

```
import os

!apt-get install -y plantuml

uml_code = """
@startuml
left to right direction
actor Customer
actor BankEmployee
rectangle "Online Banking System" {
    usecase "Register Account" as UC1
    usecase "Login" as UC2
    usecase "Check Account Balance" as UC3
    usecase "Transfer Funds" as UC4
    usecase "Pay Bills" as UC5
    usecase "View Transaction History" as UC6
    usecase "Apply for Loan" as UC7
    usecase "Manage Beneficiaries" as UC8
    usecase "Logout" as UC9
    usecase "Approve Loan Application" as UC10
    usecase "Reset Password" as UC11
}
Customer -- UC1
Customer -- UC2
Customer -- UC3
Customer -- UC4
Customer -- UC5
Customer -- UC6
Customer -- UC7
Customer -- UC8
Customer -- UC9
Customer -- UC11
BankEmployee -- UC10
UC7 ..> UC10 : "Requires Approval"
UC2 ..> UC11 : "Forgot Password?"
@enduml
"""

uml_file_path = "/content/diagram.puml"
with open(uml_file_path, "w") as file:
    file.write(uml_code)

os.system(f"plantuml {uml_file_path}")

from IPython.display import Image
Image(filename="/content/diagram.png")
```



```

Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  binfmt-support default-jdk default-jdk-headless default-jre default-jre-headless ditaa fastjar
  fonts-dejavu-core fonts-dejavu-extra icc-profiles-free jarwrapper java-wrappers junit4
  libapache-pom-java libatk-wrapper-java libatk-wrapper-java-jni libavalon-framework-java
  libbatik-java libcommons-cli-java libcommons-io-java libcommons-logging-java
  libcommons-parent-java libfontbox2-java libfontenc1 libfop-java libhamcrest-java libice-dev
  libjaxp1.3-java libjericho-html-java libjlatexmath-java libqdox-java libsaxon-java libsm-dev
  libxalan2-java libxerces2-java libxkbfile1 libxml-commons-external-java
  libxml-commons-resolver1.1-java libxmlgraphics-commons-java libxt-dev libxtst6 libxxf86dga1
  openjdk-11-jdk openjdk-11-jre x11-utils
Suggested packages:
  libavalon-framework-java-doc librhino-java libcommons-io-java-doc libcommons-logging-java-doc
  libexcalibur-logkit-java liblog4j1.2-java libice-doc libqdox-java-doc ant junit libjdom1-java
  libsaxon-java-doc libsm-doc libxalan2-java-doc libbsf-java libxslt-java libxerces2-java-doc
  libxml-commons-resolver1.1-java-doc libxmlgraphics-commons-java-doc libxt-doc openjdk-11-demo
  openjdk-11-source visualvm mesa-utils
The following NEW packages will be installed:
  binfmt-support default-jdk default-jdk-headless default-jre default-jre-headless ditaa fastjar
  fonts-dejavu-core fonts-dejavu-extra icc-profiles-free jarwrapper java-wrappers junit4
  libapache-pom-java libatk-wrapper-java libatk-wrapper-java-jni libavalon-framework-java
  libbatik-java libcommons-cli-java libcommons-io-java libcommons-logging-java
  libcommons-parent-java libfontbox2-java libfontenc1 libfop-java libhamcrest-java libice-dev
  libjaxp1.3-java libjericho-html-java libjlatexmath-java libqdox-java libsaxon-java libsm-dev
  libxalan2-java libxerces2-java libxkbfile1 libxml-commons-external-java
  libxml-commons-resolver1.1-java libxmlgraphics-commons-java libxt-dev libxtst6 libxxf86dga1
  openjdk-11-jdk openjdk-11-jre plantuml x11-utils
0 upgraded, 46 newly installed, 0 to remove and 29 not upgraded.
Need to get 38.7 MB of archives.
After this operation, 69.1 MB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu jammy/main amd64 binfmt-support amd64 2.2.1-2 [55.8 kB]
Get:2 http://archive.ubuntu.com/ubuntu jammy/main amd64 default-jre-headless amd64 2:1.11-72build2 [3,042 B]
Get:3 http://archive.ubuntu.com/ubuntu jammy/main amd64 libxtst6 amd64 2:1.2.3-1build4 [13.4 kB]
Get:4 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 openjdk-11-jre amd64 11.0.26+4-1ubuntu1~22.04 [214 kB]
Get:5 http://archive.ubuntu.com/ubuntu jammy/main amd64 default-jre amd64 2:1.11-72build2 [896 B]
Get:6 http://archive.ubuntu.com/ubuntu jammy/main amd64 default-jdk-headless amd64 2:1.11-72build2 [942 B]
Get:7 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 openjdk-11-jdk amd64 11.0.26+4-1ubuntu1~22.04 [1,341 kB]
Get:8 http://archive.ubuntu.com/ubuntu jammy/main amd64 default-jdk amd64 2:1.11-72build2 [908 B]
Get:9 http://archive.ubuntu.com/ubuntu jammy/universe amd64 fastjar amd64 2:0.98-7 [67.1 kB]
Get:10 http://archive.ubuntu.com/ubuntu jammy/universe amd64 jarwrapper all 0.78 [10.8 kB]
Get:11 http://archive.ubuntu.com/ubuntu jammy/universe amd64 libhamcrest-java all 1.3-9 [386 kB]
Get:12 http://archive.ubuntu.com/ubuntu jammy/universe amd64 junit4 all 4.13.2-1 [344 kB]
Get:13 http://archive.ubuntu.com/ubuntu jammy/universe amd64 java-wrappers all 0.3 [9,560 B]
Get:14 http://archive.ubuntu.com/ubuntu jammy/universe amd64 libjaxp1.3-java all 1.3.05-6 [227 kB]
Get:15 http://archive.ubuntu.com/ubuntu jammy/universe amd64 libxml-commons-external-java all 1.4.01-5 [240 kB]
Get:16 http://archive.ubuntu.com/ubuntu jammy/universe amd64 libxml-commons-resolver1.1-java all 1.2-11 [97.6 kB]
Get:17 http://archive.ubuntu.com/ubuntu jammy/universe amd64 libxerces2-java all 2.12.1-1 [1,437 kB]
Get:18 http://archive.ubuntu.com/ubuntu jammy/universe amd64 libxalan2-java all 2.7.2-4 [3,416 kB]
Get:19 http://archive.ubuntu.com/ubuntu jammy/universe amd64 libapache-pom-java all 18-1 [4,720 B]
Get:20 http://archive.ubuntu.com/ubuntu jammy/universe amd64 libcommons-parent-java all 43-1 [10.8 kB]
Get:21 http://archive.ubuntu.com/ubuntu jammy/universe amd64 libcommons-io-java all 2.11.0-2 [297 kB]
Get:22 http://archive.ubuntu.com/ubuntu jammy/universe amd64 libcommons-logging-java all 1.2-2 [60.3 kB]
Get:23 http://archive.ubuntu.com/ubuntu jammy/universe amd64 libxmlgraphics-commons-java all 2.6-1 [612 kB]
Get:24 http://archive.ubuntu.com/ubuntu jammy-updates/universe amd64 libbatik-java all 1.14-1ubuntu0.2 [3,866 kB]
Get:25 http://archive.ubuntu.com/ubuntu jammy/universe amd64 libcommons-cli-java all 1.4-2 [55.8 kB]
Get:26 http://archive.ubuntu.com/ubuntu jammy/universe amd64 libjericho-html-java all 3.2-2 [185 kB]
Get:27 http://archive.ubuntu.com/ubuntu jammy/universe amd64 ditaa all 0.10+ds1-1.2 [129 kB]
Get:28 http://archive.ubuntu.com/ubuntu jammy/main amd64 fonts-dejavu-core all 2.37-2build1 [1,041 kB]
Get:29 http://archive.ubuntu.com/ubuntu jammy/main amd64 fonts-dejavu-extra all 2.37-2build1 [2,041 kB]
Get:30 http://archive.ubuntu.com/ubuntu jammy/main amd64 icc-profiles-free all 2.0.1+dfs-g1 [214 kB]
Get:31 http://archive.ubuntu.com/ubuntu jammy/main amd64 libfontenc1 amd64 1:1.1.4-1build3 [14.7 kB]
Get:32 http://archive.ubuntu.com/ubuntu jammy/main amd64 libxkbfile1 amd64 1:1.1.0-1build3 [71.8 kB]
Get:33 http://archive.ubuntu.com/ubuntu jammy/main amd64 libxxf86dga1 amd64 2:1.1.5-0ubuntu3 [12.6 kB]
