# CS 410 Project One Proficiency Test Template

## Explain the functionality of the blocks of assembly code.

### “main” function”

| **Assembly Code Block** | **Explanation of Functionality** |
| --- | --- |
| <+23>: callq 0xf6a <\_Z25CheckUserPermissionAccessv>  <+34>: mov 0x20148e(%rip),%eax # 0x202300 <answer> | Calls for CheckUserPermissionAccess() to check user inputted username and password for clearance to access the data  Stores return value from method |
| <+40>: cmp $0x1,%eax  <+43>: je 0xe8a <main+64>  <+64>: mov 0x201470(%rip),%eax # 0x202300 <answer>  <+70>: cmp $0x1,%eax  <+73>: je 0xe97 <main+77>  <+75>: jmp 0xe61 <main+23>  <+77>: lea 0x5f6(%rip),%rsi # 0x1494  <+84>: lea 0x2011fb(%rip),%rdi # 0x2020a0 <\_ZSt4cout@@GLIBCXX\_3.4> | Checks the return value for equivalency. If found checks the password for equivalency. If check fails then loops back to beginning, if pass moves to prints |
| <+77>: lea 0x5f6(%rip),%rsi # 0x1494  <+84>: lea 0x2011fb(%rip),%rdi # 0x2020a0 <\_ZSt4cout@@GLIBCXX\_3.4>  <+96>: lea 0x5ff(%rip),%rsi # 0x14b0  <+103>: lea 0x2011e8(%rip),%rdi # 0x2020a0 <\_ZSt4cout@@GLIBCXX\_3.4>  <+115>: lea 0x614(%rip),%rsi # 0x14d8  <+122>: lea 0x2011d5(%rip),%rdi # 0x2020a0 <\_ZSt4cout@@GLIBCXX\_3.4>  <+134>: lea 0x625(%rip),%rsi # 0x14fc  <+141>: lea 0x2011c2(%rip),%rdi # 0x2020a0 <\_ZSt4cout@@GLIBCXX\_3.4> | Loads and prints the strings for choices and options available in the menu to pick. |
| lea 0x20140a(%rip),%rsi # 0x2022f4 <choice>  <+160>: lea 0x2012cf(%rip),%rdi # 0x2021c0 <\_ZSt3cin@@GLIBCXX\_3.4>  <+167>: callq 0xc60 <\_ZNSirsERi@plt> | Reads the choice from the user input and stores it to a reference variable. |
| mov 0x2013bd(%rip),%eax # 0x2022f4 <choice>  <+237>: cmp $0x1,%eax  <+240>: jne 0xf43 <main+249>  <+242>: callq 0x108b <\_Z11DisplayInfov> | Compares the choice made by the user and if 1 then loads loads the DisplayInfo() method |
| <+247>: jmp 0xf53 <main+265>  <+249>: mov 0x2013ab(%rip),%eax # 0x2022f4 <choice>  <+255>: cmp $0x2,%eax  <+258>: jne 0xf53 <main+265>  <+260>: callq 0x1277 <\_Z20ChangeCustomerChoicev> | If choice is equal to 2 then loads the ChangeCustomerChoice() method |
| <+265>: mov 0x20139b(%rip),%eax # 0x2022f4 <choice>  <+271>: cmp $0x3,%eax  <+274>: je 0xf63 <main+281>  <+276>: jmpq 0xe97 <main+77>  <+281>: mov $0x0,%eax | If choice is equal to 3 then exits the program. |

### ChangeCustomerChoice function

| **Assembly Code Block** | **Explanation of Functionality** |
| --- | --- |
| lea 0x346(%rip),%rsi # 0x15c8  <+11>: lea 0x200e17(%rip),%rdi # 0x2020a0 <\_ZSt4cout@@GLIBCXX\_3.4>  <+18>: callq 0xc90 <\_ZStlsISt11char\_traitsIcEERSt13basic\_ostreamIcT\_ES5\_PKc@plt>  <+23>: lea 0x201063(%rip),%rsi # 0x2022f8 <changechoice>  <+30>: lea 0x200f24(%rip),%rdi # 0x2021c0 <\_ZSt3cin@@GLIBCXX\_3.4>  <+37>: callq 0xc60 <\_ZNSirsERi@plt> | Prints string to choose customer and accepts an input for the customer choice |
| lea 0x358(%rip),%rsi # 0x1600  <+49>: lea 0x200df1(%rip),%rdi # 0x2020a0 <\_ZSt4cout@@GLIBCXX\_3.4>  <+56>: callq 0xc90 <\_ZStlsISt11char\_traitsIcEERSt13basic\_ostreamIcT\_ES5\_PKc@plt>  <+61>: lea 0x201041(%rip),%rsi # 0x2022fc <newservice>  <+68>: lea 0x200efe(%rip),%rdi # 0x2021c0 <\_ZSt3cin@@GLIBCXX\_3.4>  <+75>: callq 0xc60 <\_ZNSirsERi@plt> | Prints for the user to select a choice for service and stores the choice value |
| <+80>: mov 0x20102b(%rip),%eax # 0x2022f8 <changechoice>  <+86>: cmp $0x1,%eax  <+89>: jne 0x12e0 <\_Z20ChangeCustomerChoicev+105>  <+91>: mov 0x201024(%rip),%eax # 0x2022fc <newservice>  <+97>: mov %eax,0x200d82(%rip) # 0x202060 <num1>  <+103>: jmp 0x1342 <\_Z20ChangeCustomerChoicev+203> | Compares user choice to value 1, if 1 changes the service value associated with that user, if not 1 moves to next loop |
| <+105>: mov 0x201012(%rip),%eax # 0x2022f8 <changechoice>  <+111>: cmp $0x2,%eax  <+114>: jne 0x12f9 <\_Z20ChangeCustomerChoicev+130>  <+116>: mov 0x20100b(%rip),%eax # 0x2022fc <newservice>  <+122>: mov %eax,0x200d6d(%rip) # 0x202064 <num2>  <+128>: jmp 0x1342 <\_Z20ChangeCustomerChoicev+203> | Compares user choice to 2, if 2 changes to the appropriate service, if not moves to next loop |

