

the microservices repository that you created in CodeCommit as the *remote origin* of this Git repository area on your IDE. Finally, you *pushed* the changes that were committed in the *dev* branch to the remote origin.

```

1 -----BEGIN RSA PRIVATE KEY-----
2 MTEpQjBAAQCAgE9TksPwgRwCgkIgl702+eGVrcitLafqB0Hm67tG1Gm2z
3 xwFwBfHog0jw1wZ5JNKhkpdiQj0316cTC/eHNQX5gSRf+7dENBrgptC0v0q
4 JxPL18UJM+YohpZ8zegP0oU13r7u8qphbK8S/x+ke7jCDArzJ288+5x2h
5 xwFwBfHog0jw1wZ5JNKhkpdiQj0316cTC/eHNQX5gSRf+7dENBrgptC0v0q
6 9o=U/YzorUvgx3b6mVvcJpMCJCH14juEsN6Vt1VmVcv23x0uVy
7 rnb1w+SPzLm0dGm0x1SmugWrc81+b0vXmdu2aoyVwFjsDmcXxx/bwMjy
8 o9+jYvQ115G2Q0Q1n79n0laVhYmcbt6Q0JQ325ASykyLlPx0xb0+b7jHqa
9 v+YhRvq115G2Q0Q1n79n0laVhYmcbt6Q0JQ325ASykyLlPx0xb0+b7jHqa
10 lMa1jQx/CPLA6a1415+0118n/L1621stalwX7g/cTcqpOutFnhtX0en2nsy
11 p3XL1G10K7NSFFQwQm9s+rQHlxq0PPE+c7Ja41+b6rEx1kARYL/_AgE+7E
12 Tzr11kcpPLA6a1415+0118n/L1621stalwX7g/cTcqpOutFnhtX0en2nsy
13 A4176lnAbdGm0x1SmugWrc81+b0vXmdu2aoyVwFjsDmcXxx/bwMjy
14 +J3Wekq11xgTrnuqjMDRSyqat5PhKwz/yhfkx+y+2bPfmhbluity3fing
15 1u69phb1jTeV17M51MaAt9cHM4B0JLk5wz79yN55x7fz/k1Ag0BA0vG
16 2893M9895jM+YohpZ8zegP0oU13r7u8qphbK8S/x+ke7jCDArzJ288+5x2h
17 5226090975JM+YohpZ8zegP0oU13r7u8qphbK8S/x+ke7jCDArzJ288+5x2h
18 CsTgldfTNEBdevoU1jwKm3gcbMg8u8ycrgloGAYapLChGgdpHn9eVvG
19 B5ta72s1p57fG0rtoOvwv.je5g8k8XPrn3PvgvVousoXuc1v60n+mPy7b3KH
20 o9+jYvQ115G2Q0Q1n79n0laVhYmcbt6Q0JQ325ASykyLlPx0xb0+b7jHqa
21 Tzr11kcpPLA6a1415+0118n/L1621stalwX7g/cTcqpOutFnhtX0en2nsy
22 Bus4VdkRhloBpu8p0Yhcm51gsYwzQh0/SdQ4H08+sd652g9Qn+kYpmfssAvC/J
23 h4QAMwGvApkPT5v38XXCH4F52zJx3o/Cagpey3ox3Y/w1Bk+2nHv9i9QL
25 Mb4B0vVvsoKRp9uK7ynKXH18+3h1m807strnAJD1WvqBvAvdgvG
27 -----END RSA PRIVATE KEY-----

```

bash - ip-10-16-10-153.x | Immediate (Javascript (br x)

veclabs:~/environment/customer \$ cd ~/environment/microservices  
veclabs:~/environment/microservices \$ |

```

1 -----BEGIN RSA PRIVATE KEY-----
2 MTEpQjBAAQCAgE9TksPwgRwCgkIgl702+eGVrcitLafqB0Hm67tG1Gm2z
3 xwFwBfHog0jw1wZ5JNKhkpdiQj0316cTC/eHNQX5gSRf+7dENBrgptC0v0q
4 JxPL18UJM+YohpZ8zegP0oU13r7u8qphbK8S/x+ke7jCDArzJ288+5x2h
5 xwFwBfHog0jw1wZ5JNKhkpdiQj0316cTC/eHNQX5gSRf+7dENBrgptC0v0q
6 9o=U/YzorUvgx3b6mVvcJpMCJCH14juEsN6Vt1VmVcv23x0uVy
7 rnb1w+SPzLm0dGm0x1SmugWrc81+b0vXmdu2aoyVwFjsDmcXxx/bwMjy
8 o9+jYvQ115G2Q0Q1n79n0laVhYmcbt6Q0JQ325ASykyLlPx0xb0+b7jHqa
9 v+YhRvq115G2Q0Q1n79n0laVhYmcbt6Q0JQ325ASykyLlPx0xb0+b7jHqa
10 lMa1jQx/CPLA6a1415+0118n/L1621stalwX7g/cTcqpOutFnhtX0en2nsy
11 p3XL1G10K7NSFFQwQm9s+rQHlxq0PPE+c7Ja41+b6rEx1kARYL/_AgE+7E
12 Tzr11kcpPLA6a1415+0118n/L1621stalwX7g/cTcqpOutFnhtX0en2nsy
13 A4176lnAbdGm0x1SmugWrc81+b0vXmdu2aoyVwFjsDmcXxx/bwMjy
14 +J3Wekq11xgTrnuqjMDRSyqat5PhKwz/yhfkx+y+2bPfmhbluity3fing
15 1u69phb1jTeV17M51MaAt9cHM4B0JLk5wz79yN55x7fz/k1Ag0BA0vG
16 2893M9895jM+YohpZ8zegP0oU13r7u8qphbK8S/x+ke7jCDArzJ288+5x2h
17 5226090975JM+YohpZ8zegP0oU13r7u8qphbK8S/x+ke7jCDArzJ288+5x2h
18 CsTgldfTNEBdevoU1jwKm3gcbMg8u8ycrgloGAYapLChGgdpHn9eVvG
19 B5ta72s1p57fG0rtoOvwv.je5g8k8XPrn3PvgvVousoXuc1v60n+mPy7b3KH
20 o9+jYvQ115G2Q0Q1n79n0laVhYmcbt6Q0JQ325ASykyLlPx0xb0+b7jHqa
21 Tzr11kcpPLA6a1415+0118n/L1621stalwX7g/cTcqpOutFnhtX0en2nsy
22 Bus4VdkRhloBpu8p0Yhcm51gsYwzQh0/SdQ4H08+sd652g9Qn+kYpmfssAvC/J
23 h4QAMwGvApkPT5v38XXCH4F52zJx3o/Cagpey3ox3Y/w1Bk+2nHv9i9QL
27 -----END RSA PRIVATE KEY-----

```

bash - ip-10-16-10-153.x | Immediate (Javascript (br x)

veclabs:~/environment/customer \$ cd ~/environment/microservices  
veclabs:~/environment/microservices \$ git init  
hint: switching 'master' as the name for the initial branch. This default branch name  
hint: is subject to change. To configure the initial branch name to use in all  
hint: of your new repositories, which will suppress this warning, call:  
hint:  
hint: git config --global init.defaultBranch <name>  
hint:  
hint: Names commonly chosen instead of 'master' are 'main', 'trunk' and  
hint: 'development'. The just-created branch can be renamed via this command:  
hint:  
hint: git branch -m <name>  
Initialized empty Git repository in /home/ec2-user/environment/microservices/.git/  
veclabs:~/environment/microservices (master) \$ |

```

1 -----BEGIN RSA PRIVATE KEY-----
2 MTEpQjBAAQCAgE9TksPwgRwCgkIgl702+eGVrcitLafqB0Hm67tG1Gm2z
3 xwFwBfHog0jw1wZ5JNKhkpdiQj0316cTC/eHNQX5gSRf+7dENBrgptC0v0q
4 JxPL18UJM+YohpZ8zegP0oU13r7u8qphbK8S/x+ke7jCDArzJ288+5x2h
5 xwFwBfHog0jw1wZ5JNKhkpdiQj0316cTC/eHNQX5gSRf+7dENBrgptC0v0q
6 9o=U/YzorUvgx3b6mVvcJpMCJCH14juEsN6Vt1VmVcv23x0uVy
7 rnb1w+SPzLm0dGm0x1SmugWrc81+b0vXmdu2aoyVwFjsDmcXxx/bwMjy
8 o9+jYvQ115G2Q0Q1n79n0laVhYmcbt6Q0JQ325ASykyLlPx0xb0+b7jHqa
9 v+YhRvq115G2Q0Q1n79n0laVhYmcbt6Q0JQ325ASykyLlPx0xb0+b7jHqa
10 lMa1jQx/CPLA6a1415+0118n/L1621stalwX7g/cTcqpOutFnhtX0en2nsy
11 p3XL1G10K7NSFFQwQm9s+rQHlxq0PPE+c7Ja41+b6rEx1kARYL/_AgE+7E
12 Tzr11kcpPLA6a1415+0118n/L1621stalwX7g/cTcqpOutFnhtX0en2nsy
13 A4176lnAbdGm0x1SmugWrc81+b0vXmdu2aoyVwFjsDmcXxx/bwMjy
14 +J3Wekq11xgTrnuqjMDRSyqat5PhKwz/yhfkx+y+2bPfmhbluity3fing
15 1u69phb1jTeV17M51MaAt9cHM4B0JLk5wz79yN55x7fz/k1Ag0BA0vG
16 2893M9895jM+YohpZ8zegP0oU13r7u8qphbK8S/x+ke7jCDArzJ288+5x2h
17 5226090975JM+YohpZ8zegP0oU13r7u8qphbK8S/x+ke7jCDArzJ288+5x2h
18 CsTgldfTNEBdevoU1jwKm3gcbMg8u8ycrgloGAYapLChGgdpHn9eVvG
19 B5ta72s1p57fG0rtoOvwv.je5g8k8XPrn3PvgvVousoXuc1v60n+mPy7b3KH
20 o9+jYvQ115G2Q0Q1n79n0laVhYmcbt6Q0JQ325ASykyLlPx0xb0+b7jHqa
21 Tzr11kcpPLA6a1415+0118n/L1621stalwX7g/cTcqpOutFnhtX0en2nsy
22 Bus4VdkRhloBpu8p0Yhcm51gsYwzQh0/SdQ4H08+sd652g9Qn+kYpmfssAvC/J
23 h4QAMwGvApkPT5v38XXCH4F52zJx3o/Cagpey3ox3Y/w1Bk+2nHv9i9QL
27 -----END RSA PRIVATE KEY-----

```

bash - ip-10-16-10-153.x | Immediate (Javascript (br x)

hint: Using 'master' as the name for the initial branch. This default branch name  
hint: is subject to change. To configure the initial branch name to use in all  
hint: of your new repositories, which will suppress this warning, call:  
hint:  
hint: git config --global init.defaultBranch <name>  
hint:  
hint: Names commonly chosen instead of 'master' are 'main', 'trunk' and  
hint: 'development'. The just-created branch can be renamed via this command:  
hint:  
hint: git branch -m <name>  
Initialized empty Git repository in /home/ec2-user/environment/microservices/.git/  
veclabs:~/environment/microservices (master) \$ git checkout -b dev  
Switched to a new branch 'dev'  
veclabs:~/environment/microservices (dev) \$ |

File Edit Find View Go Run Tools Window Support Preview Run

Go Anything (Ctrl-P)

```
-----BEGIN RSA PRIVATE KEY-----
MIIEpQBAAKCAQEA0jTksNgMwsJejq4702+eGVfnztifgR0ZINm6t6Iw+2
PrvG1bw1048CjdpoYy/D010thJ1d0B2u0d0Xg1pxVwvd0J1CcqvRPInPik
4JxPL1BUjYohqr28zegPooE13r7duqubhR3/xkce7z/CDrhZj8bs+sK2H
xvAFWbbFhQoB0lje25JN0Rkpdk1kD316cFTC/eFN0KsSrf+eDlbpptC0Oq
9cU/Tz0vrdLgK3bem6R8VvcfJPMECJRH14ju1Es1N6VtV1vnNCv23Kq0Vy
nTbHj7o1iy1u0d0f8/81mR2l0g1bSNk092uA0DQAQcUrggQyMbbR8
zsm1p5PzyMu0h3E/ad1J11402+ft8e5nyypd1z1Pxv0+Pv7b3KH
9vYh1k1Qx/PXLAdaaG14t0118d/L1621stahw2Vg/tcf4pOutFnhtbXb2h8y
p1X1G16K0K7NSFFBQsM9srfQH1ixy0x0PE+c71a41sbeX1RaRYX/_MgEr7E
vYtAtq1ynhUf1x11Ub1wLw+29H6170/yDQz/cQvBd6f8n/ps5FgjzGV
A+U76h1Aqk1Lw+29H6170/yDQz/cQvBd6f8n/ps5FgjzGV
+13Meek1Lw+29H6170/yDQz/cQvBd6f8n/ps5FgjzGV
1u69phb1Lr1ev1M451MaAt9cNA4BB3Uk5Kwoz9yMNSxkFz/k1Ao6BA0
B9:0W90950fpfle0J6eE6K4/tMwVzj+nRt19eONC1J1J0gPd010FHE7eWVBC7d
52Sh620m075/H114utAcB6c2z/JATN1atrcBuF94lw/u770K00A010
9vYh1k1Qx/PXLAdaaG14t0118d/L1621stahw2Vg/tcf4pOutFnhtbXb2h8y
B9Itaz2l1p7x746f7coQKewy+s5p8K8XVfrn3PsvyKmoaXuc1v6q3nPP7b3KH
9wJYtVs51x10LShy5uPdNSAGoHedr/o/jecATr3NmpgAbly7h1x0cGouA
k2d0T1LDQyEmWt7zQ9YEcYEtAtNeXK0765dnfSw6v8yk15Lwzj0TQE1tH
Tz11kqgP2Pf4+k0uNCBLbrncHLsBvIn7w9hpd0uLgd1HwB1tggs3Ld0p
23V4d0k1Lw+29H6170/yDQz/cQvBd6f8n/ps5FgjzGV
-----END RSA PRIVATE KEY-----
```

bash -\*ip-10-10-10-153.x\* | Immediate (Javascript (br x))

hint: is subject to change. To configure the initial branch name to use in all hint: of your new repositories, which will suppress this warning, call:

hint: git config --global init.defaultBranch <name>

hint: Names commonly chosen instead of 'master' are 'main', 'trunk' and 'development'. The just-created branch can be renamed via this command:

hint: git branch -m <name>

Initialized empty Git repository in /home/ec2-user/environment/microservices/.git/

veclabs:/environment/microservices (master) \$ git checkout -b dev

Switched to a new branch 'dev'