Get:34 http://archive.ubuntu.com/ubuntu jammy/main amd64 x11-utils amd64 7.7+5build2 [206 kB]
Get:35 http://archive.ubuntu.com/ubuntu jammy/main amd64 libatk-wrapper-java all 0.38.0-5build1 [53.1 kB]
Get:36 http://archive.ubuntu.com/ubuntu jammy/main amd64 libatk-wrapper-java-jni amd64 0.38.0-5build1 [49.0 kB]
Get:37 http://archive.ubuntu.com/ubuntu jammy/universe amd64 libavalon-framework-java all 4.2.0-10 [71.3 kB]
Get:38 http://archive.ubuntu.com/ubuntu jammy/universe amd64 libfontbox2-java all 2.0.25-1 [1,502 kB]
Get:39 http://archive.ubuntu.com/ubuntu jammy/universe amd64 libqdox-java all 1.12.1-3 [172 kB]
Get:40 http://archive.ubuntu.com/ubuntu jammy/universe amd64 libfop-java all 1:2.6-2 [10.1 MB]
Get:41 http://archive.ubuntu.com/ubuntu jammy/main amd64 libice-dev amd64 2:1.0.10-1build2 [51.4 kB]
Get:42 http://archive.ubuntu.com/ubuntu jammy/universe amd64 libjlatexmath-java all 1.0.7-3 [990 kB]
Get:43 http://archive.ubuntu.com/ubuntu jammy/universe amd64 libsaxon-java all 1:6.5.5-12 [574 kB]
Get:44 http://archive.ubuntu.com/ubuntu jammy/main amd64 libsm-dev amd64 2:1.2.3-1build2 [18.1 kB]
Get:45 http://archive.ubuntu.com/ubuntu jammy/main amd64 libxt-dev amd64 1:1.2.1-1 [396 kB]
Get:46 http://archive.ubuntu.com/ubuntu jammy/universe amd64 plantuml all 1:1.2020.2+ds-1 [8,035 kB]
Fetched 38.7 MB in 3s (12.3 MB/s)
Extracting templates from packages: 100%
Selecting previously unselected package binfmt-support.
(Reading database ... 124947 files and directories currently installed.)
Preparing to unpack .../00-binfmt-support_2.2.1-2_amd64.deb ...
Unpacking binfmt-support (2.2.1-2) ...
Selecting previously unselected package default-jre-headless.
Preparing to unpack .../01-default-jre-headless_2%3a1.11-72build2_amd64.deb ...
Unpacking default-jre-headless (2:1.11-72build2) ...
Selecting previously unselected package libxtst6:amd64.
Preparing to unpack .../02-libxtst6_2%3a1.2.3-1build4_amd64.deb ...
Unpacking libxtst6:amd64 (2:1.2.3-1build4) ...

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Selecting previously unselected package openjdk-11-jre:amd64.
Preparing to unpack .../03-openjdk-11-jre_11.0.26+4-1ubuntu1~22.04_amd64.deb ...
Unpacking openjdk-11-jre:amd64 (11.0.26+4-1ubuntu1~22.04) ...
Selecting previously unselected package default-jre.
Preparing to unpack .../04-default-jre_2%3a1.11-72build2_amd64.deb ...
Unpacking default-jre (2:1.11-72build2) ...
Selecting previously unselected package default-jdk-headless.
Preparing to unpack .../05-default-jdk-headless_2%3a1.11-72build2_amd64.deb ...
Unpacking default-jdk-headless (2:1.11-72build2) ...
Selecting previously unselected package openjdk-11-jdk:amd64.
Preparing to unpack .../06-openjdk-11-jdk_11.0.26+4-1ubuntu1~22.04_amd64.deb ...
Unpacking openjdk-11-jdk:amd64 (11.0.26+4-1ubuntu1~22.04) ...
Selecting previously unselected package default-jdk.
Preparing to unpack .../07-default-jdk_2%3a1.11-72build2_amd64.deb ...
Unpacking default-jdk (2:1.11-72build2) ...
Selecting previously unselected package fastjar.
Preparing to unpack .../08-fastjar_2%3a0.98-7_amd64.deb ...
Unpacking fastjar (2:0.98-7) ...
Selecting previously unselected package jarwrapper.
Preparing to unpack .../09-jarwrapper_0.78_all.deb ...
Unpacking jarwrapper (0.78) ...
Selecting previously unselected package libhamcrest-java.
Preparing to unpack .../10-libhamcrest-java_1.3-9_all.deb ...
Unpacking libhamcrest-java (1.3-9) ...
Selecting previously unselected package junit4.
Preparing to unpack .../11-junit4_4.13.2-1_all.deb ...
Unpacking junit4 (4.13.2-1) ...
Selecting previously unselected package java-wrappers.
Preparing to unpack .../12-java-wrappers_0.3_all.deb ...
Unpacking java-wrappers (0.3) ...
Selecting previously unselected package libjaxp1.3-java.
Preparing to unpack .../13-libjaxp1.3-java_1.3.05-6_all.deb ...
Unpacking libjaxp1.3-java (1.3.05-6) ...
Selecting previously unselected package libxml-commons-external-java.
Preparing to unpack .../14-libxml-commons-external-java_1.4.01-5_all.deb ...
Unpacking libxml-commons-external-java (1.4.01-5) ...
Selecting previously unselected package libxml-commons-resolver1.1-java.
Preparing to unpack .../15-libxml-commons-resolver1.1-java_1.2-11_all.deb ...
Unpacking libxml-commons-resolver1.1-java (1.2-11) ...
Selecting previously unselected package libxerces2-java.
Preparing to unpack .../16-libxerces2-java_2.12.1-1_all.deb ...
Unpacking libxerces2-java (2.12.1-1) ...
Selecting previously unselected package libxalan2-java.
Preparing to unpack .../17-libxalan2-java_2.7.2-4_all.deb ...
Unpacking libxalan2-java (2.7.2-4) ...
Selecting previously unselected package libapache-pom-java.
Preparing to unpack .../18-libapache-pom-java_18-1_all.deb ...
Unpacking libapache-pom-java (18-1) ...
Selecting previously unselected package libcommons-parent-java.
Preparing to unpack .../19-libcommons-parent-java_43-1_all.deb ...
Unpacking libcommons-parent-java (43-1) ...
Selecting previously unselected package libcommons-io-java.
Preparing to unpack .../20-libcommons-io-java_2.11.0-2_all.deb ...
Unpacking libcommons-io-java (2.11.0-2) ...
Selecting previously unselected package libcommons-logging-java.
Preparing to unpack .../21-libcommons-logging-java_1.2-2_all.deb ...
Unpacking libcommons-logging-java (1.2-2) ...
Selecting previously unselected package libxmlgraphics-commons-java.
Preparing to unpack .../22-libxmlgraphics-commons-java_2.6-1_all.deb ...
Unpacking libxmlgraphics-commons-java (2.6-1) ...
Selecting previously unselected package libbatik-java.
Preparing to unpack .../23-libbatik-java_1.14-1ubuntu0.2_all.deb ...
Unpacking libbatik-java (1.14-1ubuntu0.2) ...
Selecting previously unselected package libcommons-cli-java.
Preparing to unpack .../24-libcommons-cli-java_1.4-2_all.deb ...
Unpacking libcommons-cli-java (1.4-2) ...
Selecting previously unselected package libjericho-html-java.
Preparing to unpack .../25-libjericho-html-java_3.2-2_all.deb ...
Unpacking libjericho-html-java (3.2-2) ...
Selecting previously unselected package ditaa.
Preparing to unpack .../26-ditaa_0.10+ds1-1.2_all.deb ...
Unpacking ditaa (0.10+ds1-1.2) ...
Selecting previously unselected package fonts-dejavu-core.
Preparing to unpack .../27-fonts-dejavu-core_2.37-2build1_all.deb ...
Unpacking fonts-dejavu-core (2.37-2build1) ...
Selecting previously unselected package fonts-dejavu-extra.
Preparing to unpack .../28-fonts-dejavu-extra_2.37-2build1_all.deb ...
Unpacking fonts-dejavu-extra (2.37-2build1) ...
Selecting previously unselected package icc-profiles-free.
Preparing to unpack .../29-icc-profiles-free_2.0.1+dfsg-1.1_all.deb ...
Unpacking icc-profiles-free (2.0.1+dfsg-1.1) ...
