace>

</svg> Class-3E <a data-pjax="#js-repo-pjax-container" href="/Class-3E/NahamCon2021-Writeups">NahamCon2021-Writeups

Public </h1>

```
</div>
```

 $\label{eq:location_in_page} $$ \sin^2\theta - \cos^2\theta - \cos^2\theta$

Notifications


```
<div :
```


 $1.088-.791.72-4.194L.818\ 6.374a.75.75\ 0\ 01.416-1.2814.21-.611L7.327.668A.75.75\ 0\ 018\ .25zm0\ 2.445L6.615\ 5.5a.75.75\ 0\ 01-.564.41l-3.097.45\ 2.24\ 2.184a.75.75\ 0\ 01.216.664l-.528\ 3.084\ 2.769-1.456a.75.75\ 0\ 01-.564-.41l-8\ 2.694v.001z">$

```
<span data-view-component="true">
Star
```


 0 </div>

<svg aria-hidden="true" height="16" viewBox="0 0 16 16" version="1.1" width="16" data-view-component="true" class="octioon octioon-repo-forked"> <path fill-rule="evenodd" d="M5
3.25a.75.75 0 11-1.5 0 .75.75 0 011.5 0zm0 2.122a2.25 2.25 0 10-1.5 0v.878A2.25 2.25 0 005.75 8.5h1.5v2.128a2.251 2.251 0 101.5 0V8.5h1.5a2.25 2.25 0 002.25-2.25v-.878a2.25
2.25 0 10-1.5 0v.878a.75.75 0 011-.75.75h-4.5A.75.75 0 015 6.25v-.878zm3.75 7.378a.75.75 0 11-1.5 0 .75.75 0 011.5 0zm3-8.75a.75.75 0 100-1.5.75.75 0 000 1.5z"></path>

```
Fork
```

 <a href="/Class-3E/NahamCon2021-Writeups/network/members" class="social-count" aria-label="1 user forked this repository"

```
1
```


...

```
</div>
<div id="responsive-meta-container" data-pjax-replace>
```

</div>

<nav data-pjax="#js-repo-pjax-container" aria-label="Repository" data-view-component="true" class="js-repo-nav js-sidenav-container-pjax js-responsive-underlinenav overflow-hidden UnderlineNav px-3 px-md-4 px-lg-5">

</svg> Code

-/li> data-view-component="true" class="d-inline-flex">

</svg> Issues 0

 data-view-component="true" class="d-inline-flex">

</svg> Pull requests 1

 data-view-component="true" class="d-inline-flex"> <a id="actions-tab" href="/Class-3E/NahamCon2021-Writeups/actions" data-tab-item="i3actions-tab" data-selected-links="repo actions /Class-3E/NahamCon2021-Writeups/actions" data-pjax="#repo-content-pjax-container"

data-view-component="true" class="UnderlineNav-item hx_underlinenav-item no-wrap js-responsive-underlinenav-item js-selected-navigation-item">

</svg> Actions

 data-view-component="true" class="d-inline-flex">

</svg> Projects 0

 data-view-component="true" class="d-inline-flex">

</svg> Wiki

 data-view-component="true" class="d-inline-flex">

</svg> Security <include-fragment src="/Class-3E/NahamCon2021-Writeups/security/overall-count" accept="text/fragment+html"></include-fragment>

 data-view-component="true" class="d-inline-flex">

</svg> Insights">Insights

 <div style="visibility:hidden;" data-view-component="true" class="UnderlineNav-actions js-responsive-underlinenav-overflow position-absolute pr-3 pr-md-4 pr-lg-5 right-0"> <details data-view-component="true" class="details-overlay details-reset position-relative"> <summary role="button" data-view-component="true"> <div class="UnderlineNav-item mr-0 border-0"> <svg aria-hidden="true" height="16" viewBox="0 0 16 16" version="1.1" width="16" data-view-component="true" class="oction oction-kebab-horizontal"> <path d="M8 9a1.5 1.5 0 100-3 1.5 1.5 0 100-3 1.5 1.5 0 000 3zM1.5 9a1.5 1.5 0 100-3 1.5 1.5 0 1