veclabs:/environment/microservices (dev) \$ git branch -m dev

veclabs:/environment/microservices (dev) \$ |

27.30 Text Spaces: 4

File Edit Find View Go Run Tools Window Support Preview Run

Go Anything (Ctrl-P)

```
-----BEGIN RSA PRIVATE KEY-----
MIIEpQBAAKCAQEA0jTksNgMwsJejq4702+eGVfnztifgR0ZINm6t6Iw+2
PrvG1bw1048CjdpoYy/D010thJ1d0B2u0d0Xg1pxVwvd0J1CcqvRPInPik
4JxPL1BUjYohqr28zegPooE13r7duqubhR3/xkce7z/CDrhZj8bs+sK2H
xvAFWbbFhQoB0lje25JN0Rkpdk1kD316cFTC/eFN0KsSrf+eDlbpptC0Oq
9cU/Tz0vrdLgK3bem6R8VvcfJPMECJRH14ju1Es1N6VtV1vnNCv23Kq0Vy
nTbHj7o1iy1u0d0f8/81mR2l0g1bSNk092uA0DQAQcUrggQyMbbR8
zsm1p5PzyMu0h3E/ad1J11402+ft8e5nyypd1z1Pxv0+Pv7b3KH
9vYh1k1Qx/PXLAdaaG14t0118d/L1621stahw2Vg/tcf4pOutFnhtbXb2h8y
p1X1G16K0K7NSFFBQsM9srfQH1ixy0x0PE+c71a41sbeX1RaRYX/_MgEr7E
vYtAtq1ynhUf1x11Ub1wLw+29H6170/yDQz/cQvBd6f8n/ps5FgjzGV
A+U76h1Aqk1Lw+29H6170/yDQz/cQvBd6f8n/ps5FgjzGV
+13Meek1Lw+29H6170/yDQz/cQvBd6f8n/ps5FgjzGV
1u69phb1Lr1ev1M451MaAt9cNA4BB3Uk5Kwoz9yMNSxkFz/k1Ao6BA0
B9:0W90950fpfle0J6eE6K4/tMwVzj+nRt19eONC1J1J0gPd010FHE7eWVBC7d
52Sh620m075/H114utAcB6c2z/JATN1atrcBuF94lw/u770K00A010
9vYh1k1Qx/PXLAdaaG14t0118d/L1621stahw2Vg/tcf4pOutFnhtbXb2h8y
B9Itaz2l1p7x746f7coQKewy+s5p8K8XVfrn3PsvyKmoaXuc1v6q3nPP7b3KH
9wJYtVs51x10LShy5uPdNSAGoHedr/o/jecATr3NmpgAbly7h1x0cGouA
k2d0T1LDQyEmWt7zQ9YEcYEtAtNeXK0765dnfSw6v8yk15Lwzj0TQE1tH
Tz11kqgP2Pf4+k0uNCBLbrncHLsBvIn7w9hpd0uLgd1HwB1tggs3Ld0p
23V4d0k1Lw+29H6170/yDQz/cQvBd6f8n/ps5FgjzGV
-----END RSA PRIVATE KEY-----
```

bash -\*ip-10-10-10-153.x\* | Immediate (Javascript (br x))

veclabs:/environment/customer \$ cd /environment/microservices

veclabs:/environment/microservices \$ git init

hint: Using 'master' as the name for the initial branch. This default branch name  
hint: is subject to change. To configure the initial branch name to use in all  
hint: of your new repositories, which will suppress this warning, call:

hint: git config --global init.defaultBranch <name>

hint: Names commonly chosen instead of 'master' are 'main', 'trunk' and 'development'. The just-created branch can be renamed via this command:

hint: git branch -m <name>

Initialized empty Git repository in /home/ec2-user/environment/microservices/.git/

veclabs:/environment/microservices (master) \$ git checkout -b dev

Switched to a new branch 'dev'

veclabs:/environment/microservices (dev) \$ git branch -m dev

veclabs:/environment/microservices (dev) \$ git add .

veclabs:/environment/microservices (dev) \$ |

27.30 Text Spaces: 4

File Edit Find View Go Run Tools Window Support Preview Run

Go Anything (Ctrl-P)

```
-----BEGIN RSA PRIVATE KEY-----
MIIEpQBAAKCAQEA0jTksNgMwsJejq4702+eGVfnztifgR0ZINm6t6Iw+2
PrvG1bw1048CjdpoYy/D010thJ1d0B2u0d0Xg1pxVwvd0J1CcqvRPInPik
4JxPL1BUjYohqr28zegPooE13r7duqubhR3/xkce7z/CDrhZj8bs+sK2H
xvAFWbbFhQoB0lje25JN0Rkpdk1kD316cFTC/eFN0KsSrf+eDlbpptC0Oq
9cU/Tz0vrdLgK3bem6R8VvcfJPMECJRH14ju1Es1N6VtV1vnNCv23Kq0Vy
nTbHj7o1iy1u0d0f8/81mR2l0g1bSNk092uA0DQAQcUrggQyMbbR8
zsm1p5PzyMu0h3E/ad1J11402+ft8e5nyypd1z1Pxv0+Pv7b3KH
9vYh1k1Qx/PXLAdaaG14t0118d/L1621stahw2Vg/tcf4pOutFnhtbXb2h8y
p1X1G16K0K7NSFFBQsM9srfQH1ixy0x0PE+c71a41sbeX1RaRYX/_MgEr7E
vYtAtq1ynhUf1x11Ub1wLw+29H6170/yDQz/cQvBd6f8n/ps5FgjzGV
A+U76h1Aqk1Lw+29H6170/yDQz/cQvBd6f8n/ps5FgjzGV
+13Meek1Lw+29H6170/yDQz/cQvBd6f8n/ps5FgjzGV
1u69phb1Lr1ev1M451MaAt9cNA4BB3Uk5Kwoz9yMNSxkFz/k1Ao6BA0
B9:0W90950fpfle0J6eE6K4/tMwVzj+nRt19eONC1J1J0gPd010FHE7eWVBC7d
52Sh620m075/H114utAcB6c2z/JATN1atrcBuF94lw/u770K00A010
9vYh1k1Qx/PXLAdaaG14t0118d/L1621stahw2Vg/tcf4pOutFnhtbXb2h8y
B9Itaz2l1p7x746f7coQKewy+s5p8K8XVfrn3PsvyKmoaXuc1v6q3nPP7b3KH
9wJYtVs51x10LShy5uPdNSAGoHedr/o/jecATr3NmpgAbly7h1x0cGouA
k2d0T1LDQyEmWt7zQ9YEcYEtAtNeXK0765dnfSw6v8yk15Lwzj0TQE1tH
Tz11kqgP2Pf4+k0uNCBLbrncHLsBvIn7w9hpd0uLgd1HwB1tggs3Ld0p
23V4d0k1Lw+29H6170/yDQz/cQvBd6f8n/ps5FgjzGV
-----END RSA PRIVATE KEY-----
```

bash -\*ip-10-10-10-153.x\* | Immediate (Javascript (br x))

create mode 100644 employee/views/>00.html

create mode 100644 employee/views/footer.html

create mode 100644 employee/views/header.html

create mode 100644 employee/views/home.html

create mode 100644 employee/views/login.html

create mode 100644 employee/views/supplier-add.html

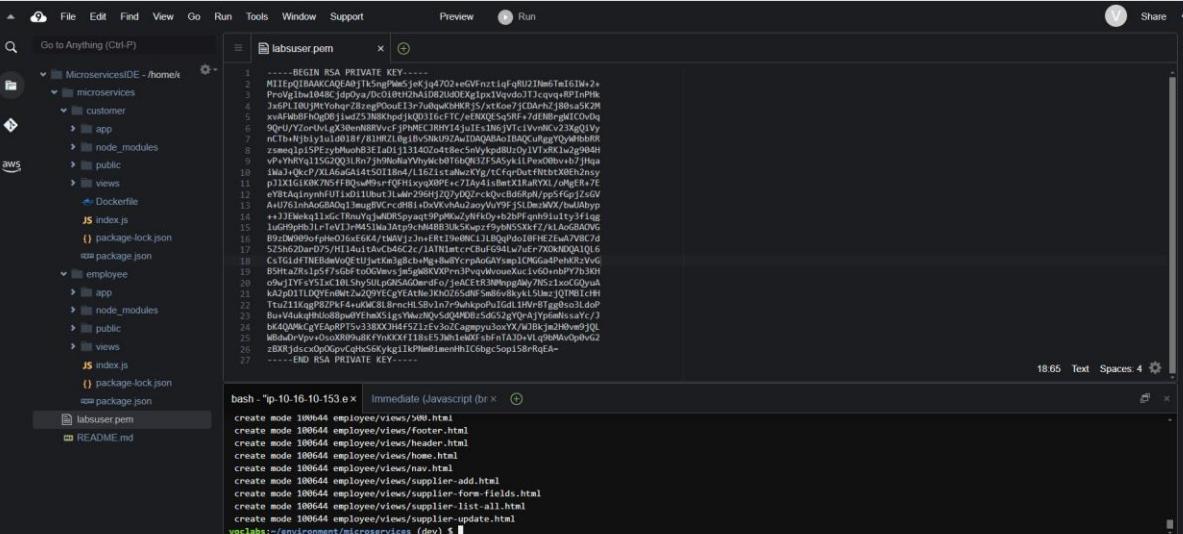
create mode 100644 employee/views/supplier-forms.html

create mode 100644 employee/views/supplier-list-all.html

create mode 100644 employee/views/supplier-update.html

veclabs:/environment/microservices (dev) \$ git commit -m 'two unmodified copies of the application code'

18.65 Text Spaces: 4



```
File Edit Find View Go Run Tools Window Support Preview Run
Go to Anything (Ctrl-P)
└── microservicesIDE - /home/k
    └── microservices
        └── customer
            ├── app
            ├── node_modules
            ├── public
            ├── views
            └── Dockerfile
                └── JS index.js
                └── package-lock.json
                └── package.json
        └── employee
            ├── app
            ├── node_modules
            ├── public
            ├── views
            └── JS index.js
                └── package-lock.json
                └── package.json
    └── labuser.pem
    └── README.md
bash -i -p 10-16-10-153 x | Immediate (Javascript br x +)
create mode 100644 employee/views/home.html
create mode 100644 employee/views/footer.html
create mode 100644 employee/views/header.html
create mode 100644 employee/views/home.html
create mode 100644 employee/views/nav.html
create mode 100644 employee/views/supplier-add.html
create mode 100644 employee/views/supplier-add-fields.html
create mode 100644 employee/views/supplier-first-all.html
create mode 100644 employee/views/supplier-first-all.html
create mode 100644 employee/views/supplier-update.html
vocabs:~/environment/microservices (dev) $
```

The screenshot shows a terminal window and a web browser side-by-side.

**Terminal (Left):**

```
bash -c 'ip -o 10-16-10-53 e' Immediate: Javascript (br x)
create mode 100644 employee/views/header.html
create mode 100644 employee/views/home.html
create mode 100644 employee/views/nav.html
create mode 100644 employee/views/supplier-add.html
create mode 100644 employee/views/supplier-form-fields.html
create mode 100644 employee/views/supplier-list-all.html
create mode 100644 employee/views/supplier-update.html
voclabs:-/environment/microservices (dev) $ git remote add origin https://git-codecommit.us-east-1.amazonaws.com/v1/repos/microservices
origin  (new branch) > dev
Enumerating objects: 100%, (220/220), done.
Counting objects: 100%, (220/220), done.
Delta compression using up to 2 threads
Compressing objects: 100% (209/209), done.
Writing objects: 100% (220/220), 1.94 MiB | 4.38 MiB/s, done.
Total 220 (delta 555), reused 0 (delta 0), pack-reused 0
remote: Validating objects: 100%
To https://git-codecommit.us-east-1.amazonaws.com/v1/repos/microservices
 * [new branch] dev -> dev
branch 'dev' set up to track 'origin/dev'.
voclabs:-/environment/microservices (dev) $
```

**Web Browser (Right):**

The browser is displaying the AWS CodeCommit interface for the 'microservices' repository.

- Header:** Services, Search, N. Virginia, voclabs/user3223197=Gupta,\_Nancy @ 0824-5190-8674
- Left Sidebar:** Developer Tools, CodeCommit, Source, Getting started, Repositories, Code, Pull requests, **Commits**, Branches, Git tags, Settings, Approval rule templates, Artifacts, Build, Deploy, Pipeline, Settings.
- Current View:** Developer Tools > CodeCommit > Repositories > microservices > Commits
- Commits Tab:** Shows a single commit entry:

Commit ID	Commit message	Commit date	Authored date	Author	Committer	Actions
f3143dc2	two unmodified copies of the application code	Just now	Just now	Nancy	Nancy	<a href="#">Copy ID</a> <a href="#">Browse</a>

### **3. Configure your Git client to know your username and email address.**

**Tip:** For information about the commands that you need to use, see [Getting Started - First-Time Git Setup](#).

**Note:** You don't need to use your real name or email address; however, completing this step is an important part of configuring a Git client.

4. In a new browser tab, browse to the CodeCommit console and observe that the code is now checked into your microservices repository.