Selecting previously unselected package libfontenc1:amd64.
Preparing to unpack .../30-libfontenc1_1%3a1.1.4-1build3_amd64.deb ...
Unpacking libfontenc1:amd64 (1:1.1.4-1build3) ...
Selecting previously unselected package libxkbfile1:amd64.
Preparing to unpack .../31-libxkbfile1_1%3a1.1.0-1build3_amd64.deb ...
Unpacking libxkbfile1:amd64 (1:1.1.0-1build3) ...
Selecting previously unselected package libxxf86dga1:amd64.
Preparing to unpack .../32-libxxf86dga1_2%3a1.1.5-0ubuntu3_amd64.deb ...
Unpacking libxxf86dga1:amd64 (2:1.1.5-0ubuntu3) ...
Selecting previously unselected package x11-utils.
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Preparing to unpack .../33-x11-utils_7.7+5build2_amd64.deb ...
Unpacking x11-utils (7.7+5build2) ...
Selecting previously unselected package libatk-wrapper-java.
Preparing to unpack .../34-libatk-wrapper-java_0.38.0-5build1_all.deb ...
Unpacking libatk-wrapper-java (0.38.0-5build1) ...
Selecting previously unselected package libatk-wrapper-java-jni:amd64.
Preparing to unpack .../35-libatk-wrapper-java-jni_0.38.0-5build1_amd64.deb ...
Unpacking libatk-wrapper-java-jni:amd64 (0.38.0-5build1) ...
Selecting previously unselected package libavalon-framework-java.
Preparing to unpack .../36-libavalon-framework-java_4.2.0-10_all.deb ...
Unpacking libavalon-framework-java (4.2.0-10) ...
Selecting previously unselected package libfontbox2-java.
Preparing to unpack .../37-libfontbox2-java_2.0.25-1_all.deb ...
Unpacking libfontbox2-java (2.0.25-1) ...
Selecting previously unselected package libqdox-java.
Preparing to unpack .../38-libqdox-java_1.12.1-3_all.deb ...
Unpacking libqdox-java (1.12.1-3) ...
Selecting previously unselected package libfop-java.
Preparing to unpack .../39-libfop-java_1%3a2.6-2_all.deb ...
Unpacking libfop-java (1:2.6-2) ...
Selecting previously unselected package libice-dev:amd64.
Preparing to unpack .../40-libice-dev_2%3a1.0.10-1build2_amd64.deb ...
Unpacking libice-dev:amd64 (2:1.0.10-1build2) ...
Selecting previously unselected package libjlatexmath-java.
Preparing to unpack .../41-libjlatexmath-java_1.0.7-3_all.deb ...
Unpacking libjlatexmath-java (1.0.7-3) ...
Selecting previously unselected package libsaxon-java.
Preparing to unpack .../42-libsaxon-java_1%3a6.5.5-12_all.deb ...
Unpacking libsaxon-java (1:6.5.5-12) ...
Selecting previously unselected package libsm-dev:amd64.
Preparing to unpack .../43-libsm-dev_2%3a1.2.3-1build2_amd64.deb ...
Unpacking libsm-dev:amd64 (2:1.2.3-1build2) ...
Selecting previously unselected package libxt-dev:amd64.
Preparing to unpack .../44-libxt-dev_1%3a1.2.1-1_amd64.deb ...
Unpacking libxt-dev:amd64 (1:1.2.1-1) ...
Selecting previously unselected package plantuml.
Preparing to unpack .../45-plantuml_1%3a1.2020.2+ds-1_all.deb ...
Unpacking plantuml (1:1.2020.2+ds-1) ...
Setting up fastjar (2:0.98-7) ...
Setting up libqdox-java (1.12.1-3) ...
Setting up java-wrappers (0.3) ...
Setting up default-jre-headless (2:1.11-72build2) ...
Setting up libice-dev:amd64 (2:1.0.10-1build2) ...
Setting up libcommons-cli-java (1.4-2) ...
Setting up libsaxon-java (1:6.5.5-12) ...
Setting up libsm-dev:amd64 (2:1.2.3-1build2) ...
Setting up libxtst6:amd64 (2:1.2.3-1build4) ...
Setting up libxxf86dga1:amd64 (2:1.1.5-0ubuntu3) ...
Setting up openjdk-11-jre:amd64 (11.0.26+4-1ubuntu1~22.04) ...
Setting up default-jre (2:1.11-72build2) ...
Setting up libjericho-html-java (3.2-2) ...
Setting up libfontbox2-java (2.0.25-1) ...
Setting up libfontenc1:amd64 (1:1.1.4-1build3) ...
Setting up default-jdk-headless (2:1.11-72build2) ...
Setting up libxt-dev:amd64 (1:1.2.1-1) ...
Setting up libapache-pom-java (18-1) ...
Setting up icc-profiles-free (2.0.1+dfsg-1.1) ...
Setting up libxml-commons-resolver1.1-java (1.2-11) ...
Setting up binfmt-support (2.2.1-2) ...
invoke-rc.d: could not determine current runlevel
invoke-rc.d: policy-rc.d denied execution of restart.
Created symlink /etc/systemd/system/multi-user.target.wants/binfmt-support.service → /lib/systemd/system/binfmt-support.service.
Setting up fonts-dejavu-core (2.37-2build1) ...
Setting up libhamcrest-java (1.3-9) ...
Setting up fonts-dejavu-extra (2.37-2build1) ...
Setting up libxml-commons-external-java (1.4.01-5) ...
Setting up libavalon-framework-java (4.2.0-10) ...
Setting up openjdk-11-jdk:amd64 (11.0.26+4-1ubuntu1~22.04) ...
update-alternatives: using /usr/lib/jvm/java-11-openjdk-amd64/bin/jconsole to provide /usr/bin/jconsole (jconsole) in
Setting up libjlatexmath-java (1.0.7-3) ...
Setting up libxkbfile1:amd64 (1:1.1.0-1build3) ...
Setting up libxerces2-java (2.12.1-1) ...
Setting up libjaxp1.3-java (1.3.05-6) ...
Setting up junit4 (4.13.2-1) ...
Setting up jarwrapper (0.78) ...
Setting up libcommons-parent-java (43-1) ...
Setting up libcommons-logging-java (1.2-2) ...
Setting up default-jdk (2:1.11-72build2) ...
Setting up libxalan2-java (2.7.2-4) ...
Setting up x11-utils (7.7+5build2) ...
Setting up libatk-wrapper-java (0.38.0-5build1) ...
Setting up libcommons-io-java (2.11.0-2) ...
Setting up libxmlgraphics-commons-java (2.6-1) ...
Setting up libatk-wrapper-java-jni:amd64 (0.38.0-5build1) ...
Setting up libbatik-java (1.14-1ubuntu0.2) ...
Setting up ditaa (0.10+ds1-1.2) ...
Setting up libfop-java (1:2.6-2) ...
Setting up plantuml (1:1.2020.2+ds-1) ...
Processing triggers for hicolor-icon-theme (0.17-2) ...
Processing triggers for libc-bin (2.35-0ubuntu3.8) ...

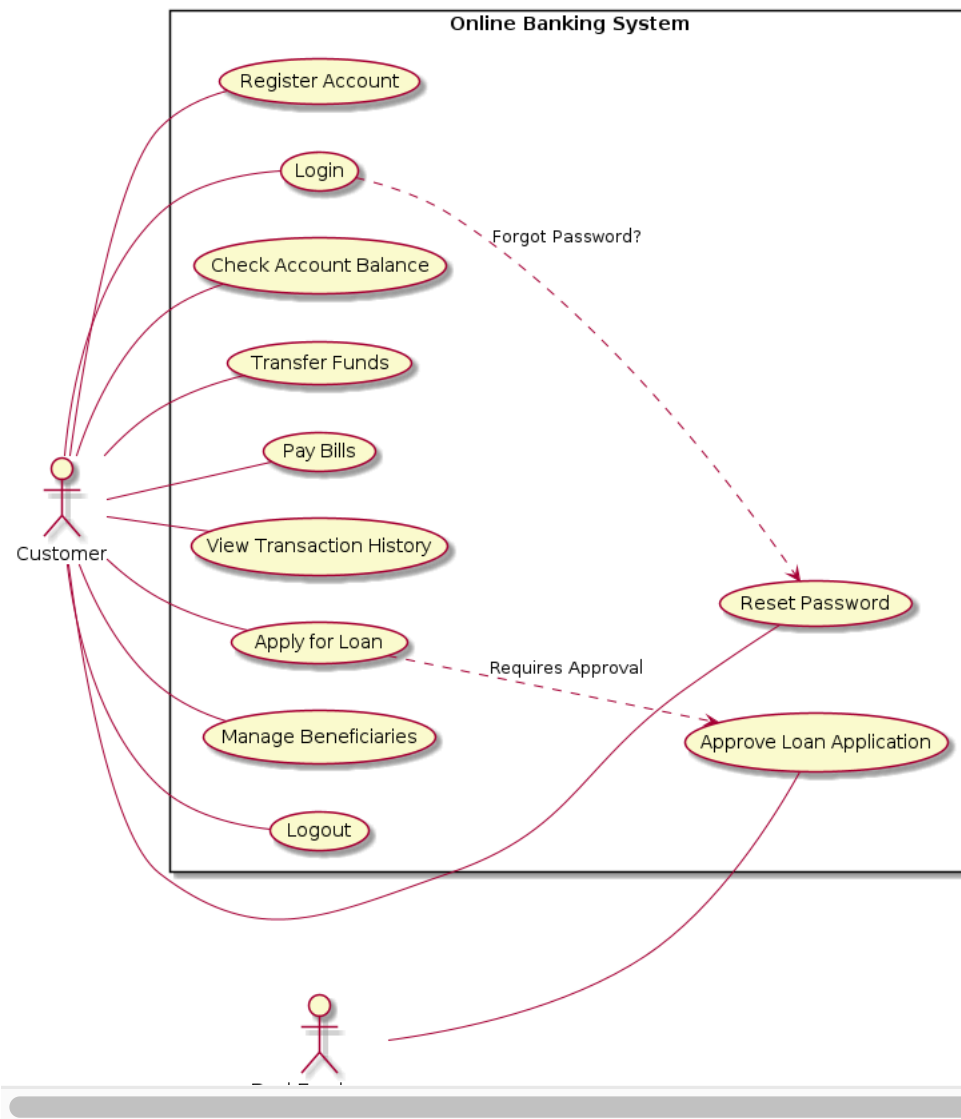
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/sbin/ldconfig.real: /usr/local/lib/libtbbbind_2_0.so.3 is not a symbolic link
/sbin/ldconfig.real: /usr/local/lib/libtbb.so.12 is not a symbolic link
/sbin/ldconfig.real: /usr/local/lib/libur_loader.so.0 is not a symbolic link
/sbin/ldconfig.real: /usr/local/lib/libumf.so.0 is not a symbolic link
/sbin/ldconfig.real: /usr/local/lib/libtbbmalloc.so.2 is not a symbolic link
/sbin/ldconfig.real: /usr/local/lib/libhwloc.so.15 is not a symbolic link
/sbin/ldconfig.real: /usr/local/lib/libtcm.so.1 is not a symbolic link
/sbin/ldconfig.real: /usr/local/lib/libur_adapter_level_zero.so.0 is not a symbolic link
/sbin/ldconfig.real: /usr/local/lib/libtbbmalloc_proxy.so.2 is not a symbolic link
/sbin/ldconfig.real: /usr/local/lib/libtbbbind.so.3 is not a symbolic link
/sbin/ldconfig.real: /usr/local/lib/libtcm_debug.so.1 is not a symbolic link
/sbin/ldconfig.real: /usr/local/lib/libur_adapter_opencl.so.0 is not a symbolic link
/sbin/ldconfig.real: /usr/local/lib/libtbbbind_2_5.so.3 is not a symbolic link

Processing triggers for man-db (2.10.2-1) ...
Processing triggers for mailcap (3.70+nmu1ubuntu1) ...
Processing triggers for fontconfig (2.13.1-4.2ubuntu5) ...