 data-menu-item="i1issues-tab" hidden> <a role="menuitem" class="js-selected-navigation-item dropdown-item" data-selected-links="repo_issues repo_labels repo_milestones /Class-3E/NahamCon2021-Writeups/issues" href="/Class-3E/NahamCon2021-Writeups/issues" href="/Class-3E/NahamCon2021-Writeups/pulls" href="/Class-3E/NahamCon2021-Writeups/pulls" href="/Class-3E/NahamCon2021-Writeups/pulls" href="/Class-3E/NahamCon2021-Writeups/pulls" pull requests data-menu-item="i3actions-tab" hidden> <a role="menuitem" class="js-selected-navigation-item dropdown-item" data-selected-links="repo_actions /Class-3E/NahamCon2021-Writeups/actions" href="/Class-3E/NahamCon2021-Writeups/actions" Actions data-menu-item="i4projects-tab" hidden> <a role="menuitem" class="js-selected-navigation-item dropdown-item" data-selected-links="repo_project repo_project repo_project /Class-3E/NahamCon2021-Writeups/projects" href="/Class-3E/NahamCon2021-Writeups/projects" href="/Class-3E/NahamCon2021-Writeups/projects" href="/Class-3E/NahamCon2021-Writeups/projects" href="/Class-3E/NahamCon2021-Writeups/wiki" href="/Class-3E/NahamCon2021-Writ

</details-menu></div> </details></div> </nav> </div>

<div class="clearfix new-discussion-timeline container-xl px-3 px-md-4 px-lg-5"> <div id="repo-content-pjax-container" class="repository-content" >

<div> <div class="file-navigation mb-3 d-flex flex-items-start">

<div class="position-relative"> <details class="details-reset details-overlay mr-0 mb-0 " id="branch-select-menu"> <summary class="btn css-truncate" data-hotkey="w" title="Switch branches or tags"> <svg aria-hidden="true" height="16" viewBox="0 0 16 16" version="1.1" width="16" data-view-component="true" class="oction oction-git-branch"> <path fill-rule="evenodd" d="M11.75 2.5a.75.75 0 100 1.5.75.75 0 000-1.5zm-2.25.75a2.25 2.25 0 113 2.122V6A2.5 2.5 0 0110 8.5H6a1 1 0 00-1 1v1.128a2.251 2.251 0 11-1.5 0V5.372a2.25 2.25 0 111.5 0v1.836A2.492 2.492 0 016 7h4a1 1 0 001-1v-.628A2.25 2.25 0 019.5 3.25zM4.25 12a.75.75 0 100 1.5.75.75 0 000-1.5zM3.5 3.25a.75.75 0 111.5 0 .75.75 0 01-1.5 0z"> </path> </svg> master <span class="dropdown-caret" <span class="dropdown-caret" <span cl