The screenshot shows the AWS CodeCommit interface. The left sidebar lists various services under 'Developer Tools' and 'CodeCommit'. The main content area shows a list of repositories. A single repository, 'microservices', is listed with its details: Name (microservices), Description (-), Last modified (5 minutes ago), Clone URL (HTTPS and SSH), and AWS KMS Key (arn:aws:kms:us-east-1:082451908674:key/cb78b9cf-6753-41aa-9e4c-eac54ea3156a). Navigation icons for back, forward, and search are visible at the top right.

aWS Services Search [Alt+S] N. Virginia vocabs/user3223197=Gupta,\_Nancy @ 0824-5190-8674

Developer Tools > CodeCommit > Repositories

Repositories Info

C Notify ▾ Clone URL ▾ View repository Delete repository Create repository

Source • CodeCommit

Getting started

Repositories

Approval rule templates

Artifacts • CodeArtifact

Build • CodeBuild

Deploy • CodeDeploy

Pipeline • CodePipeline

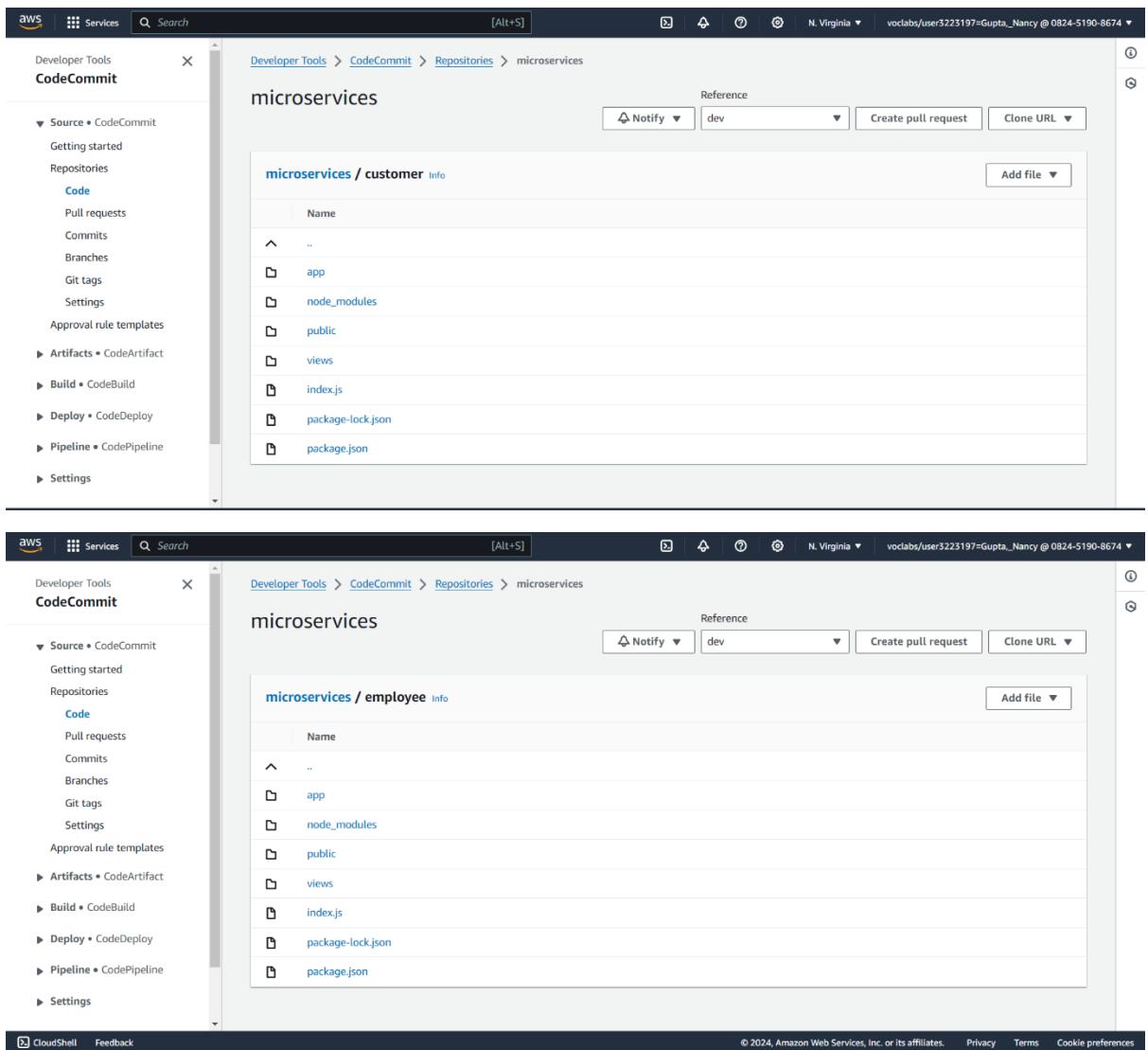
Settings

Go to resource Feedback

Name	Description	Last modified	Clone URL	AWS KMS Key
microservices	-	5 minutes ago	<a href="#">HTTPS</a> <a href="#">SSH</a> <a href="#">HTTPS (GRC)</a>	arn:aws:kms:us-east-1:082451908674:key/cb78b9cf-6753-41aa-9e4c-eac54ea3156a

CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

The screenshot shows the AWS CodeCommit interface. The left sidebar is titled "Developer Tools" and "CodeCommit". It includes sections for "Source" (with "CodeCommit" selected), "Getting started", "Repositories", "Code" (selected), "Pull requests", "Commits", "Branches", "Git tags", and "Settings". Below these are sections for "Approval rule templates", "Artifacts" (with "CodeArtifact" selected), "Build" (with "CodeBuild" selected), "Deploy" (with "CodeDeploy" selected), "Pipeline" (with "CodePipeline" selected), and "Settings". The main content area shows the "microservices" repository. The navigation bar at the top shows "Developer Tools > CodeCommit > Repositories > microservices". The repository name "microservices" is displayed prominently. A "Reference" dropdown is set to "dev". Buttons for "Notify", "Create pull request", and "Clone URL" are visible. The repository listing shows two branches: "customer" and "employee".



## Phase 4: Configuring the application as two microservices and testing them in Docker containers

In this phase, you will modify the two copies of the monolithic application starter code so that the application functionality is implemented as two separate microservices. Then, for initial testing purposes, you will run the containers on the same EC2 instance that hosts the AWS Cloud9 IDE that you are using. You will use this IDE to build the Docker images and launch the Docker containers.

### Task 4.1: Adjust the AWS Cloud9 instance security group settings

**In this phase of the project, you will use the AWS Cloud9 instance as your test environment. You will run Docker containers on the instance to test the microservices that you will create. To be able to access the containers from a browser over the internet, you must open the ports that you will run the containers on.**

1. **Adjust the security group of the AWS Cloud9 EC2 instance to allow inbound network traffic on TCP ports 8080 and 8081.**

The screenshot shows the AWS CloudShell interface with the following details:

- Services** menu is open, showing options like EC2 Dashboard, EC2 Global View, Events, Console-to-Code, Instances, Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Capacity Reservations, and Images.
- Instances** section is selected, showing two instances:
  - Monolithic...**: Instance ID i-0a1861b7fa61ac29, Running, t2.micro, 2/2 checks passed, us-east-1a, ec2-52-207-23-144
  - aws-cloud9-Ml...**: Instance ID i-0cfdf5c889af3b1eb2, Running, t3.small, 2/2 checks passed, us-east-1a, ec2-54-88-55-144
- Details** tab is selected for the second instance, showing the following details:
  - Instance summary**: Instance ID i-0cfdf5c889af3b1eb2 (aws-cloud9-MicroservicesIDE-84d2e6efedab4a0b8214113159ea5acf)
  - Public IPv4 address**: 54.88.53.35 | [open address](#)
  - Private IPv4 addresses**: 10.16.10.153
  - IPv6 address**: -
  - Instance state**: Running
  - Private IP DNS name (IPv4 only)**: ip-10-16-10-153.ec2.internal
- CloudShell** and **Feedback** buttons are at the bottom left.
- Header bar includes a search field, [Alt+S] keyboard shortcut, N. Virginia region, and a user profile (voclabs/user3223197=Gupta\_Nancy @ 0824-5190-8674).

The screenshot shows the AWS CloudWatch Metrics Insights interface. A search bar at the top contains the query: `CloudWatch Metrics Insights Metrics`. Below the search bar is a table titled "Metrics (1/2) Info" with columns: Metric name, Metric namespace, Metric unit, and Metric value. The table shows two rows: one for CloudWatch Metrics Insights Metrics and another for CloudWatch Metrics Insights Metrics. At the bottom of the page, there is a "Metrics Insights" section with a "Metrics Insights" button.

Detailed description: This screenshot shows the AWS Management Console interface. The left sidebar has a tree view with 'Network & Security' expanded, showing 'Security Groups' as the active item. The main content area is titled 'Security Groups (5) Info'. It contains a search bar and a table with the following data:

Name	Security group ID	Security group name	VPC ID	Description
-	<a href="#">sg-0d3dc7a32965ee9fa</a>	c110323a260559816548437t1w0824...	<a href="#">vpc-043e6f0ce741fda03</a>	Enable inbound
DBSecurityGroup	<a href="#">sg-012f4abba21b3b3d8</a>	DBSecurityGroup	<a href="#">vpc-043e6f0ce741fda03</a>	Enable access
-	<a href="#">sg-0ce210fe840097bec</a>	default	<a href="#">vpc-043e6f0ce741fda03</a>	default VPC s
-	<a href="#">sg-0c42ad9444d184dd1</a>	default	<a href="#">vpc-000e564836083dda8</a>	default VPC s
aws-cloud9-Micros...	<a href="#">sg-063baaa137b779b83</a>	aws-cloud9-MicroservicesIDE-84d2e6...	<a href="#">vpc-043e6f0ce741fda03</a>	Security grou

Screenshot of the AWS EC2 Security Groups page showing a list of security groups.

**Security Groups (1/5) [Info](#)**

Name	Security group ID	Security group name	VPC ID	Description
-	sg-0d3dc7a32965ee9fa	c110323a2605598l6548437t1w0824...	vpc-043e6f0ce741fda03	Enable inbound traffic
DBSecurityGroup	sg-012f4abba21b3b3d8	DBSecurityGroup	vpc-043e6f0ce741fda03	Enable access to RDS
-	sg-0ce210fe840097bec	default	vpc-043e6f0ce741fda03	default VPC
-	sg-0c42ad9444d184dd1	default	vpc-000e564836083ddaa8	default VPC
aws-cloud9-MicroservicesIDE-84d2e6efedab4a0b8214113159ea5acf-InstanceSecurityGroup-lOSOqXTZcJhu	sg-063baaa137b779b83	aws-cloud9-MicroservicesIDE-84d2e6...	vpc-043e6f0ce741fda03	Security group for Cloud9

**Details** [Inbound rules](#) [Outbound rules](#) [Tags](#)

Screenshot of the AWS EC2 Security Groups page showing the Inbound rules tab.

**Inbound rules (2)**

Name	Security group rule ID	IP version	Type	Protocol	Port range
-	sgr-008cf4ec2bb788033	IPv4	SSH	TCP	22
-	sgr-04b9cf83d691b0062	IPv4	SSH	TCP	22

Screenshot of the Edit inbound rules page.

### Edit inbound rules [Info](#)

Inbound rules control the incoming traffic that's allowed to reach the instance.

**Inbound rules [Info](#)**

Security group rule ID	Type <a href="#">Info</a>	Protocol <a href="#">Info</a>	Port range	Source <a href="#">Info</a>	Description - optional <a href="#">Info</a>
sgr-008cf4ec2bb788033	SSH	TCP	22	Custom <input type="button" value="▼"/> <input type="text" value="35.172.155.96/27"/> <input type="button" value="X"/>	<input type="button" value="Delete"/>
sgr-04b9cf83d691b0062	SSH	TCP	22	Custom <input type="button" value="▼"/> <input type="text" value="35.172.155.192/27"/> <input type="button" value="X"/>	<input type="button" value="Delete"/>

[Add rule](#)

[Cancel](#) [Preview changes](#) [Save rules](#)

Inbound rules

Security group rule ID	Type	Protocol	Port range	Source	Description - optional
sgr-008cf4ec2bb788033	SSH	TCP	22	Custom	35.172.155.96/27
sgr-04b9cf83d691b0062	SSH	TCP	22	Custom	35.172.155.192/27
-	Custom TCP	TCP	8080 - 8081	Anyw...	0.0.0.0/0

**Add rule**

⚠️ Rules with source of 0.0.0.0/0 or ::/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only.

Cancel Preview changes Save rules

Inbound security group rules successfully modified on security group (sg-063baaa137b779b83) | aws-cloud9-MicroservicesIDE-84d2e6fefedab4a0b8214113159ea5ac-InstanceSecurityGroup-1OSOqXTzJhu

Security Groups (1/5)

Name	Security group ID	Security group name	VPC ID	Description
-	sg-063baaa137b779b83	c110323a260559016548437t1w0824...	vpc-043e6f0ce741fda03	Enable inbound
DBSecurityGroup	sg-012f4abba21b3b3d8	DBSecurityGroup	vpc-043e6f0ce741fda03	Enable access
-	sg-0ce210fe840097bec	default	vpc-043e6f0ce741fda03	default VPC s
<b>aws-cloud9-MicroservicesIDE-84d2e6fefedab4a0b8214113159ea5ac</b>	<b>sg-063baaa137b779b83</b>	<b>aws-cloud9-MicroservicesIDE-84d2e6...</b>	<b>vpc-043e6f0ce741fda03</b>	<b>Security grou</b>
-	sg-0c42ad9444d184dd1	default	vpc-000e564836083dd8	default VPC s

Inbound rules (3)

Inbound security group rules successfully modified on security group (sg-063baaa137b779b83) | aws-cloud9-MicroservicesIDE-84d2e6fefedab4a0b8214113159ea5ac-InstanceSecurityGroup-1OSOqXTzJhu

Security Groups (1/5)

Name	Security group rule...	IP version	Type	Protocol	Port range
-	sgr-008cf4ec2bb788033	IPv4	SSH	TCP	22
-	sgr-04b9cf83d691b0062	IPv4	SSH	TCP	22
-	sgr-07adccaf71be7bc78	IPv4	Custom TCP	TCP	8080 - 8081

## Task 4.2: Modify the source code of the *customer* microservice

In this task, you will edit the source code for the *customer* microservice. Recall that the source code you are starting with is an exact copy of the monolithic application. Therefore, it still has features in

it that will be handled by the employee microservice and that you don't want as part of the customer microservice. Specifically, customers shouldn't have the ability to add, edit, or delete suppliers; therefore, the changes that you make will remove that functionality from the source code. Ideally, the source code should contain only code that is needed.

1. In the AWS Cloud9 file panel, collapse the employee directory, if it is expanded, and then expand the customer directory.

The screenshot shows the AWS Cloud9 IDE interface. The file panel on the left displays the project structure:

```

MicroservicesIDE - home.c9users.c9
  |- c9
  |- microservices
    |- customer
      |- app
      |- node_modules
      |- public
      |- views
        |- Dockerfile
        |- index.js
        |- package-lock.json
        |- package.json
    |- employee
    |- labuser.pem
  |- README.md

```

The terminal window at the bottom shows the content of the `labuser.pem` file, which is a long string of RSA PRIVATE KEY data. The terminal prompt is `veclabs:~/environment $`.

2. Edit the `customer/app/controller/supplier.controller.js` file so that the remaining functions provide only the read-only actions that you want customers to be able to perform.