```



```
!apt-get install -y plantuml
```

```
uml_code = """
@startuml
class Customer {
    +registerAccount()
    +login()
    +checkBalance()
    +transferFunds()
    +payBills()
    +viewTransactionHistory()
    +applyForLoan()
    +manageBeneficiaries()
    +logout()
    +resetPassword()
}

class BankEmployee {
    +approveLoanApplication()
}

class Account {
    -accountNumber
    -balance
    +getBalance()
    +updateBalance()
}

class Transaction {
    -transactionId
    -amount
    -date
    +getTransactionDetails()
}

class Loan {
    -loanId
    -amount
    -interestRate
    -status
    +applyLoan()
    +getLoanDetails()
    +calculateEMI()
}

class Notification {
    -message
    +sendEmail()
    +sendSMS()
}

Customer --> Account
Customer --> Transaction
Customer --> Loan
BankEmployee --> Loan : "approves"
Loan --> Notification : "sends status update"
Transaction --> Notification : "sends receipt"
@enduml
"""
```

```
uml_file_path = "/content/diagram.puml"
with open(uml_file_path, "w") as file:
    file.write(uml_code)
```

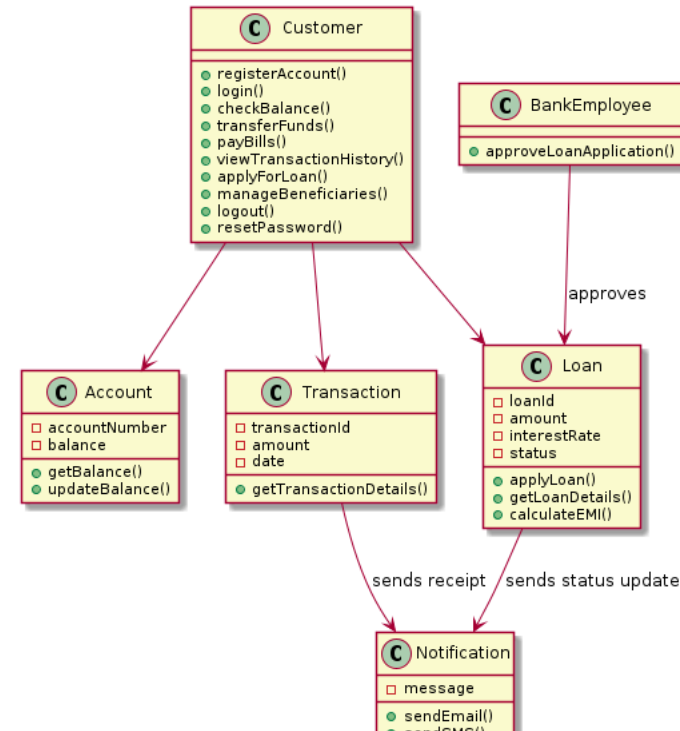
```
os.system(f"plantuml {uml_file_path}")
```

```
from IPython.display import Image
Image(filename="/content/diagram.png")
```

```

➦ Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
plantuml is already the newest version (1:1.2020.2+ds-1).
0 upgraded, 0 newly installed, 0 to remove and 29 not upgraded.