<div class="SelectMenu"> <div class="SelectMenu-modal"> <header class="SelectMenu-header"> Switch branches/tags <button
class="SelectMenu-closeButton" type="button" data-toggle-for="branch-select-menu"> <svg aria-label="Close menu" aria-hidden="false" role="img" height="16" viewBox="0 0 16 16"
version="1.1" width="16" data-view-component="true" class="oction octicon-x"> <path fill-rule="evenodd" d="M3.72 3.72a.75.75 0 011.06 0L8 6.94l3.22-3.22a.75.75 0 111.06
1.06L9.06 8l3.22 3.22a.75.75 0 11-1.06 1.06L8 9.06l-3.22 3.22a.75.75 0 01-1.06-1.06L6.94 8 3.72 4.78a.75.75 0 010-1.06z"> </path>

```
<input-demux data-action="tab-container-change:input-demux#storeInput tab-container-changed:input-demux#updateInput">
     <tab-container class="d-flex flex-column js-branches-tags-tabs" style="min-height: 0;">
         <div class="SelectMenu-filter">
              <input data-target="input-demux.source"</pre>
                             id="context-commitish-filter-field"
                             class="SelectMenu-input form-control"
                             aria-owns="ref-list-branches"
                             data-controls-ref-menu-id="ref-list-branches"
                             autofocus
                             autocomplete="off"
                             aria-label="Filter branches/tags"
                             placeholder="Filter branches/tags"
                             type="text"
         </div>
         <div class="SelectMenu-tabs" role="tablist" data-target="input-demux.control" >
              <button class="SelectMenu-tab" type="button" role="tab" aria-selected="true">Branches</button>
              <button class="SelectMenu-tab" type="button" role="tab">Tags</button>
         <div role="tabpanel" id="ref-list-branches" data-filter-placeholder="Filter branches/tags" class="d-flex flex-column flex-auto overflow-auto" tabindex</pre>
                 type="branch"
                 data-targets="input-demux.sinks"
                 data-action="
                      input-entered:ref-selector#inputEntered
                       tab-selected:ref-selector#tabSelected
                      focus-list:ref-selector#focusFirstListMember
                  query-endpoint="/Class-3E/NahamCon2021-Writeups/refs"
                  cache-key="v0:1615752712.2951722"
                 current-committish="bWFzdGVy"
                 default-branch="bWFzdGVy"
                  name-with-owner="Q2xhc3MtM0UvTmFoYW1Db24yMDIxLVdyaXRldXBz"
                 prefetch-on-mouseover
                  <template data-target="ref-selector.fetchFailedTemplate">
                      \verb|\div| class="SelectMenu-message"| data-index="{{ index }}" > Could not load branches < / div > Could not
                  </template>
                      <template data-target="ref-selector.noMatchTemplate">
<div class="SelectMenu-message">Nothing to show</div>
```

</template>

<circle cx="8" cy="8" r="7" stroke="currentColor" stroke-opacity="0.25" stroke-width="2" vector-effect="non-scaling-stroke" /> <path d="M15 8a7.002 7.002 0 00-7-7" stroke="currentColor" stroke-width="2" vector-effect="non-scaling-stroke" /> </svg> </div> </div>

```
<template data-target="ref-selector.itemTemplate">
```

 <svg aria-hidden="true" height="16" viewBox="0 0 16 16" version="1.1" width="16" data-view-component="true" class="octicon octicon-check SelectMenu-icon SelectMenu-icon-check"> <path fill-rule="evenodd" d="M13.78 4.22a.75.75 0 010 1.06l-7.25 7.25a.75.75 0 01-1.06 0L2.22 9.28a.75.75 0 011.06-1.06L6 10.94l6.72-6.72a.75.75 0 011.06 0z"></path> </psy {{ refName }}
frefName }}
frefName }}
frefName }
f

```
<footer class="SelectMenu-footer"><a href="/Class-3E/NahamCon2021-Writeups/branches">View all branches</a></footer>
</ref-selector>
</div>
```

```
<div role="tabpanel" id="tags-menu" data-filter-placeholder="Find a tag" class="d-flex flex-column flex-auto overflow-auto" tabindex="" hidden</pre>
 <ref-selector
   type="tag"
   data-action='
     input-entered:ref-selector#inputEntered
     tab-selected:ref-selector#tabSelected
     focus-list:ref-selector#focusFirstListMember
   data-targets="input-demux.sinks"
   query-endpoint="/Class-3E/NahamCon2021-Writeups/refs"
   cache-key="v0:1615752712.2951722"
   current-committish="bWFzdGVy
   default-branch="bWFzdGVy"
   name-with-owner="Q2xhc3MtM0UvTmFoYW1Db24yMDIxLVdyaXRldXBz"
   <template data-target="ref-selector.fetchFailedTemplate">
     <div class="SelectMenu-message" data-index="{{ index }}">Could not load tags</div>
   </template>
   <template data-target="ref-selector.noMatchTemplate">
     <div class="SelectMenu-message" data-index="{{ index }}">Nothing to show</div>
   </template>
      <template data-target="ref-selector.itemTemplate">
```