**Tip:** After you edit the file, it should contain only the following lines:

```
const Supplier = require("../models/supplier.model.js");
const {body, validationResult} = require("express-validator");
```

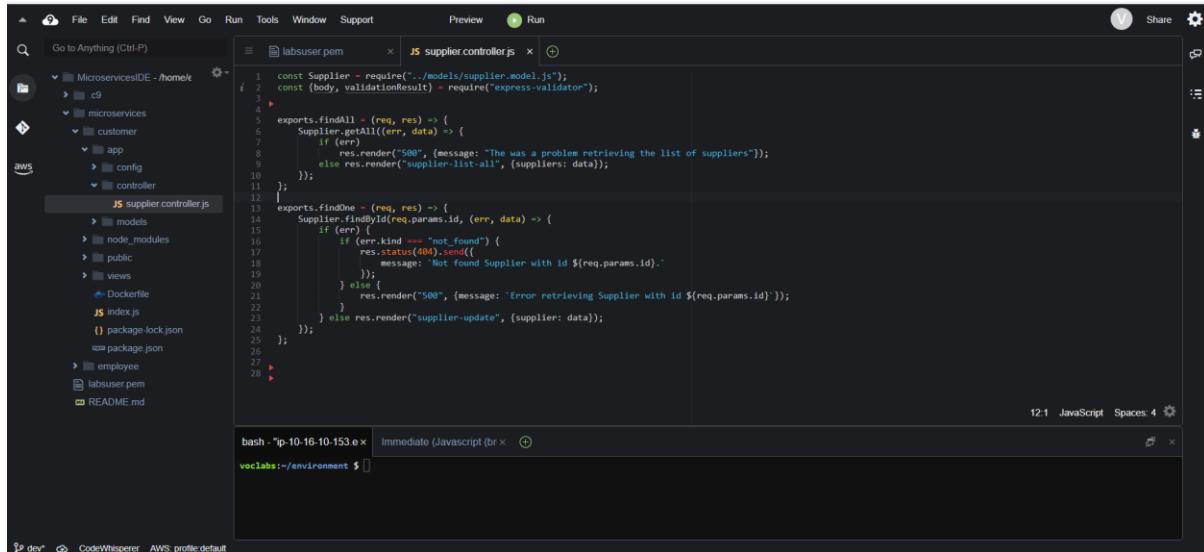
```
exports.findAll = (req, res) => {
  Supplier.getAll((err, data) => {
    if (err)
      res.render("500", {message: "There was a problem retrieving the list of suppliers"});
    else res.render("supplier-list-all", {suppliers: data});
  });
}
```

```
exports.findOne = (req, res) => {
  Supplier.findById(req.params.id, (err, data) => {
```

```

if (err) {
  if (err.kind === "not_found") {
    res.status(404).send({
      message: `Not found Supplier with id ${req.params.id}.`
    });
  } else {
    res.render("500", {message: `Error retrieving Supplier with id ${req.params.id}`});
  }
} else res.render("supplier-update", {supplier: data});

});
```



```

const Supplier = require('../models/supplier.model.js');
const {body, validationResult} = require('express-validator');

exports.findAll = (req, res) => {
  Supplier.getAll((err, data) => {
    if (err)
      res.render('500', {message: 'There was a problem retrieving the list of suppliers'});
    else res.render('supplier-list-all', {suppliers: data});
  });
};

exports.findOne = (req, res) => {
  Supplier.findById(req.params.id, (err, data) => {
    if (err) {
      if (err.kind === "not_found") {
        res.status(404).send({
          message: `Not found Supplier with id ${req.params.id}.`
        });
      } else {
        res.render("500", {message: `Error retrieving Supplier with id ${req.params.id}`});
      }
    } else res.render("supplier-update", {supplier: data});
  });
};
```

3. Edit the customer/app/models/supplier.model.js file. Delete the unnecessary functions in it so that what remains are only read-only functions.

**Important:** *KEEP* the last line of the file: **module.exports = Supplier;**

**Note:** The model should still contain two functions: **Supplier.getAll** and **Supplier.findById**.

The screenshot shows the AWS Lambda CodeWhisperer IDE interface. The left sidebar displays the project structure:

```

MicroservicesIDE - /home/k
  |- c9
  |- microservices
    |- customer
      |- app
        |- config
        |- controller
          |- JS supplier.controller.js
        |- models
          |- JS supplier.model.js
        |- node_modules
        |- public
        |- views
    |- Dockerfile
    |- JS index.js
    |- package-lock.json
    |- package.json
  |- employee
  |- labuser.pem
  |- README.md

```

The main editor tabs show two files:

- supplier.controller.js** (selected):

```

1  const mysql = require("mysql2");
2  const dbConfig = require("../config/config");
3
4  const Supplier = function(supplier) {
5    this.id = supplier.id;
6    this.name = supplier.name;
7    this.address = supplier.address;
8    this.city = supplier.city;
9    this.state = supplier.state;
10   this.email = supplier.email;
11   this.phone = supplier.phone;
12 };
13
14  const db_connection = mysql.createPool({
15    host: dbConfig.APP_DB_HOST,
16    user: dbConfig.APP_DB_USER,
17    password: dbConfig.APP_DB_PASSWORD,
18    database: dbConfig.APP_DB_NAME
19  });
20
21
22  Supplier.getAll = (result) => {
23    db_connection.query("SELECT * FROM suppliers", (err, res) => {
24      if (err) {
25        console.log("error: ", err);
26        result(err, null);
27        return;
28      }
29      console.log("suppliers: ", res);
30      result(null, res);
31    });
32  };
33
34
35  Supplier.findById = (supplierId, result) => {
36    db_connection.query("SELECT * FROM suppliers WHERE id = ${supplierId}", (err, res) => {
37      if (err) {
38        console.log("error: ", err);
39        result(err, null);
40        return;
41      }
42      if (res.length) {
43        console.log("found supplier: ", res[0]);
44        result(null, res[0]);
45      } else {
46        result({kind: "not_found"}, null);
47      }
48    });
49  };
50
51  module.exports = Supplier;
52

```
- supplier.model.js**:

```

1  password: dbConfig.APP_DB_PASSWORD,
2  database: dbConfig.APP_DB_NAME
3
4
5  Supplier.getAll = (result) => {
6    db_connection.query("SELECT * FROM suppliers", (err, res) => {
7      if (err) {
8        console.log("error: ", err);
9        result(err, null);
10       return;
11     }
12     console.log("suppliers: ", res);
13     result(null, res);
14   });
15
16  Supplier.findById = (supplierId, result) => {
17    db_connection.query("SELECT * FROM suppliers WHERE id = ${supplierId}", (err, res) => {
18      if (err) {
19        console.log("error: ", err);
20        result(err, null);
21        return;
22      }
23      if (res.length) {
24        console.log("found supplier: ", res[0]);
25        result(null, res[0]);
26      } else {
27        result({kind: "not_found"}, null);
28      }
29    });
30  };
31
32  module.exports = Supplier;
33

```

The bottom status bar shows "dev" and "CodeWhisperer AWS profile:default".

This screenshot shows the same AWS Lambda CodeWhisperer IDE interface, but with changes made to the **supplier.model.js** file in the previous screenshot.

The **supplier.controller.js** file remains the same as in the first screenshot.

The **supplier.model.js** file now contains the following code:

```

1  password: dbConfig.APP_DB_PASSWORD,
2  database: dbConfig.APP_DB_NAME
3
4
5  Supplier.getAll = (result) => {
6    db_connection.query("SELECT * FROM suppliers", (err, res) => {
7      if (err) {
8        console.log("error: ", err);
9        result(err, null);
10       return;
11     }
12     console.log("suppliers: ", res);
13     result(null, res);
14   });
15
16  Supplier.findById = (supplierId, result) => {
17    db_connection.query("SELECT * FROM suppliers WHERE id = ${supplierId}", (err, res) => {
18      if (err) {
19        console.log("error: ", err);
20        result(err, null);
21        return;
22      }
23      if (res.length) {
24        console.log("found supplier: ", res[0]);
25        result(null, res[0]);
26      } else {
27        result({kind: "not_found"}, null);
28      }
29    });
30  };
31
32  module.exports = Supplier;
33

```

The bottom status bar shows "dev" and "CodeWhisperer AWS profile:default".

- Later in the project, when you deploy the microservices behind an Application Load Balancer, you will want *employees* to be able to navigate from the main *customer* page to the area of the web application where they can add, edit, or delete supplier entries. To support this, edit the *customer/views/nav.html* file:

```

1    password: dbConfig.HPP_DB_PASSWORD,
2    database: dbConfig.HPP_DB_NAME
3  });
4
5  Supplier.getAll = (result) => {
6    db_connection.query("SELECT * FROM suppliers", (err, res) => {
7      if (err) {
8        console.log(`Error: ${err}`);
9        result(null);
10       return;
11     }
12     console.log(`Suppliers: ${res}`);
13     result(null, res);
14   });
15 }
16
17 Supplier.findById = (supplierId, result) => {
18   db_connection.query(`SELECT * FROM suppliers WHERE id = ${supplierId}`, (err, res) => {
19     if (err) {
20       console.log(`Error: ${err}`);
21       result(null);
22       return;
23     }
24     if (res.length) {
25       console.log(`Found supplier: ${res[0]}`);
26       result(null, res[0]);
27     } else {
28       result({kind: "not_found"}, null);
29     }
30   });
31 }
32
33 module.exports = Supplier;
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53

```

- **On line 3, change Monolithic Coffee suppliers to Coffee suppliers**
- **On line 7, change Home to Customer home**
- **Add a new line *after* line 8 that contains the following HTML:**

**Important: DON'T delete or overwrite any of the existing lines in the file.**

<a class="nav-link" href="/admin/suppliers">Administrator link</a>

**Analysis: Adding this link will provide a navigation path to those pages that will be hosted under the /admin/ URL path.**

```

1 <nav class="navbar navbar-expand-lg navbar-dark bg-dark">
2   
3   <div><a href="#">Coffee suppliers</a></div>
4   <div class="collapse navbar-collapse" id="navbarSupportedContent">
5     <ul class="navbar-nav mr-auto">
6       <li class="nav-item active">
7         <a href="#">Customer home</a>
8         <a class="nav-link" href="/suppliers">Suppliers list</a>
9         <a class="nav-link" href="/admin/suppliers">Administrator link</a>
10      </li>
11    </ul>
12  </div>
13 </nav>

```

5. You don't want customers to see the Add a new supplier button or any edit buttons next to supplier rows. To implement these changes, edit the customer/views/supplier-list-all.html file:

- Remove line 32, which contains Add a new supplier.
  - Remove lines 26 and 27, which contain badge badge-info and supplier-update.

The screenshot shows a browser-based development environment. On the left, a sidebar displays a file tree for a project named "MicroservicesIDE". The tree includes folders like ".c9", "microservices", "customer", "app", "controller", "models", and "views", along with files such as "supplier controller.js", "supplier model.js", "Dockerfile", "index.js", "package-lock.json", "package.json", "employee.json", and "labuser.pem".

The main area contains two tabs: "labuser.pem" and "supplier-list-all.html". The "supplier-list-all.html" tab shows the following HTML code:

```
<!DOCTYPE html>
<html>
  <head>
    <title>Supplier List</title>
  </head>
  <body>
    <div class="container">
      <h1>All Suppliers</h1>
      <table class="table table-hover">
        <thead>
          <tr>
            <th scope="col">Name</th>
            <th scope="col">Address</th>
            <th scope="col">City</th>
            <th scope="col">State</th>
            <th scope="col">Email</th>
            <th scope="col">Phone</th>
          </tr>
        </thead>
        <tbody>
          <#> suppliers
          <tr>
            <th scope="row">{{name}}</th>
            <td>{{address}}</td>
            <td>{{city}}</td>
            <td>{{state}}</td>
            <td>{{email}}</td>
            <td>{{phone}}</td>
          </tr>
        </tbody>
      </table>
    </div>
  </body>
</html>
```

At the bottom, a terminal window shows the command "bash -c ip=10.16.10.153 echo \$FOO", with the output "bar".

6. Because the customer microservice doesn't need to support read-write actions, *DELETE* the following .html files from the customer/views directory:

- #### ○ **supplier-add.html**

The screenshot shows the AWS Cloud9 IDE interface. The left sidebar displays a file tree for a project named 'aws'. The right pane shows the content of the file 'supplier-add.html'. A context menu is open over the file, listing options like Open, Download, Run, Preview, Refresh, Rename, Delete, Cut, Copy, Paste, Duplicate, Copy file path, Add to Favorites, Open Terminal Here, Search In This Folder, New File, and New Folder. The 'Delete' option is highlighted.

```

1  {{header}}
2  <div class="container">
3  {{>nav}}
4  <h1>All suppliers</h1>
5  <table class="table table-hover">
6  <thead>
7  <tr>
8      <th scope="col">Name</th>
9      <th scope="col">Address</th>
10     <th scope="col">City</th>
11     <th scope="col">State</th>
12     <th scope="col">Email</th>
13     <th scope="col">Phone</th>
14     <th scope="col"></th>

```

### ○ supplier-form-fields.html

This screenshot is identical to the one above, showing the AWS Cloud9 IDE with the context menu open over the 'supplier-form-fields.html' file. The file content and the options in the context menu are the same as in the previous screenshot.

```

1  {{header}}
2  <div class="container">
3  {{>nav}}
4  <h1>All suppliers</h1>
5  <table class="table table-hover">
6  <thead>
7  <tr>
8      <th scope="col">Name</th>
9      <th scope="col">Address</th>
10     <th scope="col">City</th>
11     <th scope="col">State</th>
12     <th scope="col">Email</th>
13     <th scope="col">Phone</th>
14     <th scope="col"></th>

```

### ○ supplier-update.html

The screenshot shows the AWS Lambda Code Editor interface. On the left is a file tree for a project named 'customer'. In the center is a code editor window titled 'supplier-list-all.html' containing an HTML table template. A modal dialog box titled 'Confirm Remove' is overlaid on the editor, asking 'Do you want to continue? (This change cannot be undone)'. At the bottom right of the modal are 'Yes' and 'No' buttons. The status bar at the bottom indicates '22:30 HTML Spaces: 4'.

This screenshot shows the same AWS Lambda Code Editor environment as the previous one, but the 'Confirm Remove' modal is no longer present. The code editor window still displays the 'supplier-list-all.html' file with its table template. The status bar at the bottom indicates '20:42 HTML Spaces: 4'.