```



```
!apt-get install -y plantuml
```

```

uml_code = """
@startuml
actor Customer
participant "Online Banking System" as OBS
participant Account
participant Transaction
participant Loan
participant BankEmployee
participant Notification

Customer -> OBS: login()
OBS -> Account: verifyCredentials()
Account -> OBS: authenticationSuccess()
OBS -> Customer: loginSuccess()

Customer -> OBS: checkBalance()
OBS -> Account: getBalance()
Account -> OBS: returnBalance()
OBS -> Customer: displayBalance()

Customer -> OBS: transferFunds()
OBS -> Transaction: initiateTransfer()
Transaction -> Account: updateBalance()
Account -> Transaction: confirmTransaction()
Transaction -> OBS: transactionSuccess()
OBS -> Notification: sendSMS()
Notification -> Customer: transferReceipt()

Customer -> OBS: applyForLoan()
OBS -> Loan: processLoanApplication()
Loan -> BankEmployee: requestApproval()
BankEmployee -> Loan: approveLoan()
Loan -> OBS: loanApproved()
OBS -> Notification: sendEmail()
Notification -> Customer: loanStatus()

Customer -> OBS: logout()
OBS -> Customer: logoutSuccess()
@enduml
"""

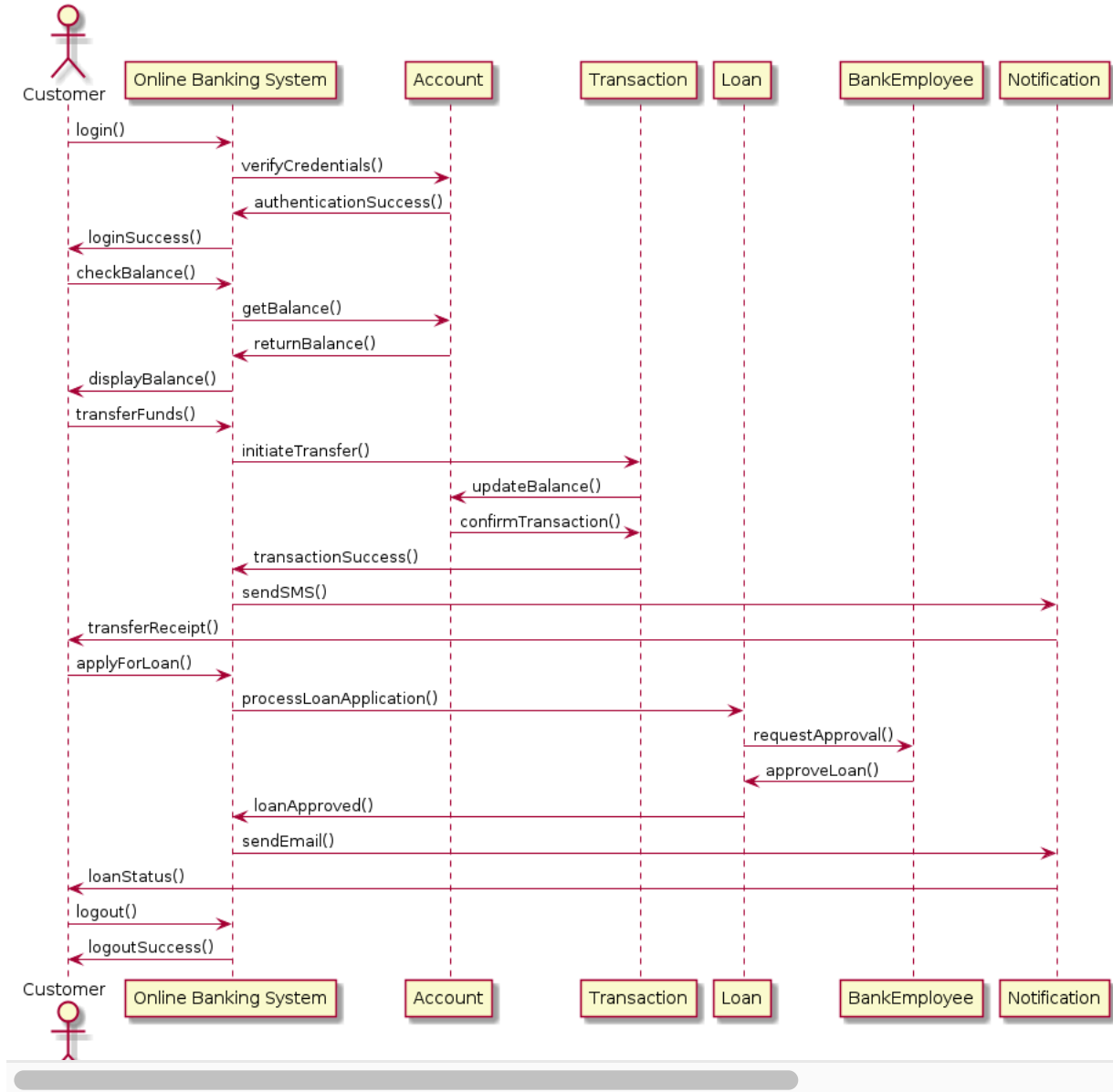
```

```
uml_file_path = "/content/sequence_diagram.puml"
with open(uml_file_path, "w") as file:
    file.write(uml_code)
```

```
os.system(f"plantuml {uml_file_path}")
```

```
from IPython.display import Image
Image(filename="/content/sequence_diagram.png")
```

```
➦ Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
plantuml is already the newest version (1:1.2020.2+ds-1).
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```