 <svg aria-hidden="true" height="16" viewBox="0 0 16 16" version="1.1" width="16" data-view-component="true" class="octicon octicon-check SelectMenu-icon SelectMenu-icon-check"> <path fill-rule="evenodd" d="M13.78 4.22a.75.75 0 010 1.06l-7.25 7.25a.75.75 0 01-1.06 0L2.22 9.28a.75.75 0 011.06-1.06L6 10.94l6.72-6.72a.75.75 0 011.06 0z"></path> </svg> {{ refName }}
frefName }}
frefName }}
frefName }
<p

<circle cx="8" cy="8" r="7" stroke="currentColor" stroke-opacity="0.25" stroke-width="2" vector-effect="non-scaling-stroke" /> <path d="M15 8a7.002 7.002 0 00-7-7"
stroke="currentColor" stroke-width="2" stroke-linecap="round" vector-effect="non-scaling-stroke" /> </svg> </div> </div> <footer class="SelectMenu-footer">View all tags</footer> </ref-selector> </div> </tab-container> </input-demux> </div> </div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></di>

</details>

</div>

 </div> </div>

<div class="f4 mt-3 mb-3 d-sm-none"><a data-pjax="true" href="/Class-3E/NahamCon2021-Writeups/<a data-pjax="true" href="/Class-3E/NahamCon2021-Writeups/tree/master/pwn">pwn/<strong class="final-path">theList/</div>

<div class="Box mb-3"> <div class="Box-header position-relative"> <h2 class="sr-only">Latest commit</h2> <div class="js-details-container Details d-flex rounded-top-1 flex-items-center flex-wrap" data-issue-and-pr-hovercards-enabled> <include-fragment src="/Class-3E/NahamCon2021-Writeups/tree-</pre>

<include-fragment src="/Class-3E/NahamCon2021-Writeups/file-list/master/pwn/theList"> Permalink

<div data-view-component="true" class="include-fragment-error flash flash-error flash-full py-2"> <svg aria-hidden="true" height="16" viewBox="0 0 16 16" version="1.1" width="16" data-view-component="true" class="octicon octicon-alert"> <path fill-rule="evenodd" d="M8.22 1.754a.25.25 0 00-.44 0L1.698 13.132a.25.25 0 00.22.368h12.164a.25.25 0 00.22.368h12.164a.25.25 0 00.22-.368L8.22 1.754zm-1.763-.707c.659-1.234 2.427-1.234 3.086 0l6.082 11.378A1.75 1.75 0 0114.082 15H1.918a1.75 1.75 0 01-1.543-2.575L6.457 1.047zM9 11a1 1 0 11-2 0 1 1 0 012 0zm-.25-5.25a.75.75 0 00-1.5 0v2.5a.75.75 0 001.5 0v-2.5z"> </path>

Failed to load latest commit information.

</div> <div class="js-details-container Details"> <div role="grid" aria-labelledby="files" class="Details-content--hidden-not-important js-navigation-container js-active-navigation-container d-block" data-pjax> <div class="sr-only" role="row"> <div role="columnheader">Type</div> <div role="columnheader">Name</div> <div role="columnheader" class="d-none d-md-block">Latest commit message</div> <div role="columnheader">Commit time</div> </div role="row" class="Box-row Box-row--focus-gray p-0 d-flex js-navigation-item"> <div role="rowheader" class="flex-auto min-width-0 col-md-2"> ... </div> <div role="gridcell" class="d-none d-md-block"> </div> <div role="gridcell"> </div> </div> <div role="gridcell"> </div> </div> <div role="gridcell"> </div> </div>