7. Edit the customer/index.js file as needed to account for the fact that the node application will now run on Docker containers:

```

5 const app = express();
6 const mustacheExpress = require('mustache-express')
7 const favicon = require('serve-favicon');
8
9 // parse requests of content-type: application/json
10 app.use(bodyParser.json());
11 // parse requests of content-type: application/x-www-form-urlencoded
12 app.use(bodyParser.urlencoded({extended: true}));
13 app.use(cookieParser());
14 app.options('*', cors());
15 app.engine('html', mustacheExpress())
16 app.set('view engine', 'html')
17 app.set('views', __dirname + '/views')
18 app.use(express.static('public'));
19 app.use(favicon, dirname + '/public/img/favicon.ico'));
20
21 // list all the suppliers
22 app.get('/', (req, res) => {
23   res.render('home', {});
24 });
25 app.get('/suppliers/', supplier.findAll);
26 // show the add supplier form
27 app.get('/supplier-add', (req, res) => {
28   res.render('supplier-add', {});
29 });
30 // receive the add supplier POST
31 app.post('/supplier-add', supplier.create);
32
33 app.get('/supplier-update/:id', supplier.findOne);
34 // receive the update POST
35 app.post('/supplier-update', supplier.update);
36 // receive the POST to delete a supplier
37 app.post('/supplier-remove/:id', supplier.remove);
38 // handle 404
39 app.use(function (req, res, next) {
40   res.status(404).render('404', {});
41 })
42

```

- Comment out lines 27 to 37 (ensure that each line starts with //).

```

5 const app = express();
6 const mustacheExpress = require('mustache-express')
7 const favicon = require('serve-favicon');
8
9 // parse requests of content-type: application/json
10 app.use(bodyParser.json());
11 // parse requests of content-type: application/x-www-form-urlencoded
12 app.use(bodyParser.urlencoded({extended: true}));
13 app.use(cookieParser());
14 app.options('*', cors());
15 app.engine('html', mustacheExpress())
16 app.set('view engine', 'html')
17 app.set('views', __dirname + '/views')
18 app.use(express.static('public'));
19 app.use(favicon, dirname + '/public/img/favicon.ico'));
20
21 // list all the suppliers
22 app.get('/', (req, res) => {
23   res.render('home', {});
24 });
25 app.get('/suppliers/', supplier.findAll);
26 // show the add supplier form
27 // app.get('/supplier-add', (req, res) => {
28 //   res.render('supplier-add', {});
29 // });
30 // receive the add supplier POST
31 // app.post('/supplier-add', supplier.create);
32
33 // app.get('/supplier-update/:id', supplier.findOne);
34 // receive the update POST
35 // app.post('/supplier-update', supplier.update);
36 // receive the POST to delete a supplier
37 // app.post('/supplier-remove/:id', supplier.remove);
38 // handle 404
39 app.use(function (req, res, next) {
40   res.status(404).render('404', {});
41 })
42

```

- On line 45, change the port number to 8080

**Tip:** Recall that when this application ran on the *MonolithicAppServer* instance, it ran on port 80. However, when it runs as a Docker container, you will want the container to run on port 8080.

```

13 app.use(cors());
14 app.options("*", cors());
15 app.engine("html", mustacheExpress())
16 app.set("view engine", "html")
17 app.set("views", __dirname + "/views")
18 app.use(express.static("public"));
19 app.use(favicon_, dirname + "/public/img/favicon.ico");

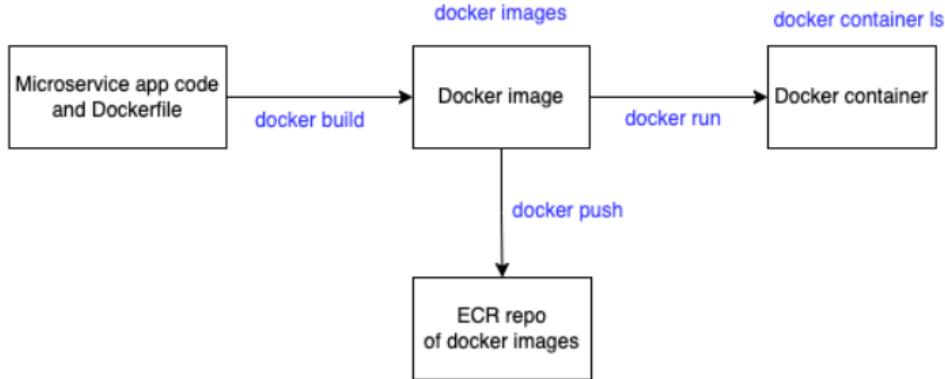
20 // list all the suppliers
21 app.get("/", (req, res) => {
22   res.render("home", {});
23 });
24 app.get("/suppliers/", supplier.findAll);
25 // show the add form
26 app.get("/supplier-add", (req, res) => {
27   // ...
28   res.render("supplier-add", {});
29 });
30 // receive the add supplier POST
31 app.post("/supplier-add", supplier.create);
32 // show the update form
33 app.get("/supplier-update/:id", supplier.findOne);
34 // receive the update POST
35 app.post("/supplier-update/:id", supplier.update);
36 // receive the POST to delete a supplier
37 app.post("/supplier-remove/:id", supplier.remove);
38 // handle 404
39 app.use(function (req, res, next) {
40   res.status(404).render("404", {});
41 });
42
43 // set port, listen for requests
44 const app_port = process.env.APP_PORT || 8080
45 app.listen(app_port, () => {
46   console.log(`Server is running on port ${app_port}.`);
47 });

```

bash - \*ip-10-16-10-153.eks.internal ip-10-16-10-153.eks.internal [~] \$

### Task 4.3: Create the *customer* microservice Dockerfile and launch a test container

The following diagram provides an overview of how you will use [Docker](#). Assets that you will use or create are represented by rectangles. Commands that you will use are shown in blue between and above the rectangles.



With the application code base and a Dockerfile, which you will create, you will build a *Docker image*. A Docker image is a template with instructions to create and run a Docker *container*. You can think of a Docker *image* as roughly equivalent to an Amazon Machine Image (AMI) from which you can launch an EC2 instance. A Docker *container* is roughly equivalent to an EC2 instance. However, Docker images and containers are much smaller.

1. In the customer directory, create a new file named Dockerfile that contains the following code:

```
FROM node:11-alpine
```

```
RUN mkdir -p /usr/src/app
```

```
WORKDIR /usr/src/app
```

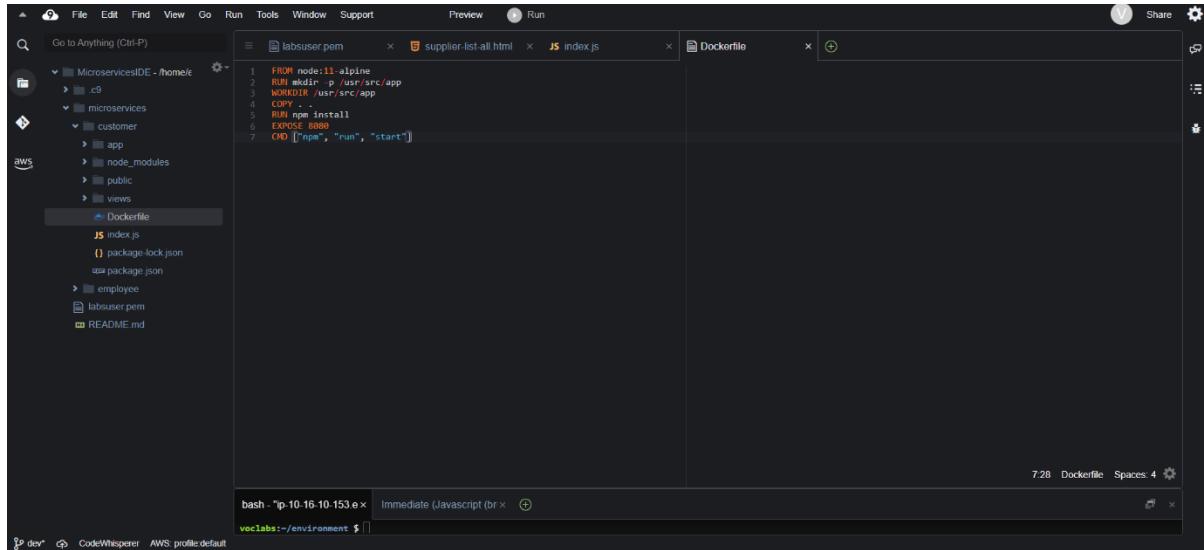
```
COPY . .
```

```
RUN npm install
```

```
EXPOSE 8080
```

```
CMD ["npm", "run", "start"]
```

**Analysis:** This Dockerfile code specifies that an Alpine Linux distribution with Node.js runtime requirements should be used to create a Docker image. The code also specifies that the container should allow network traffic on TCP port 8080 and that the application should be run and started when a container that was created from the image is launched.



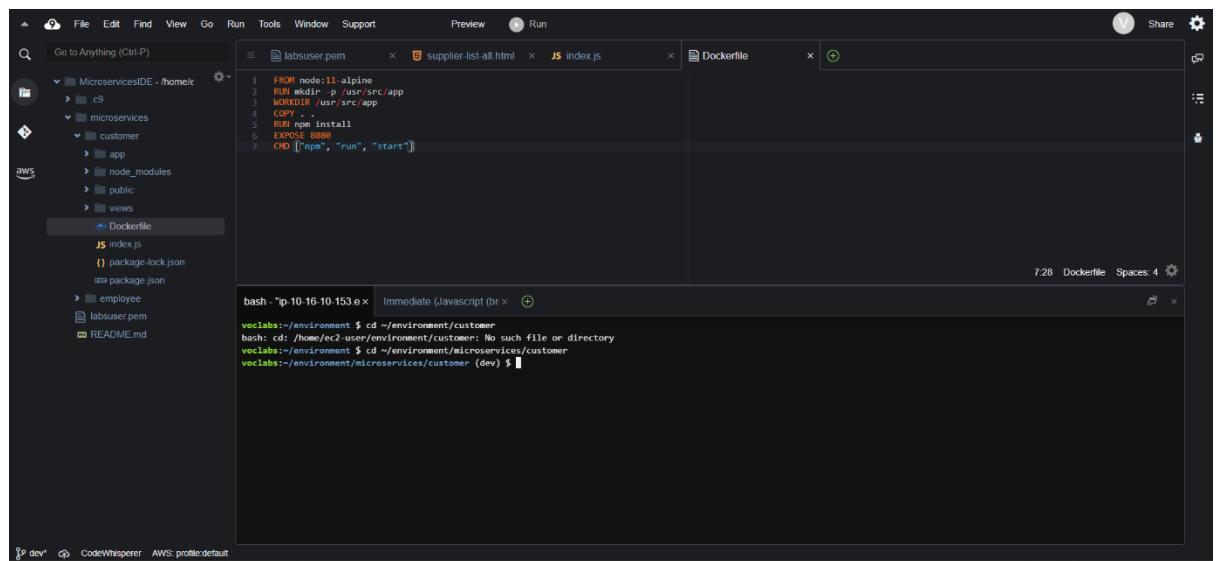
The screenshot shows the AWS Cloud9 IDE interface. On the left, the file tree displays a project structure with files like `index.js`, `package.json`, and `Dockerfile`. The `Dockerfile` tab is open and contains the following code:

```
FROM node:11-alpine
RUN mkdir -p /usr/src/app
WORKDIR /usr/src/app
COPY . .
RUN npm install
EXPOSE 8080
CMD ["npm", "run", "start"]
```

Below the code editor is a terminal window showing the command `veclabs:-/environment $`. The status bar at the bottom indicates "7.28 Dockerfile Spaces: 4".

## 2. Build an image from the customer Dockerfile.

- In the AWS Cloud9 terminal, change to the customer directory.



The screenshot shows the AWS Cloud9 IDE interface. The terminal window now shows the user has changed to the `/environment/customer` directory. The command `cd ~/environment/customer` was run, followed by `ls` which returned an error message: `bash: cd: /home/ec2-user/environment/customer: No such file or directory`. The status bar at the bottom indicates "7.28 Dockerfile Spaces: 4".

- Run the following command:

```
docker build --tag customer .
```

**Note:** In the output, ignore the npm warning about no repository field.

Notice that the build downloaded the node Alpine starter image and then completed the other instructions as specified in the Dockerfile.

```

FROM node:11-alpine
RUN mkdir -p /usr/src/app
WORKDIR /usr/src/app
RUN npm install
EXPOSE 8088
CMD ["npm", "run", "start"]
    
```

CodeWhisperer IDE interface showing the Dockerfile tab with the command `CMD ["npm", "run", "start"]` highlighted. The terminal shows the build process:

```

bash - *p-10-16-10-153.ex  Immediate Javascript (br x)
veclabs:/environment $ cd ~/environment/customer
veclabs:~/environment $ cd /home/ec2-user/environment/customer; No such file or directory
veclabs:/environment $ cd ~/environment/microservices/customer
veclabs:/environment/microservices/customer (dev) $ docker build --tag customer .
    
```

CodeWhisperer IDE interface showing the Dockerfile tab with the command `CMD ["npm", "run", "start"]` highlighted. The terminal shows the build process:

```

veclabs:/environment/microservices (dev) $ cd ~/environment/microservices/customer
veclabs:~/environment/microservices/customer (dev) $ docker build --tag customer .
Sending build context to Docker daemon 9.00MB
Step 1/7 : FROM node:11-alpine
11-alpine: Pulling from library/node
0119aca4649: Pull complete
40df19665a18: Pull complete
82194b8b4a64: Pull complete
Digest: sha256:b8b5bab19729c8ff820f1a55462890caf08f57ffe3b91f5fa6945ad5b5932
Status: Downloaded newer image for node:11-alpine
--> f18da2f58c3d
Step 2/7 : RUN mkdir -p /usr/src/app
--> Running in bld79738268
Removing intermediate container b1d579738268
--> 39f01094b424
Step 3/7 : WORKDIR /usr/src/app
--> Running in 6c6e93de1dbd
Removing intermediate container 6c6e93de1dbd
--> d520ad4c28d
Step 4/7 : COPY . .
--> 0065293bb019
Step 5/7 : RUN npm install
--> Running in 3515936dc784
--> npm WARN coffee-script@1.0.0 No repository field.
audited 78 packages in 0.73s
found 10 vulnerabilities (5 moderate, 3 high, 2 critical)
  run 'npm audit fix' to fix them, or 'npm audit' for details
Removing intermediate container 3515936dc784
--> 63bc34d72998
Step 6/7 : EXPOSE 8088
--> Running in 8080d5baed33d
Removing intermediate container 8080d5baed33d
--> 296c9b29065a
Step 7/7 : CMD ["npm", "run", "start"]
--> Running in fcfa16177a79
    
```

CodeWhisperer IDE interface showing the Dockerfile tab with the command `CMD ["npm", "run", "start"]` highlighted. The terminal shows the build process:

```

veclabs:/environment/microservices (dev) $ cd ~/environment/microservices/customer
veclabs:~/environment/microservices/customer (dev) $ docker build --tag customer .
Sending build context to Docker daemon 9.00MB
Step 1/7 : FROM node:11-alpine
11-alpine: Pulling from library/node
0119aca4649: Pull complete
40df19665a18: Pull complete
82194b8b4a64: Pull complete
Digest: sha256:b8b5bab19729c8ff820f1a55462890caf08f57ffe3b91f5fa6945ad5b5932
Status: Downloaded newer image for node:11-alpine
--> f18da2f58c3d
Step 2/7 : RUN mkdir -p /usr/src/app
--> Running in bld79738268
Removing intermediate container b1d579738268
--> 39f01094b424
Step 3/7 : WORKDIR /usr/src/app
--> Running in 6c6e93de1dbd
Removing intermediate container 6c6e93de1dbd
--> d520ad4c28d
Step 4/7 : COPY . .
--> 0065293bb019
Step 5/7 : RUN npm install
--> Running in 3515936dc784
--> npm WARN coffee-script@1.0.0 No repository field.
audited 78 packages in 0.73s
found 10 vulnerabilities (5 moderate, 3 high, 2 critical)
  run 'npm audit fix' to fix them, or 'npm audit' for details
Removing intermediate container 3515936dc784
--> 63bc34d72998
Step 6/7 : EXPOSE 8088
--> Running in 8080d5baed33d
Removing intermediate container 8080d5baed33d
--> 296c9b29065a
Step 7/7 : CMD ["npm", "run", "start"]
--> Running in fcfa16177a79
Removing intermediate container fcfa16177a79
--> 2a3653127983
Successfully built 2a3653127983
Successfully tagged customer:latest
veclabs:/environment/microservices/customer (dev) $
    
```

### 3. Verify that the customer-labeled Docker image was created.

- Run a Docker command to list the Docker images that your Docker client is aware of.

