# CS 410 Project One Proficiency Test

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

### “main” function”

| **Assembly Code Block** | **Explanation of Functionality** |
| --- | --- |
| <+0>: push %rbp  <+1>: mov %rsp,%rbp  <+4>: lea 0x5eb(%rip),%rsi # 0x1440  <+11>: lea 0x201244(%rip),%rdi # 0x2020a0 <\_ZSt4cout@@GLIBCXX\_3.4>  <+18>: callq 0xc90 <\_ZStlsISt11char\_traitsIcEERSt13basic\_ostreamIcT\_ES5\_PKc@plt>  <+23>: callq 0xf6a <\_Z25CheckUserPermissionAccessv> | Push rbp to the top of the stack  move rsp into rbp  load 0x5eb(%rip) into rsi  load 0x201244(%rip) into rdi (cout statement)  call function (cout function)  call the CheckUserPermissionAccess function |
| <+45>: lea 0x5f2(%rip),%rsi # 0x1470  <+52>: lea 0x20121b(%rip),%rdi # 0x2020a0 <\_ZSt4cout@@GLIBCXX\_3.4>  <+59>: callq 0xc90 <\_ZStlsISt11char\_traitsIcEERSt13basic\_ostreamIcT\_ES5\_PKc@plt>  <+64>: mov 0x201470(%rip),%eax # 0x202300 <answer>  <+70>: cmp $0x1,%eax  <+73>: je 0xe97 <main+77>  <+75>: jmp 0xe61 <main+23> | load 0x5f2(%rip) into rsi  load 0x20121b(%rip) into rdi (cout statement)  call function (cout)  move 0x201470(%rip) into eax  compare 0x1 with eax  jump to +77 if equal  jump to +23 (if the jump to 77 does not occur) |
| <+153>: lea 0x20140a(%rip),%rsi # 0x2022f4 <choice>  <+160>: lea 0x2012cf(%rip),%rdi # 0x2021c0 <\_ZSt3cin@@GLIBCXX\_3.4>  <+167>: callq 0xc60 <\_ZNSirsERi@plt>  <+172>: lea 0x61d(%rip),%rsi # 0x151a  <+179>: lea 0x20119c(%rip),%rdi # 0x2020a0 <\_ZSt4cout@@GLIBCXX\_3.4>  <+186>: callq 0xc90 <\_ZStlsISt11char\_traitsIcEERSt13basic\_ostreamIcT\_ES5\_PKc@plt> | load 0x20140a(%rip) into rsi (user choice)  load 0x2012cf(%rip) into rdi (cin function)  call function (cin)  load 0x61d(%rip) into rsi  load 0x20119c(%rip) into rdi (cout)  call function (cout) |
| <+226>: callq 0xca0 <\_ZNSolsEPFRSoS\_E@plt>  <+231>: mov 0x2013bd(%rip),%eax # 0x2022f4 <choice>  <+237>: cmp $0x1,%eax  <+240>: jne 0xf43 <main+249>  <+242>: callq 0x108b <\_Z11DisplayInfov>  <+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>  <+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  <+286>: pop %rbp  <+287>: retq | call function  move 0x2013bd(%rip) into eax (choice)  compare 0x1 with eax  jump to +249 if not equal  call DisplayInfo function (if equal to 1)  jump to +265  move 0x2013ab(%rip) into eax (choice)  compare eax with 2  jump to +265 if not equal  call ChangeCustomerChoice function (if equal to 2)  move 0x20139b(%rip) into eax (choice)  compare eax with 3  jump to +281 if equal  jump to +77 (if not equal)  move 0x0 into eax  pop rbp off the stack  return |

### ChangeCustomerChoice function

| **Assembly Code Block** | **Explanation of Functionality** |
| --- | --- |
| <+191>: mov %rax,%rdx  <+194>: mov 0x2013e2(%rip),%eax # 0x2022f4 <choice>  <+200>: mov %eax,%esi  <+202>: mov %rdx,%rdi  <+205>: callq 0xd00 <\_ZNSolsEi@plt>  <+210>: mov %rax,%rdx  <+213>: mov 0x2010aa(%rip),%rax # 0x201fd0  <+220>: mov %rax,%rsi  <+223>: mov %rdx,%rdi | move rax into rdx  move 0x2013e2(%rip) into eax (user choice)  move eax into esi  move rdx into rdi  call function  move rax into rdx  move 0x2010aa(%rip) into rax  move rax into rsi  move rdx into rdi |

### CheckUserPermissonAccess Function

| **Assembly Code Block** | **Explanation of Functionality** |
| --- | --- |
| <+28>: mov %eax,0x201494(%rip) # 0x202300 <answer>  <+34>: mov 0x20148e(%rip),%eax # 0x202300 <answer>  <+40>: cmp $0x1,%eax  <+43>: je 0xe8a <main+64> | move eax into 0x201494(%rip)  move 0x20148e(%rip) into eax  compare 0x1 with eax  jump to +64 if equal |

### DisplayInfo Function

| **Assembly Code Block** | **Explanation of Functionality** |
| --- | --- |
| <+77>: lea 0x5f6(%rip),%rsi # 0x1494  <+84>: lea 0x2011fb(%rip),%rdi # 0x2020a0 <\_ZSt4cout@@GLIBCXX\_3.4>  <+91>: callq 0xc90 <\_ZStlsISt11char\_traitsIcEERSt13basic\_ostreamIcT\_ES5\_PKc@plt>  <+96>: lea 0x5ff(%rip),%rsi # 0x14b0  <+103>: lea 0x2011e8(%rip),%rdi # 0x2020a0 <\_ZSt4cout@@GLIBCXX\_3.4>  <+110>: callq 0xc90 <\_ZStlsISt11char\_traitsIcEERSt13basic\_ostreamIcT\_ES5\_PKc@plt>  <+115>: lea 0x614(%rip),%rsi # 0x14d8  <+122>: lea 0x2011d5(%rip),%rdi # 0x2020a0 <\_ZSt4cout@@GLIBCXX\_3.4>  <+129>: callq 0xc90 <\_ZStlsISt11char\_traitsIcEERSt13basic\_ostreamIcT\_ES5\_PKc@plt>  <+134>: lea 0x625(%rip),%rsi # 0x14fc  <+141>: lea 0x2011c2(%rip),%rdi # 0x2020a0 <\_ZSt4cout@@GLIBCXX\_3.4>  <+148>: callq 0xc90 <\_ZStlsISt11char\_traitsIcEERSt13basic\_ostreamIcT\_ES5\_PKc@plt> | load 0x5f6(%rip) into rsi  load 0x2011fb(%rip) into rdi (cout statement)  call function (cout)  load 0x5ff(%rip) into rsi  load 0x2011e8(%rip) into rdi (cout)  call function (cout)  load 0x614(%rip) into rsi  load 0x2011d5(%rip) into rdi (cout)  call function (cout)  load 0x625(%rip) into rsi  load 0x2011c2(%rip) into rdi (cout)  call function (cout) |