</svg> </div>

```
<div role="rowheader" class="flex-auto min-width-0 col-md-2 mr-3">
      <span class="css-truncate css-truncate-target d-block width-fit"><a class="js-navigation-open Link--primary" title="solve.py" data-pjax="#repo-cont</pre>
ent-piax-container" href="/Class-3E/NahamCon2021-Writeups/blob/master/pwn/theList/solve.pv">solve.pv</a></span>
     </div>
     <div role="gridcell" class="flex-auto min-width-0 d-none d-md-block col-5 mr-3" >
        <div class="Skeleton Skeleton--text col-7">&nbsp;</div>
     </div>
     <div role="gridcell" class="color-fg-muted text-right" style="width:100px;">
         <div class="Skeleton Skeleton--text">&nbsp;</div>
   </div>
   <div role="row" class="Box-row Box-row--focus-gray py-2 d-flex position-relative js-navigation-item ">
     <div role="gridcell" class="mr-3 flex-shrink-0" style="width: 16px;">
        <svg aria-label="File" aria-hidden="true" height="16" viewBox="0 0 16 16" version="1.1" width="16" data-view-component="true" class="oction octi</pre>
con-file color-icon-tertiary">
9c0 .138.112.25.25.25h2.19L9.5 2.06zM2 1.75C2 .784 2.784 0 3.75 0h5.086c.464 0 .909.184 1.237.51313.414 3.414c.329.328.513.773.513 1.237v8.086A1.75 1.75 0
0112.25 15h-8.5A1.75 1.75 0 012 13.25V1.75z"></path>
```

</svg> </div>

</div>

</include-fragment>

</div>

</div> </div>

</main>

</div>

</div>

<div class="footer container-xl width-full p-responsive" role="contentinfo"> <div class="position-relative d-flex flex-row-reverse flex-lq-row flex-wrap flex-lq-nowrap flex-iustify-center</p> flex-lq-justify-between pt-6 pb-2 mt-6 f6 color-fq-muted border-top color-border-muted "> <ul class="list-style-none d-flex flex-wrap col-12 col-lq-5 flex-justify-center flex-lq-justify-center flex-lq-justi between mb-2 mb-lg-0"> class="mr-3 mr-lg-0"> class="mr-3 mr-lg-0">Terms class="mr-3 mr-lg-0">Privacy class="mr-3 mr-lg-0"><a data-hydro-click=" {"event_type":"analytics.event","payload":{"Category":"Footer", "action":"go to security", "label":"text:security", "originating_url": "https://github.com/Class-3E/NahamCon2021-Writeups/tree/master/pwn/theList","user_id":null}}" data-hydro-click-hmac="ac1049c9b136cf7f623a5780fb254e10cbfb53eefa5da2d8a0a024c3ad06108c" data-analytics-event=" {"category":"Footer", "action": "go to security", "label": "text:security"}" href="https://github.com/security">Security href="https://www.githubstatus.com/" data-hydro-click="("event_type":"analytics.event","payload":{"category":"Footer","action":"go to status","label":"text:status","originating_url":"https://github.com/Class-3E/NahamCon2021-Writeups/tree/master/pwn/theList","user_id":null}}" data-hydro-clickhmac="38e1713a6b6fe194239e173a01e5940c1d2a6929fa9da54724df4a29c707faa7" data-analytics-event="{"category":"Footer", "action": "go to status","label":"text:status"}">Status <a data-ga-click="Footer, go to help, text:Docs" href="https://docs.github.com">Docs

</svg> class="mr-3 mr-lg-0">Contact GitHub class="mr-3 mr-lg-0">Pricing class="mr-3 mr-lg-0">API training","label":"text:training","originating_url":"https://github.com/Class-3E/NahamCon2021-Writeups/tree/master/pwn/theList","use__id":null}}" data-hydro-click $hmac = "306e28ed5b34242f1fdee3162963fa7e9c4fea8679f7392589a401733f1c83ad"\ data-analytics-event = "("category": "Footer", "action": "go to the context of the context of$ training","label":"text:training")">Training class="mr-3 mr-lg-0">Blog <a data-ga-click="Footer, go to about, text:about" href="https://github.com/about">About </div> <div class="d-flex flex-justify-text:blog",">Blog center pb-6"> </div> </div>