**Tip:** To find the command that you need to run, see [Use the Docker Command Line](#) in the Docker documentation.

**Tip:** The output of the command should be similar to the following:

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
customer	latest	cdc593c9bf51	59 seconds ago	82.7MB
node	11-alpine	f18da2f58c3d	3 years ago	75.5MB

**Note:** The *node* image is the Alpine Linux image that you identified in the Dockerfile contents to download and use as the starter image. Your Docker client downloaded it from docker.io. The *customer* image is the one that you created.

I used the command “`docker images`”

The screenshot shows the AWS Lambda IDE interface. On the left, there's a file tree with a folder named "MicroservicesIDE - /home/ec2-user" containing subfolders like "microservices", "aws", and "supplier-list-all". The "Dockerfile" tab is selected, displaying the Dockerfile content and its build logs. The logs show the creation of the "node" image from the "node:11-alpine" base image, including steps for creating a directory, copying files, and installing npm packages. The "customer" image is also listed as being built. The terminal tab at the bottom shows the command "docker images" being run, which lists the available Docker images: "customer latest" with ID "2a3653127983" and "node 11-alpine" with ID "f18da2f58c3d".

### 4. Launch a Docker container that runs the *customer* microservice on port 8080. As part of the command, pass an environment variable to tell the node application the correct location of the database.

- To set a `dbEndpoint` variable in your terminal session, run the following commands:

```
dbEndpoint=$(cat ~environment/microservices/customer/app/config/config.js | grep 'APP_DB_HOST' | cut -d '"' -f2)  
echo $dbEndpoint
```

The screenshot shows the AWS Cloud9 IDE interface. On the left is a file tree for a project named 'MicroservicesIDE - /home/ec2-user'. The 'Dockerfile' is selected. On the right is a terminal window titled 'Dockerfile' showing the build process:

```

Step 1/1 : RUN mkdir -p /usr/src/app
--> Running in b1d579738268
Removing intermediate container b1d579738268
--> 39f01094b242
Step 3/7 : WORKDIR /usr/src/app
--> Running in 6c6e93de1dbd
Removing intermediate container 6c6e93de1dbd
--> d920ad4c28d
Step 4/7 : COPY .
--> 63bc34d72984
Step 5/7 : RUN npm install
--> Running in 3515036dc784
npm WARN coffee_ap@1.0.0 No repository field.

audited 78 packages in 0.73s
found 10 vulnerabilities (5 moderate, 3 high, 2 critical)
  run 'npm audit fix' to fix them, or 'npm audit' for details
Removing intermediate container 3515036dc784
--> 2a3653127983
Step 6/7 : EXPOSE 8080
--> Running in 080d5baed33d
Removing intermediate container 080d5baed33d
--> 296c9b29065a
Step 7/7 : CMD ["npm", "run", "start"]
--> Running in fccfa16177a9
Removing intermediate container fccfa16177a9
--> 2a3653127983
Successfully tagged customer:latest
voclab:~/environment/microservices/customer (dev) $ docker images
REPOSITORY TAG IMAGE ID CREATED SIZE
customer latest 2a3653127983 5 minutes ago 82.7MB
node 11-alpine f18da2f58c3d 4 years ago 75.5MB
voclab:~/environment/microservices/customer (dev) $ echo $dbEndpoint
supplierdb.cjoagd7hycvt.us-east-1.rds.amazonaws.com
voclab:~/environment/microservices/customer (dev) $ 

```

**Note:** You could manually find the database endpoint in the Amazon RDS console and set it as an environment variable by running `dbEndpoint="<actual-db-endpoint>"` instead of using the cat command.

**Important:** If you close your AWS Cloud9 terminal or stop and restart the project lab environment, and then need to run a command that uses the `$dbEndpoint` variable, you might need to create the variable again. To test whether the variable is set, run `echo $dbEndpoint`

- The following code provides an example of the command you should run that launches a container from the image:

`docker run -d --name customer_1 -p 8080:8080 -e APP_DB_HOST="$dbEndpoint" customer`

The screenshot shows the AWS Cloud9 IDE interface. The terminal output now includes the command run:

```

Removing intermediate container b1d579738268
--> 39f01094b242
Step 3/7 : WORKDIR /usr/src/app
--> Running in 6c6e93de1dbd
Removing intermediate container 6c6e93de1dbd
--> d920ad4c28d
Step 4/7 : COPY .
--> 63bc34d72984
Step 5/7 : RUN npm install
--> Running in 3515036dc784
npm WARN coffee_ap@1.0.0 No repository field.

audited 78 packages in 0.73s
found 10 vulnerabilities (5 moderate, 3 high, 2 critical)
  run 'npm audit fix' to fix them, or 'npm audit' for details
Removing intermediate container 3515036dc784
--> 2a3653127983
Step 6/7 : EXPOSE 8080
--> Running in 080d5baed33d
Removing intermediate container 080d5baed33d
--> 296c9b29065a
Step 7/7 : CMD ["npm", "run", "start"]
--> Running in fccfa16177a9
Removing intermediate container fccfa16177a9
--> 2a3653127983
Successfully tagged customer:latest
voclab:~/environment/microservices/customer (dev) $ docker images
REPOSITORY TAG IMAGE ID CREATED SIZE
customer latest 2a3653127983 5 minutes ago 82.7MB
node 11-alpine f18da2f58c3d 4 years ago 75.5MB
voclab:~/environment/microservices/customer (dev) $ echo $dbEndpoint
supplierdb.cjoagd7hycvt.us-east-1.rds.amazonaws.com
voclab:~/environment/microservices/customer (dev) $ docker run -d --name customer_1 -p 8080:8080 -e APP_DB_HOST="$dbEndpoint" customer
0fa16f14a8a5b8e5b4298d29da2119586c1784c36fb808cfef1a4b374d
voclab:~/environment/microservices/customer (dev) $ 

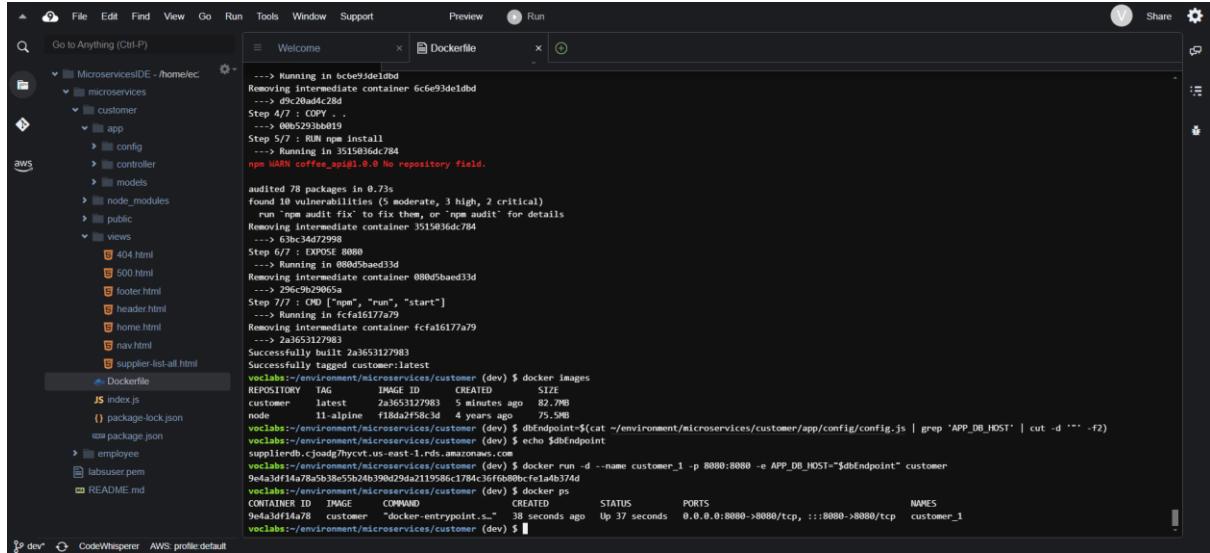
```

**Analysis:** This command launched a container named `customer_1` by using the `customer` image that you created as the template. The `-d` parameter in the command specified that it should run in the background. After the `-p` parameter, the *first number* specified the port on the AWS Cloud9 instance to publish the container to. The *second number* indicated the port that the container is running on in the *docker namespace* (also port 8080). The `-e` parameter passes the database host location as an environment variable to Docker, which gives the node application the information that it needs to establish network connectivity to the database.

## 5. Check which Docker containers are currently running on the AWS Cloud9 instance.

**Tip:** To find the command that you need to run, see [Use the Docker Command Line](#) in the Docker documentation.

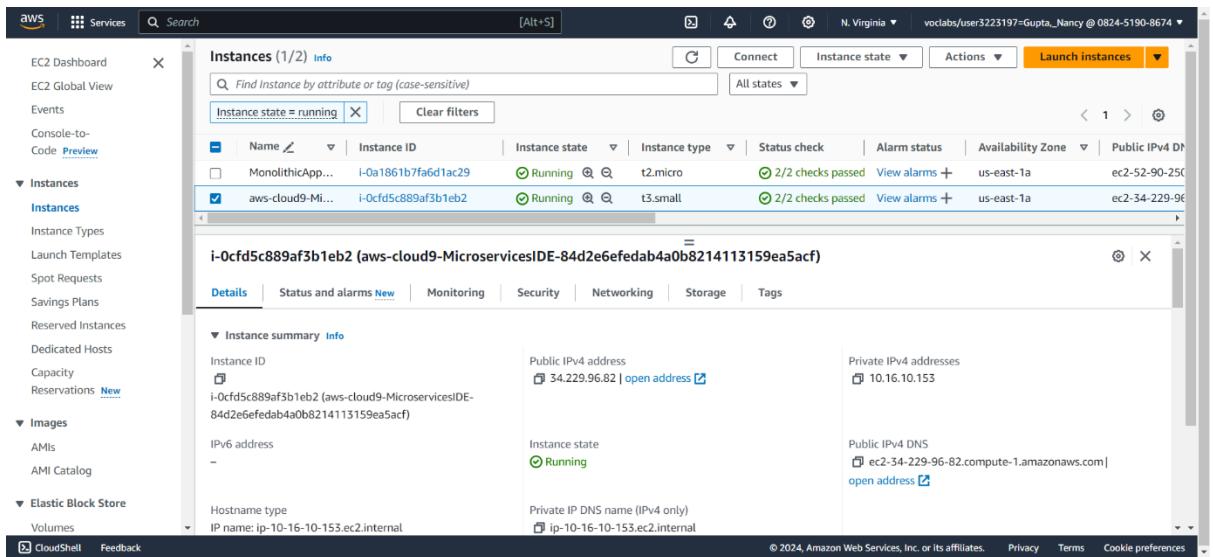
I used the command “`docker ps`”



```
...-> Running in bcbe93de1dbd
Removing intermediate container 6c6e93de1dbd
--> d9c20add4c28d
Step 4/7 : COPY . .
--> 35150393bb019
Step 5/7 : RUN npm install
--> Running in 35150393dc784
npm WARN coffee_apigl@0.0.0 No repository field.

audited 78 packages in 0.73s
found 10 vulnerabilities (5 moderate, 3 high, 2 critical)
  run 'npm audit fix' to fix them, or 'npm audit' for details
Removed intermediate container 35150393dc784
--> 639246d72998
Step 6/7 : EXPOSE 8080
--> Running in 080d5baed33d
Removing intermediate container 080d5baed33d
--> 296c9b29065a
Step 7/7 : CMD [ "npm", "run", "start" ]
--> Running in fcfa16177a79
Removing intermediate container fcfa16177a79
--> 2a3653127983
Successfully built 2a3653127983
Successfully tagged customer:latest
repository: /environment/microservices/customer (dev) $ docker images
REPOSITORY          TAG           IMAGE ID            CREATED             SIZE
customer           latest        2a3653127983   5 minutes ago    82.7MB
node               11-alpine    f18da2f258c3d   4 years ago       75.5MB
voclabs:/environment/microservices/customer (dev) $ dbEndpoint=$(cat -/environment/microservices/customer/app/config/config.js | grep 'APP_DB_HOST' | cut -d '' -f2)
voclabs:/environment/microservices/customer (dev) $ echo $dbEndpoint
supplierdb.cjoagd7hcvt.us-east-1.rds.amazonaws.com
voclabs:/environment/microservices/customer (dev) $ docker run -d --name customer_1 -p 8080:8080 -e APP_DB_HOST="$dbEndpoint" customer
9ea3a1df14a78a5b38e5b24b39629d211958c1784c361688bfefab4b374d
voclabs:/environment/microservices/customer (dev) $ curl -s http://customer_1:8080/
CONTAINER ID        IMAGE               COMMAND             CREATED            STATUS              PORTS             NAMES
9ea3a1df14a78a5b38e5b24b39629d211958c1784c361688bfefab4b374d   "curl -s http://customer_1:8080/"   38 seconds ago   Up 37 seconds   0.0.0.0:8080->8080/tcp, :::8080->8080/tcp   customer_1
voclabs:/environment/microservices/customer (dev) $
```

## 6. Verify that the *customer* microservice is running in the container and working as intended.



The screenshot shows the AWS Cloud9 Instances page. The left sidebar includes options like EC2 Dashboard, EC2 Global View, Events, Console-to-Code Preview, Instances (selected), Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Capacity, Reservations (New), Images (AMIs, AMI Catalog), and Elastic Block Store (Volumes). The main content area displays two instances:

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS
MonolithicApp...	i-0a1861b7fa6d1ac29	Running	t2.micro	2/2 checks passed	View alarms +	us-east-1a	ec2-52-90-250-119
aws-cloud9-Mi...	i-0cf5c889af3b1eb2	Running	t3.small	2/2 checks passed	View alarms +	us-east-1a	ec2-34-229-96-82

Details for the aws-cloud9 instance:

- Public IPv4 address:** 34.229.96.82 | [open address](#) | [Copy public IPv4 address to clipboard](#)
- Private IP4 addresses:** 10.16.10.153
- Public IPv4 DNS:** ec2-34-229-96-82.compute-1.amazonaws.com | [open address](#)

- Load the following page in a new browser tab. Replace the IP address placeholder with the public IPv4 address of the AWS Cloud9 instance that you are using:  
<http://<cloud-9-public-IPv4-address>:8080>

The web application microservice should load in the browser.