```
!apt-get install -y plantuml
```

```
uml_code = ""
@startuml
start
:User Opens Online Banking Portal;
:Enter Credentials;
if (Are Credentials Valid?) then (Yes)
:Display Dashboard;
repeat
:Choose an Action;
switch (Selected Action)
case (Check Balance)
:Retrieve Account Balance;
:Display Balance;
end
end
end
```



```

        case (Transfer Funds)
            :Enter Transfer Details;
            if (Is Transfer Valid?) then (Yes)
                :Process Transfer;
                :Send SMS Notification;
                :Transfer Successful;
            else (No)
                :Show Error Message;
            endif
        case (Apply for Loan)
            :Submit Loan Application;
            if (Loan Approved?) then (Yes)
                :Approve Loan;
                :Send Email Notification;
                :Notify User;
            else (No)
                :Reject Loan;
                :Notify User;
            endif
        case (Reset Password)
            :User Requests Password Reset;
            :Send Reset Email;
            :User Enters New Password;
            :Password Updated;
        endswitch
    repeat while (User Wants Another Action?)

        :Logout;
        :End Session;
    else (No)
        :Show Login Error;
    endif
    stop
@enduml
"""

```

```

uml_file_path = "/content/activity_diagram.puml"
with open(uml_file_path, "w") as file:
    file.write(uml_code)

```

```
os.system(f"plantuml {uml_file_path}")
```

```

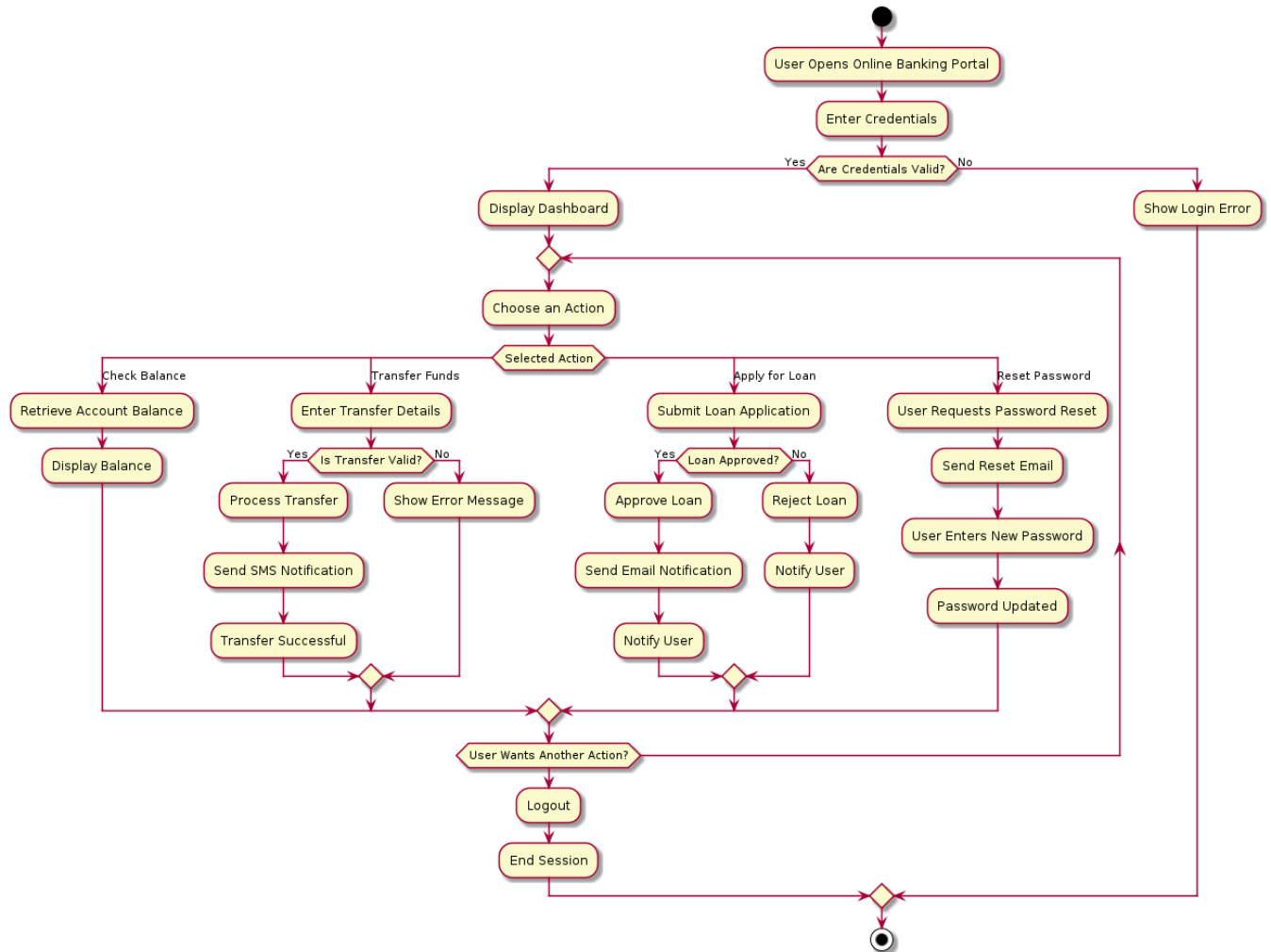
from IPython.display import Image
Image(filename="/content/activity_diagram.png")

```