### CheckUserPermissonAccess Function

| **Assembly Code Block** | **Explanation of Functionality** |
| --- | --- |
| <+85>: lea 0x2010da(%rip),%rdi # 0x2020a0 <\_ZSt4cout@@GLIBCXX\_3.4>  <+92>: callq 0xc90 <\_ZStlsISt11char\_traitsIcEERSt13basic\_ostreamIcT\_ES5\_PKc@plt>  <+97>: lea 0x20130e(%rip),%rsi # 0x2022e0 <username>  <+104>: lea 0x2011e7(%rip),%rdi # 0x2021c0 <\_ZSt3cin@@GLIBCXX\_3.4>  <+111>: callq 0xc40 | Prints output to prompt user to enter a username, stores the user input to a variable |
| <+116>: lea 0x558(%rip),%rsi # 0x153d  <+123>: lea 0x2010b4(%rip),%rdi # 0x2020a0 <\_ZSt4cout@@GLIBCXX\_3.4>  <+130>: callq 0xc90 <\_ZStlsISt11char\_traitsIcEERSt13basic\_ostreamIcT\_ES5\_PKc@plt>  <+135>: lea -0x40(%rbp),%rax  <+139>: mov %rax,%rsi  <+142>: lea 0x2011c1(%rip),%rdi # 0x2021c0 <\_ZSt3cin@@GLIBCXX\_3.4>  <+149>: callq 0xcd0 | Prints prompt for user password. Accepts user input of password and stores to variable |
| <+176>: cmpl $0x0,-0x44(%rbp)  <+180>: jne 0x1027 <\_Z25CheckUserPermissionAccessv+189>  <+182>: mov $0x1,%ebx  <+187>: jmp 0x102c <\_Z25CheckUserPermissionAccessv+194>  <+189>: mov $0x2,%ebx  <+194>: lea -0x40(%rbp),%rax  <+198>: mov %rax,%rdi | Compares the results of the input to those stored in memory. Sets a value to ebx register to return and be used in main function. |

### DisplayInfo Function

| **Assembly Code Block** | **Explanation of Functionality** |
| --- | --- |
| <+63>: lea 0x200f3f(%rip),%rsi # 0x202010 <name1>  <+73>: callq 0xc90  <+78>: lea 0x4c0(%rip),%rsi # 0x15a0  <+96>: mov 0x200f6f(%rip),%eax # 0x202060 <num1>  <+107>: callq 0xd00 <\_ZNSolsEi@plt> | Loads the first entry in the list and prints the name, loads the numerical choice associated with the index and prints the number. |
| lea 0x200ef6(%rip),%rsi # 0x202020 <name2>  <+162>: callq 0xc90  <+167>: lea 0x467(%rip),%rsi # 0x15a0  <+185>: mov 0x200f1a(%rip),%eax # 0x202064 <num2  <+196>: callq 0xd00 <\_ZNSolsEi@plt> | Loads the second entry in the list and prints the name, loads the numerical choice associated with the index and prints the number. |
| <+241>: lea 0x200ead(%rip),%rsi # 0x202030 <name3>  <+251>: callq 0xc90  <+256>: lea 0x40e(%rip),%rsi # 0x15a0  <+274>: mov 0x200ec5(%rip),%eax # 0x202068 <num3>  <+285>: callq 0xd00 <\_ZNSolsEi@plt> | Loads the third in the list and prints the name, loads the numerical choice associated with the index and prints the number. |
| <+330>: lea 0x200e64(%rip),%rsi # 0x202040 <name4>  <+340>: callq 0xc90  <+345>: lea 0x3b5(%rip),%rsi # 0x15a0  <+363>: mov 0x200e70(%rip),%eax # 0x20206c <num4>  <+374>: callq 0xd00 <\_ZNSolsEi@plt> | Loads the fourth entry in the list and prints the name, loads the numerical choice associated with the index and prints the number. |
| <+419>: lea 0x200e1b(%rip),%rsi # 0x202050 <name5>  <+429>: callq 0xc90  <+434>: lea 0x35c(%rip),%rsi # 0x15a0  <+444>: callq 0xc90  <+452>: mov 0x200e1b(%rip),%eax # 0x202070 <num5>  <+463>: callq 0xd00 <\_ZNSolsEi@plt> | Loads the fifth entry in the list and prints the name, loads the numerical choice associated with the index and prints the number. |