The screenshot shows a web browser displaying the 'Coffee suppliers' application. The page has a dark header with the title 'Customer home'. Below the header, there's a photo of two cups of coffee on a tray. The main content area has a dark background with white text. It says 'Welcome' at the top, followed by 'Use this app to keep track of your coffee suppliers'. There are three blue links: 'List of suppliers', 'Customer home', 'Suppliers list', and 'Administrator link'.

**Important:** If you stop the lab environment and start it again, the public IPv4 address of the AWS Cloud9 instance will change.

- Choose List of suppliers.

After clicking on “List of Suppliers”, I got this page of the website

The screenshot shows a web browser window with the URL [34.229.96.82:8080/suppliers](http://34.229.96.82:8080/suppliers). The page has a dark header with the text "Customer home", "Suppliers list", and "Administrator link". The main content area features a small image of two cups of coffee on a espresso machine. Below the image, the text "Coffee suppliers" is displayed in large white letters. Underneath, a sub-section titled "All suppliers" is shown with a table. The table has columns for Name, Address, City, State, Email, and Phone. One row is present, representing "Nancy\_Supplier1" with the details: 1 Castle Point Terrace, Hoboken, New Jersey, ngupta19@stevens.edu, and 5512098571.

Name	Address	City	State	Email	Phone
Nancy_Supplier1	1 Castle Point Terrace	Hoboken	New Jersey	ngupta19@stevens.edu	5512098571

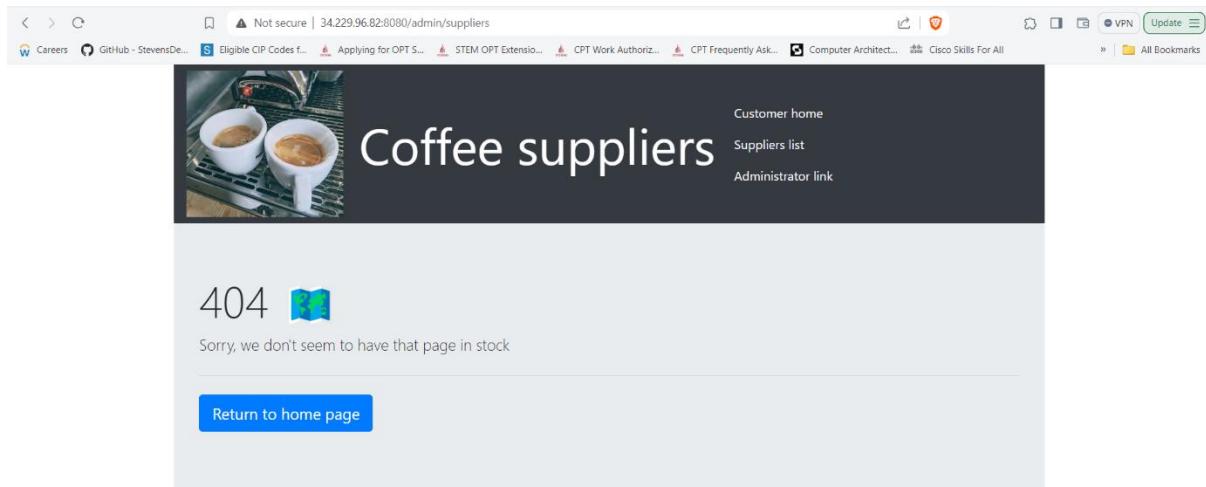
- Confirm that the supplier entries that you added earlier are displayed.

**Note:** Although you changed the location where the application runs, it still connects to the same RDS database where the supplier records are stored.

This screenshot is identical to the one above, showing the "Coffee suppliers" page with the "All suppliers" section and the single supplier entry for "Nancy\_Supplier1".

Name	Address	City	State	Email	Phone
Nancy_Supplier1	1 Castle Point Terrace	Hoboken	New Jersey	ngupta19@stevens.edu	5512098571

**Tip:** The Administrator link doesn't work because you haven't created the employee microservice yet.



- Confirm that the suppliers page doesn't have Add a new supplier and edit buttons.

Name	Address	City	State	Email	Phone
Nancy_Supplier1	1 Castle Point Terrace	Hoboken	New Jersey	ngupta19@stevens.edu	5512098571

**Troubleshooting tip:** If any functionality is missing, follow these steps: (1) Stop and delete the running container, (2) modify the microservice source code as appropriate, (3) create an updated Docker image from the source code, (4) launch a new test container, and (5) verify whether the functionality is now available. For a list of commands to run to accomplish these steps, see [Updating a test container running on Cloud9](#) in the appendix of this file.

## 7. Commit and push your source code changes into CodeCommit.

**Tip:** You can use the [Git source control panel](#) in the AWS Cloud9 IDE, or you can use the git commit and git push commands in the terminal.

**Note:** If your educator has asked you to collect information about your solution, be sure to record the commands that you run in this step and the output that was returned.

A screenshot of a code editor interface. On the left is a file tree for a project named 'MicroservicesIDE - /home/ec2-user'. The 'Dockerfile' is selected. In the center, there are three tabs: 'labuser.pem', 'supplier-list-all.html', and 'index.js'. Below these tabs is a terminal window titled 'Dockerfile' showing the following content:

```
FROM node:11-alpine
RUN mkdir -p /usr/src/app
WORKDIR /usr/src/app
COPY . .
RUN npm install
EXPOSE 8080
CMD ["npm", "run", "start"]

bash -ip:10.16.10.153.x | Immediate Javascript (br x)
```

The terminal also displays the output of running the Dockerfile, which includes commands like 'docker run -d --name customer\_1 -p 8080:8080 -e APP\_DB\_HOST=\$dbEndpoint customer', 'docker ps', and 'git status'. The status shows no changes staged for commit.

A screenshot of a code editor interface, identical to the one above, showing the same project structure and Dockerfile. The terminal output is identical, showing the Dockerfile execution and a clean git status.

A screenshot of a code editor interface, identical to the ones above, showing the same project structure and Dockerfile. The terminal output is identical, showing the Dockerfile execution and a clean git status. This screenshot appears to be from a later point in the sequence where some changes have been made but not yet committed.

The screenshot shows the AWS CodeCommit IDE interface. On the left, there's a file tree for a repository named 'MicroservicesIDE'. In the center, there are four tabs: 'labuser.pem' (selected), 'supplier-list-all.html', 'index.js', and 'Dockerfile'. On the right, there's a terminal window titled 'Immediate (Javascript (br x))' showing a git push command being run. The terminal output indicates that a commit is being pushed to a branch named 'dev'. The commit message is "I am pushing source code into code commit as said". The terminal also shows the process of compressing objects and writing them to disk.

```

FROM node:11-alpine
RUN mkdir -p /usr/src/app
WORKDIR /usr/src/app
RUN npm install
EXPOSE 8888
CMD ["npm", "run", "start"]

git -> ip 10-16-10-153 ec2 x Immediate (Javascript (br x))
veclabs:/environment/microservices/customer (dev) $ git commit -m "I am pushing source code into code commit as said"
[dev files changed, 15 insertions(+), 262 deletions(-)
create mode 100644 customer/Dockerfile
delete mode 100644 customer/views/supplier-add.html
delete mode 100644 customer/views/supplier-form-fields.html
delete mode 100644 customer/views/supplier-update.html
veclabs:/environment/microservices/customer (dev) $ git push
fatal: The current branch dev has no upstream branch.
To push the current branch and set the remote as upstream, use

        git push --set-upstream origin dev

To have this happen automatically for branches without a tracking
upstream, see 'push.autoSetupRemote' in 'git help config'.

veclabs:/environment/microservices/customer (dev) $ git push --set-upstream origin dev
Enumerating objects: 24, done.
Counting objects: 24, done.
Delta compression using up to 2 threads
Compressing objects: 100% (12/12), done.
Writing objects: 100% (13/13), 1.33 KiB | 681.00 KiB/s, done.
Total 13 (delta 6), reused 0 (delta 0), pack-reused 0
remote: Validating objects: 100%
To https://git-codecommit.us-east-1.amazonaws.com/v1/repos/microservices
  f313d...cb8e5e00 dev -> dev
branch 'dev' set up to track 'origin/dev'.
veclabs:/environment/microservices/customer (dev) $

```

This screenshot is similar to the one above, showing the AWS CodeCommit IDE interface. The file tree, tabs, and terminal window are identical. However, the terminal output shows a different commit message: "To have this happen automatically for branches without a tracking upstream, see 'push.autoSetupRemote' in 'git help config'." This indicates a different step or context in the process.

```

FROM node:11-alpine
RUN mkdir -p /usr/src/app
WORKDIR /usr/src/app
RUN npm install
EXPOSE 8888
CMD ["npm", "run", "start"]

git -> ip 10-16-10-153 ec2 x Immediate (Javascript (br x))
delete mode 100644 customer/views/supplier-form-fields.html
delete mode 100644 customer/views/supplier-update.html
veclabs:/environment/microservices/customer (dev) $ git push
fatal: The current branch dev has no upstream branch.
To push the current branch and set the remote as upstream, use

        git push --set-upstream origin dev

veclabs:/environment/microservices/customer (dev) $ git push --set-upstream origin dev
To have this happen automatically for branches without a tracking
upstream, see 'push.autoSetupRemote' in 'git help config'.

veclabs:/environment/microservices/customer (dev) $ git push --set-upstream origin dev
Enumerating objects: 24, done.
Counting objects: 100% (24/24), done.
Delta compression using up to 2 threads
Compressing objects: 100% (12/12), done.
Writing objects: 100% (13/13), 1.33 KiB | 681.00 KiB/s, done.
Total 13 (delta 6), reused 0 (delta 0), pack-reused 0
remote: Validating objects: 100%
To https://git-codecommit.us-east-1.amazonaws.com/v1/repos/microservices
  f313d...cb8e5e00 dev -> dev
branch 'dev' set up to track 'origin/dev'.
veclabs:/environment/microservices/customer (dev) $ git status
On branch dev
Your branch is up to date with 'origin/dev'.

nothing to commit, working tree clean
veclabs:/environment/microservices/customer (dev) $

```

## 8. Optional: Observe the commit details in the CodeCommit console.

In the **Commits** area of the repository, choose the ID for the most recent commit. Scroll down to see information about what changed in the files since the previous commit.

Notice that deleted lines are shown in red, and added lines are shown in green so that you are able to see every detail of every change to every file that was modified.

AWS Services Search [Alt+S]

Developer Tools > CodeCommit > Repositories > microservices > Commits

## microservices

Commits Commit visualizer Compare commits

Commits Info Reference dev

Commit ID	Commit message	Commit date	Authored date	Author	Committer	Actions
cb85e606	I am pushing source code into code commit as said	1 minute ago	1 minute ago	Nancy	Nancy	<a href="#">Copy ID</a> <a href="#">Browse</a>
f3143dc2	two unmodified copies of the application code	5 hours ago	5 hours ago	Nancy	Nancy	<a href="#">Copy ID</a> <a href="#">Browse</a>

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AWS Services Search [Alt+S]

Developer Tools > CodeCommit > Repositories > microservices > Commits > cb85e60678c0ef44ac3afc14e94a7b342a7b1c14

### Commit cb85e60678c0ef44ac3afc14e94a7b342a7b1c14

Copy commit ID [Browse](#)

▼ Details

Author	Authored date	Committer
Nancy ngupta19@stevens.edu	3 minutes ago	Nancy ngupta19@stevens.edu
Commit date	Parent commit	
3 minutes ago	f3143dc2ee62e47413602d2d0f73a171bb9b2c34	
Commit message	I am pushing source code into code commit as said	

Page 1 of 1 Go to file Hide comments Hide whitespace changes Unified Split

▼ customer/Dockerfile Added

```
1 + FROM node:11-alpine
2 + RUN mkdir -p /usr/src/app
3 + WORKDIR /usr/src/app
4 + COPY . .
5 + RUN npm install
6 + EXPOSE 8080
7 + CMD ["npm", "run", "start"]
```

Browse file contents Comment on file

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AWS Services Search [Alt+S]

Developer Tools > CodeCommit > Repositories > microservices > Commits > cb85e60678c0ef44ac3afc14e94a7b342a7b1c14

▼ customer/Dockerfile Added

```
1 + FROM node:11-alpine
2 + RUN mkdir -p /usr/src/app
3 + WORKDIR /usr/src/app
4 + COPY . .
5 + RUN npm install
6 + EXPOSE 8080
7 + CMD ["npm", "run", "start"]
```

Browse file contents Comment on file

▼ customer/app/controller/supplier.controller.js

```
1 const Supplier = require("../models/supplier.model.js");
2 const {body, validationResult} = require("express-validator");
3
4 exports.create = [
5   // validate and sanitize the name field,
6   body('name', 'The supplier name is required').trim().isLength({min: 1}).escape(),
7   body('address', 'The supplier address is required').trim().isLength({min: 1}).escape(),
8   body('city', 'The supplier city is required').trim().isLength({min: 1}).escape(),
9   body('state', 'The supplier state is required').trim().isLength({min: 1}).escape(),
10  body('phone', 'Phone number should be 10 digit number plus optional country code').trim().isMobilePhone().escape(),
11  // Process request after validation and sanitization.
12  (req, res, next) => {
```

Browse file contents Comment on file

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```
aws Services Search [Alt+S] N. Virginia v voclabs/user223197=Gupta_Nancy @0824-5190-8674

Developer Tools X
CodeCommit

Source • CodeCommit
Getting started
Repositories
Code
Pull requests
Commits
Branches
Git tags
Settings
Approval rule templates

Artifacts • CodeArtifact
Build • CodeBuild
Deploy • CodeDeploy
Pipeline • CodePipeline
Settings

5      - // Validate and sanitize the name field.
6      - body('name', 'The supplier name is required').trim().isLength({min: 1}).escape(),
7      - body('address', 'The supplier address is required').trim().isLength({min: 1}).escape(),
8      - body('city', 'The supplier city is required').trim().isLength({min: 1}).escape(),
9      - body('state', 'The supplier state is required').trim().isLength({min: 1}).escape(),
10     - body('phone', 'Phone number should be 10 digit number plus optional country code').trim().isMobilePhone().escape(),
11     - // Process Request after validation and sanitization.
12     - (req, res, next) => {
13       -   // Extract the validation errors from a request.
14       -   const errors = validationResult(req);
15       -   // Create a genre object with escaped and trimmed data.
16       -   const supplier = new Supplier(req.body);
17       -   if (!errors.isEmpty()) {
18         -     // There are errors. Render the form again with sanitized values/error messages.
19         -     res.render('supplier-add', {title: 'Create Genre', supplier: supplier, errors: errors.array()});
20       } else {
21         -     // Data from form is valid., save to db
22         -     supplier.create(supplier, (err, data) => {
23           -       if (err)
24             -         res.render("500", {message: "Error occurred while creating the Supplier."});
25           -       else res.redirect("/suppliers");
26           -     });
27         -   }
28       - }
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```