<div id="ajax-error-message" class="ajax-error-message flash flash-error" hidden> <svg aria-hidden="true" height="16" viewBox="0 0 16 16" version="1.1" width="16" data-view-component="true" class="octicon octicon-alert"> <path fill-rule="evenodd" d="M8.22 1.754a.25.25 0 00-.44 0L1.698 13.132a.25.25 0 00.22.368h12.164a.25.25 0 00.22-.368L8.22 1.754zm-1.763-.707c.659-1.234 2.427-1.234 3.086 0l6.082 11.378A1.75 1.75 0 0114.082 15H1.918a1.75 1.75 0 01-1.543-2.575L6.457 1.047zM9 11a1 1 0 11-2 0 1 1 0 012 0zm-.25-5.25a.75.75 0 00-1.5 0v2.5a.75.75 0 001.5 0v2.5a.75.75 0 001

<div class="js-stale-session-flash flash flash-warn flash-banner" hidden > <svg aria-hidden="true" height="16" viewBox="0 0 16 16" version="1.1" width="16" data-view-component="true" class="octicon octicon-alert"> <path fill-rule="evenodd" d="M8.22 1.754a.25.25 0 00-.44 0L1.698 13.132a.25.25 0 00.22.368h12.164a.25.25 0 00.22-.368L8.22 1.754zm-1.763-.707c.659-1.234 2.427-1.234 3.086 0l6.082 11.378A1.75 1.75 0 0114.082 15H1.918a1.75 1.75 0 01-1.543-2.575L6.457 1.047zM9 11a1 1 0 11-2 0 1 1 0 012 0zm-.25-5.25a.75.75 0 00-1.5 0v2.5a.75.75 0 001.5 0v-2.5z"></path> </svg> You signed in with another tab or window. >Reload to refresh your session.
/span> </fid> <details-details-details-details-details-details-details-details-overlay details-overlay details-overlay-dark lh-default color-fg-default hx_rsm" open> <summary role="button" aria-label="Close dialog">
<summary role="button" aria-label="Close dialog">
<summary role="button" aria-label="Close dialog">
<summary role="button" aria-label="true" height="16" viewBox="0 0 16 16"</p>
*to refresh your session.

<details-details-dialog class="Box Box-overlay details-overlay details-o

```
<div class="Popover js-hovercard-content position-absolute" style="display: none; outline: none;" tabindex="0">
```

<div class="Popover-message Popover-message--bottom-left Popover-message--large Box color-shadow-large" style="width:360px;"> </div> </div>

```
<template id="snippet-clipboard-copy-button">
```

<div class="zeroclipboard-container position-absolute right-0 top-0"> <clipboard-copy aria-label="Copy" class="ClipboardButton btn js-clipboard-copy m-2 p-0 tooltipped-no-delay" data-copy-feedback="Copied!" data-tooltip-direction="w"> <svg aria-hidden="true" height="16" viewBox="0 0 16 16" version="1.1" width="16" data-view-component="true" class="octicon octicon-copy js-clipboard-copy-icon m-2"> <path fill-rule="evenodd" d="M0 6.75C0 5.784.784 5 1.75 5h1.5a.75.75 0 010 1.5h-1.5a.25.25 0 00-.25.25v7.5c0</p>
.138.112.25.25.25.25h7.5a.25.25 0 00.25-.25v-1.5a.75.75 0 011.5 0v1.5A1.75 1.75 0 019.25 16h-7.5A1.75 1.75 0 010 4.25v-7.5z"> </path < path fill-rule="evenodd" d="M5 1.75C5 .784</p>
5.784 0 6.75 0h7.5C15.216 0 16 .784 16 1.75v7.5A1.75 1.75 0 0114.25 11h-7.5A1.75 1.75 0 015 9.25v-7.5zm1.75-.25a.25.25 0 00-.25.25v7.5c0 .138.112.25.25.25.25.25 0 00-.25.25bh-7.5a.25.25 0 00-.25-.25h-7.5z"> </path < /p>

clipboard-copy = /div = 10.1 mid = 1

</body> </html>

 $\label{thm:composition} {\c Original\ writeup}\ (https://github.com/Class-3E/NahamCon2021-Writeups/blob/master/pwn/theList/solve.py).$

Comments

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