```

Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
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```



```
!apt-get install -y plantuml
```

```

uml_code = ""
@startuml
component "User Interface" as UI
component "Authentication Service" as Auth
component "Banking Services" as Banking
component "Transaction Service" as Transaction
component "Loan Processing" as Loan
component "Notification Service" as Notify
component "Database" as DB

UI --> Auth : User Login
Auth --> DB : Verify Credentials
Auth --> UI : Authentication Success/Failure
UI --> Banking : Request Account Info
Banking --> DB : Fetch Account Details
Banking --> UI : Display Account Details
UI --> Transaction : Transfer Funds
Transaction --> Banking : Validate Funds
Transaction --> DB : Update Account Balance
Transaction --> Notify : Send Transaction Alert
Transaction --> UI : Show Transaction Status
UI --> Loan : Apply for Loan

```

```

Loan --> Banking : Check Eligibility
Loan --> DB : Store Loan Request
Loan --> Notify : Send Loan Status Update
Loan --> UI : Loan Approval/Rejection
@enduml
"""

```

```

uml_file_path = "/content/component_diagram.puml"
with open(uml_file_path, "w") as file:
    file.write(uml_code)

```

```
os.system(f"plantuml {uml_file_path}")
```

```

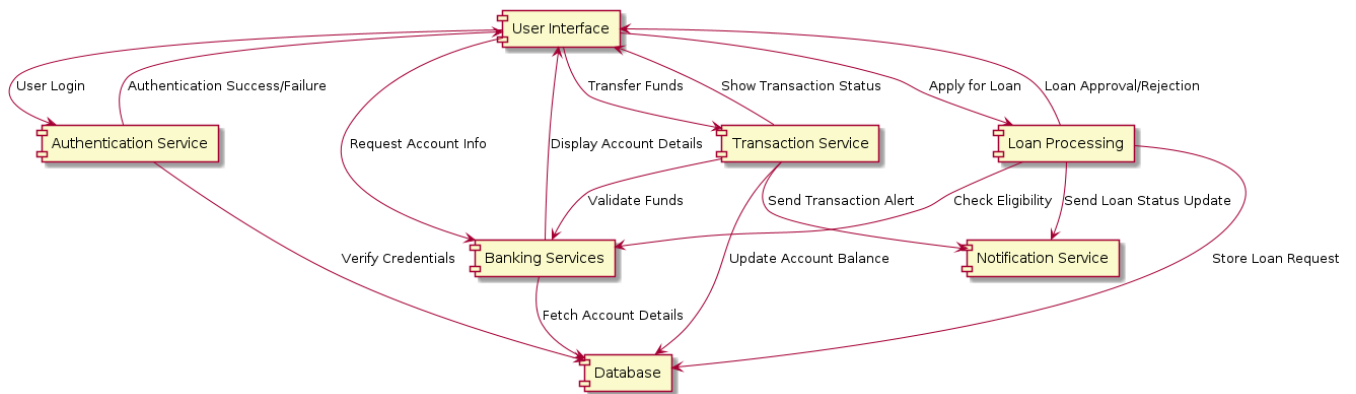
from IPython.display import Image
Image(filename="/content/component_diagram.png")

```

```

🔄 Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
plantuml is already the newest version (1:1.2020.2+ds-1).
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```



```
!apt-get install -y plantuml
```

```

uml_code = """
@startuml
node "User Device" {
    component "Web Browser" as Browser
}

node "Bank Server" {
    component "Web Server" as WebServer
    component "Application Server" as AppServer
    database "Banking Database" as DB
    component "Notification Service" as Notify
}

```

```

Browser --> WebServer : HTTP Request (Login, Transactions)
WebServer --> AppServer : Process Request
AppServer --> DB : Fetch/Update Data
DB --> AppServer : Send Response
AppServer --> Notify : Send Email/SMS Alerts
AppServer --> WebServer : Send Processed Data
WebServer --> Browser : Display Result
@enduml
"""

```

```

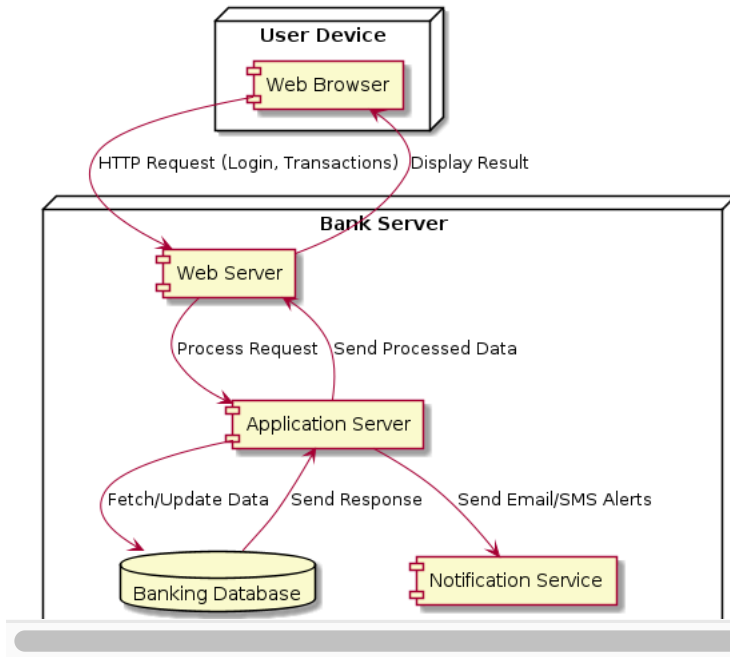
uml_file_path = "/content/component_with_nodes_diagram.puml"
with open(uml_file_path, "w") as file:
    file.write(uml_code)

```

```
os.system(f"plantuml {uml_file_path}")
```

```
from IPython.display import Image
Image(filename="/content/component_with_nodes_diagram.png")
```

```
↻ Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
plantuml is already the newest version (1:1.2020.2+ds-1).
0 upgraded, 0 newly installed, 0 to remove and 29 not upgraded.
```



```
!apt-get install -y plantuml
```

```
uml_code = """
@startuml
[*] --> Idle
Idle --> LoggingIn : Enter Credentials
LoggingIn --> LoggedIn : Authentication Successful
LoggingIn --> Blocked : Too Many Failed Attempts
Blocked --> Idle : Reset Password
LoggedIn --> CheckingBalance : Check Balance
CheckingBalance --> LoggedIn : Balance Displayed
LoggedIn --> TransferringFunds : Transfer Funds
TransferringFunds --> TransactionCompleted : Transfer Successful
TransferringFunds --> LoggedIn : Transfer Failed
LoggedIn --> ApplyingForLoan : Apply for Loan
ApplyingForLoan --> LoanProcessing : Processing Loan
LoanProcessing --> LoanApproved : Loan Approved
LoanProcessing --> LoanRejected : Loan Rejected
LoanApproved --> LoggedIn
LoanRejected --> LoggedIn
TransactionCompleted --> LoggedIn
LoggedIn --> UpdatingProfile : Update Profile
UpdatingProfile --> LoggedIn : Profile Updated
LoggedIn --> LoggingOut : Logout Request
LoggingOut --> Idle : Session Ended
@enduml
"""
```

```
uml_file_path = "/content/state_diagram.puml"
with open(uml_file_path, "w") as file:
    file.write(uml_code)
```

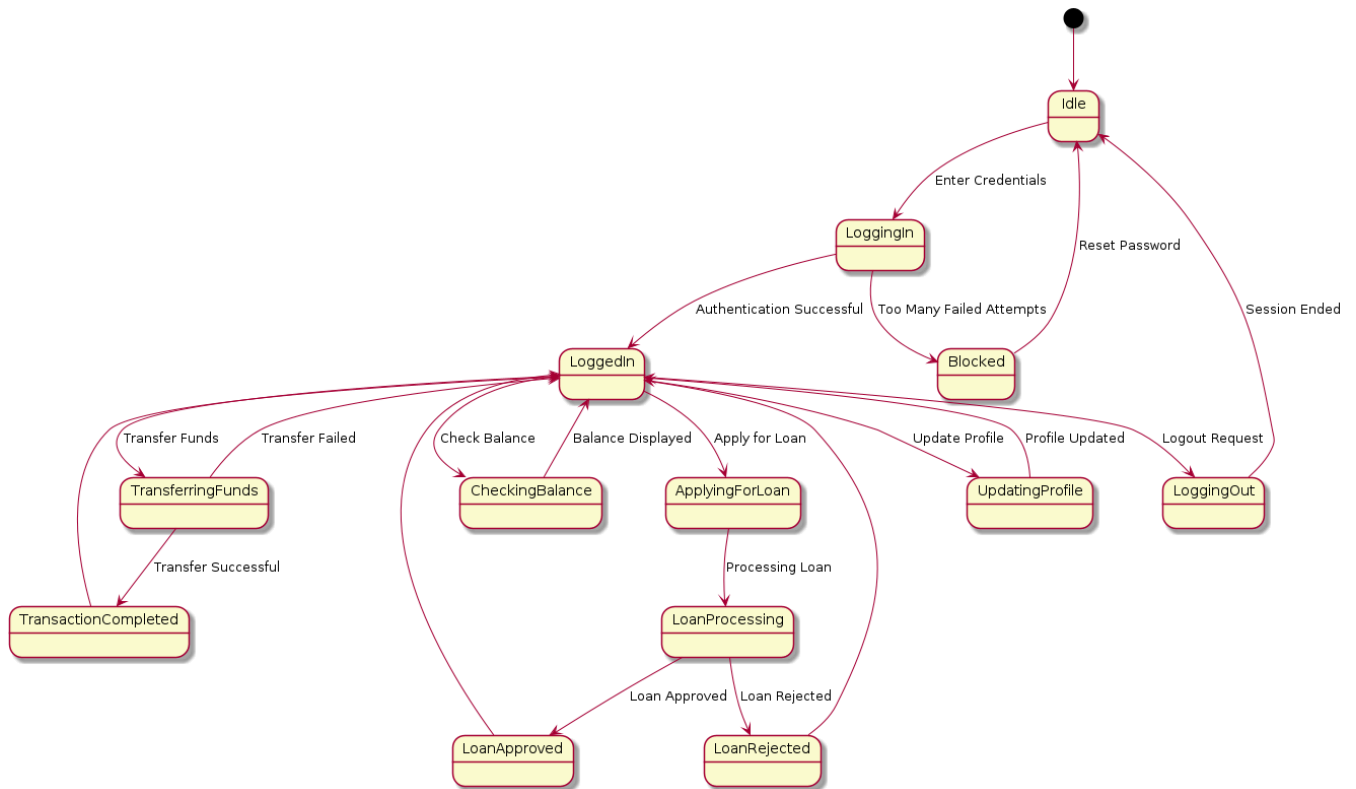
```
os.system(f"plantuml {uml_file_path}")
```

```
from IPython.display import Image
Image(filename="/content/state_diagram.png")
```

```

🔗 Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
plantuml is already the newest version (1:1.2020.2+ds-1).
0 upgraded, 0 newly installed, 0 to remove and 29 not upgraded.

```



```
!apt-get install -y plantuml
```

```

uml_code = ""
@startuml
title Collaboration Diagram for Online Banking System

object Customer
object OnlineBankingSystem
object Account
object Transaction
object Loan
object BankEmployee
object Notification

' User login process
Customer -down-> OnlineBankingSystem : (1) login()
OnlineBankingSystem -down-> Account : (2) verifyCredentials()
Account -down-> OnlineBankingSystem : (3) authenticationSuccess()
OnlineBankingSystem -down-> Customer : (4) loginSuccess()
OnlineBankingSystem -down-> Customer : (5) loginFailed()
Customer -down-> OnlineBankingSystem : (6) resetPassword()

' Checking balance
Customer -down-> OnlineBankingSystem : (7) checkBalance()
OnlineBankingSystem -down-> Account : (8) getBalance()
Account -down-> OnlineBankingSystem : (9) returnBalance()
OnlineBankingSystem -down-> Customer : (10) displayBalance()

```