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customer/app/models/supplier.model.js

```
@@ -18,17 +18,7 @@
  database: dbConfig.APP_DB_NAME
});
-
Supplier.create = (newSupplier, result) => {
  db_connection.query("INSERT INTO suppliers SET ?", newSupplier, (err, res) => {
    if (err) {
      console.log("error: ", err);
      result(err, null);
      return;
    }
    console.log("created supplier: ", {id: res.insertId, ...newSupplier});
    result(null, {id: res.insertId, ...newSupplier});
  });
}
-
Supplier.getAll = result => {
  db_connection.query("SELECT * FROM suppliers", (err, res) => {
    if (err) {
      console.log("error: ", err);
      result(err, null);
      return;
    }
    result(null, {id: id, ...supplier});
  });
}
-
Supplier.updateById = (id, supplier, result) => {
  db_connection.query(
    "UPDATE suppliers SET ? WHERE id = ?",
    [Object.assign({id: id}, supplier), id],
    (err, res) => {
      if (err) {
        console.log("error: ", err);
        result(err, null);
        return;
      }
      if (res.affectedRows === 0) {
        result({kind: "not_found"}, null);
        return;
      }
      console.log("updated supplier: ", {id: id, ...supplier});
      result(null, {id: id, ...supplier});
    }
  );
}
-
Supplier.delete = (id, result) => {
  db_connection.query("DELETE FROM suppliers WHERE id = ?", id, (err, res) => {
    if (err) {
      console.log("error: ", err);
      result(err, null);
      return;
    }
    if (res.affectedRows === 0) {
      result({kind: "not_found"}, null);
      return;
    }
    console.log("deleted supplier with id: ", id);
    result(null, res);
  });
}
-
Supplier.removeAll = result => {
  db_connection.query("DELETE FROM suppliers", (err, res) => {
    if (err) {
      console.log("error: ", err);
      result(err, null);
      return;
    }
    console.log(`deleted ${res.affectedRows} suppliers`);
    result(null, res);
  });
}
-
module.exports = supplier;
```

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customer/index.js

```
@@ -24,17 +24,17 @@
);
app.get("/suppliers/", supplier.findAll);
// show the add supplier form
app.get("/supplier-add", (req, res) => {
  res.render("supplier-add", {});
});
// receive the add supplier POST
```

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customer/index.js

```
@@ -24,17 +24,17 @@
);
app.get("/suppliers/", supplier.findAll);
// show the add supplier form
app.get("/supplier-add", (req, res) => {
  res.render("supplier-add", {});
});
// receive the add supplier POST
```

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```

30      - // receive the add supplier POST
31      - app.post("/supplier-add", supplier.create);
32      - // show the update form
33      - app.get("/supplier-update/:id", supplier.findOne);
34      - // receive the update POST
35      - app.post("/supplier-update", supplier.update);
36      - // receive the POST to delete a supplier
37      - app.post("/supplier-remove/:id", supplier.remove);
38      + // app.get("/supplier-add", (req, res) => {
39      + //   res.render("supplier-add", {});
40      + // });
41      + // receive the add supplier POST
42      + // app.post("/supplier-add", supplier.create);
43      + // show the update form
44      + // app.get("/supplier-update/:id", supplier.findOne);
45      + // receive the update POST
46      + // app.post("/supplier-update", supplier.update);
47      + // receive the POST to delete a supplier
48      + // app.post("/supplier-remove/:id", supplier.remove);
49      // handle 404
50      app.use(function (req, res, next) {
51        res.status(404).render("404", {});
52      });
53      @@ -42,7 +42,7 @@
54      // set port, listen for requests
55      const app_port = process.env.APP_PORT || 80
56      + const app_port = process.env.APP_PORT || 8080
57      app.listen(app_port, () =>

```

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```

47      console.log(`Server is running on port ${app_port}.`);
48    });
EOF

```

**customer/views/nav.html**

Browse file contents Comment on file

```

1      <nav class="navbar navbar-expand-lg navbar-dark bg-dark">
2        
3        - <div><a href="/supplier">Monolithic Coffee suppliers</a></div>
4        + <div><a href="/supplier">Coffee suppliers</a></div>
5        <div class="collapse navbar-collapse" id="navbarSupportedContent">
6          <ul class="navbar-nav mr-auto">
7            - <li class="nav-item active">
8              <a class="nav-link" href="/">Home</a>
9            + <li class="nav-item active">
10               <a class="nav-link" href="/">>Customer home</a>
11             <a class="nav-link" href="/suppliers">>Suppliers list</a>
12             <a class="nav-link" href="/admin/suppliers">>Administrator link</a>
13           </li>
14         </ul>
15       </div>
16     ***
17

```

**customer/views/supplier-add.html** Deleted

Comment on file

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**customer/views/supplier-form-fields.html** Deleted

Comment on file

**customer/views/supplier-list-all.html**

Browse file contents Comment on file

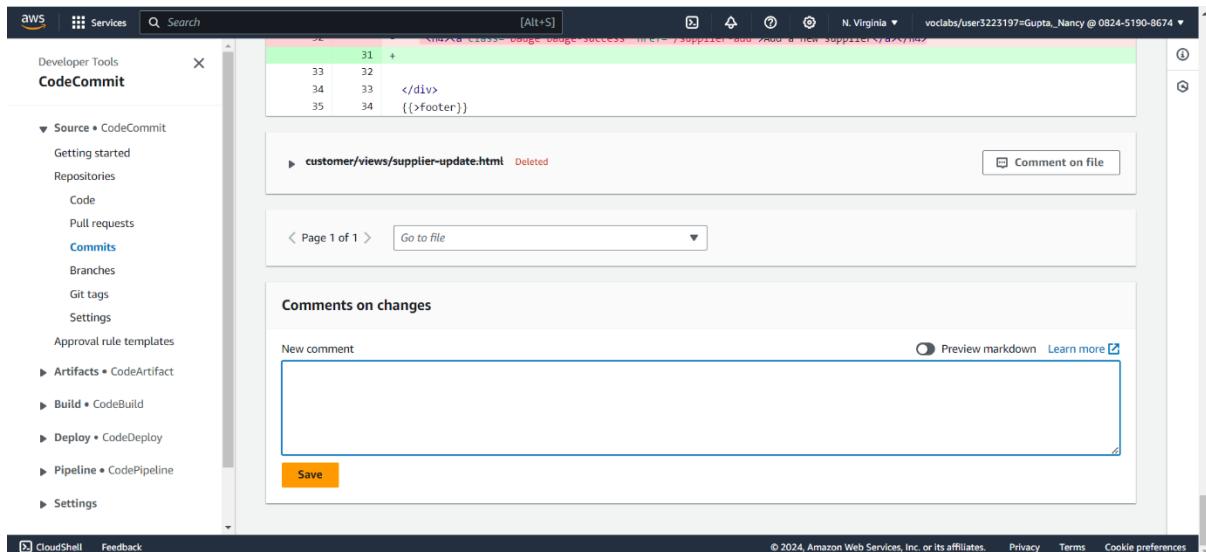
```

*** *** @@ -23,13 +23,12 @@
23      <td>{{state}}</td>
24      <td>{{email}}</td>
25      <td>{{phone}}</td>
26      - <td>xh><span class="badge badge-info"><a class="text-light" href="/supplier-update/({id})">edit</a></span></td>
27      +
28      </tr>
29      {{/suppliers}}
30      </tbody>
31      </table>
32      - <h4><a class="badge badge-success" href="/supplier-add">Add a new supplier</a></h4>
33      +
34      {{/footer}}
35

```

**customer/views/supplier-update.html** Deleted

Comment on file



#### Task 4.4: Modify the source code of the *employee* microservice

In this task, you will modify the source code for the *employee* microservice similarly to how you modified the code for the *customer* microservice. Customers (café franchise location managers) should have read-only access to the application data, but employees of the café corporate office should be able to add new entries or modify existing entries in the list of coffee suppliers.

As you will see later in this project, you will deploy the microservices behind an Application Load Balancer and route traffic to the microservices based on the path that is contained in the URL of the request. In this way, if the URL path includes /admin/, the load balancer will route the traffic to the *employee* microservice. Otherwise, if the URL path doesn't include /admin/, then the load balancer will route the traffic to the *customer* microservice.

Because of the need to route traffic, much of the work in this task is to configure the *employee* microservice to add /admin/ to the path of the pages that it serves.

#### 1. In the AWS Cloud9 IDE, return to the file view (toggletree view).

```

1 FROM node:11-alpine
2 RUN apk add --no-cache curl
3 WORKDIR /var/src/app
4 COPY . .
5 RUN npm install
6 EXPOSE 8080
7 CMD [ "npm", "run", "start" ]

```

```

bash -p 10.10.10.153.x | Immediate Javascript (br x)
Writing objects: 100% (13/13), 1.33 KiB | 681.00 KiB/s, done.
Total 13 (delta 6), reused 0 (delta 0), pack-reused 0
remote: Validating objects: 100%
To https://git-codecommit.us-east-1.amazonaws.com/v1/repos/microservices
  f3143dc...cb85e60 dev -> dev
branch 'dev' set up to track 'origin/dev'.
vocabs:-/environment/microservices/customer (dev) $ git status
On branch dev
Your branch is up to date with 'origin/dev'.

nothing to commit, working tree clean
vocabs:-/environment/microservices/customer (dev) $

```

#### 2. Collapse the customer directory, and then expand the employee directory.

```

FROM node:11-alpine
RUN mkdir -p /usr/src/app
WORKDIR /usr/src/app
COPY . .
RUN npm install
EXPOSE 8080
CMD ["npm", "run", "start"]

```

```

bash -cp 10-16-10-153.x  Immediato Javascript (br x ⓘ
Writing objects: 100% (13/13), 1.38 KB | 681.00 KB/s, done.
Total 13 (delta 0), reused 0 (delta 0), pack-reused 0
remote: Validation: objects: 100%
To https://gitpodgitpod.com/u/last-1.amazonaws.com/v1/repos/microservices
  F143dc...d8560 dev -> dev
branch 'dev' set up to track 'origin/dev'.
vocabs:-/environment/microservices/customer (dev) $ git status
On branch dev
Your branch is up to date with 'origin/dev'.
nothing to commit, working tree clean
vocabs:-/environment/microservices/customer (dev) $ 

```

### 3. In the employee/app/controller/supplier.controller.js file, for all the redirect calls, prepend /admin to the path.

```

const Supplier = require('../models/supplier.model.js');
const validationResult = require('express-validator');

exports.create = [
  // Validate and sanitize the name field.
  body('name', 'The supplier name is required').trim().isLength({min: 1}).escape(),
  body('address', 'The supplier address is required').trim().isLength({min: 1}).escape(),
  body('city', 'The supplier city is required').trim().isLength({min: 1}).escape(),
  body('state', 'The supplier state is required').trim().isLength({min: 1}).escape(),
  body('phone', 'Phone number should be 10 digit number plus optional country code').trim().isMobilePhone().escape(),
  // Process request after validation and sanitization.
  (req, res, next) => {
    const errors = validationResult(req);
    // Create a genre object with escaped and trimmed data.
    const supplier = new Supplier(req.body);
    if (!errors.isEmpty()) {
      // Render the form again with sanitized values/error messages.
      res.render('supplier-add', {title: 'Create Supplier', supplier, errors: errors.array()});
    } else {
      // Data from form is valid., save to db
      Supplier.create(supplier, (err, data) => {
        if (err)
          res.render("500", {message: "Error occurred while creating the Supplier."});
        else res.redirect('/suppliers');
      });
    }
  }
];
exports.findAll = (req, res) => {
  Supplier.getAll((err, data) => {
    if (err)
      res.render("500", {message: "There was a problem retrieving the list of suppliers"});
    else res.render("supplier-list-all", {suppliers: data});
  });
};


```

```

bash -cp 10-16-10-153.x  Immediato Javascript (br x ⓘ
nothing to commit, working tree clean
vocabs:-/environment/microservices/customer (dev) $ 

```

**Tip:** To find the three lines that need to be updated, run the following commands in the terminal:

```
cd ~/environment/microservices/employee
```

```
grep -n 'redirect' app/controller/supplier.controller.js
```

```
body('city', 'The supplier city is required').trim().isLength({min: 1}).escape(),
body('state', 'The supplier state is required').trim().isLength({min: 1}).escape(),
body('phone', 'Phone number should be 10 digit number plus optional country code').trim().isMobilePhone().escape(),
(req, res, next) => {
  // Process request after validation and sanitization.
  const errors = validationResult(req);
  // Create a genre object with escaped and trimmed data.
  const supplier = new Supplier(req.body);
  if (!errors.isEmpty()) {
    // Render the form again with sanitized values/error messages.
    res.render('supplier-add', {title: 'Create Supplier', supplier, errors: errors.array()});
  } else {
    // Data from form is valid., save to db
    Supplier.create(supplier, (err, data) => {
      if (err)
        res.render('500', {message: 'Error occurred while creating the Supplier.'});
      else res.redirect('/suppliers');
    });
  }
};

exports.findAll = (req, res) => {
  Supplier.getAll((err, data) => {
    if (err)
      res.render('500', {message: 'There was a problem retrieving the list of suppliers'});
    else res.render('supplier-list-all', {suppliers: data});
  });
};

exports.findOne = (req, res) => {
  Supplier.findById(req.params.id, (err, data) => {
    if (err)
      res.render('500', {message: 'There was a problem retrieving the supplier'});
    else res.render('supplier-single', {supplier: data});
  });
};
```

```
body('name', 'The supplier name is required').trim().isLength({min: 1}).escape(),
body('address', 'The supplier address is required').trim().isLength({min: 1}).escape(),
body('city', 'The supplier city is required').trim().isLength({min: 1}).escape(),
body('state', 'The supplier state is required').trim().isLength({min: 1}).escape(),
body('phone', 'Phone number should be 10 digit number plus optional country code').trim().isMobilePhone().escape(),
(req, res, next) => {
  // Process request after validation and sanitization.
  const errors = validationResult(req);
  // Create a genre object with escaped and trimmed data.
  const supplier = new Supplier(req.body);
  if (!errors.isEmpty()) {
    // Render the form again with sanitized values/error messages.
    res.render('supplier-add', {title: 'Create Supplier', supplier, errors: errors.array()});
  } else {
    // Data from form is valid., save to db
    Supplier.create(supplier, (err, data) => {
      if (err)
        res.render('500', {message: 'Error occurred while creating the Supplier.'});
      else res.redirect('/suppliers');
    });
  }
};

exports.findAll = (req, res) => {
  Supplier.getAll((err, data) => {
    if (err)
      res.render('500', {message: 'There was a problem retrieving the list of suppliers'});
    else res.render('supplier-list-all', {suppliers: data});
  });
};

exports.findOne = (req, res) => {
  Supplier.findById(req.params.id, (err, data) => {
    if (err)
      res.render('500', {message: 'There was a problem retrieving the supplier'});
    else res.render('supplier-single', {supplier: data});
  });
};
```

```
// Validate and sanitize the name field.
body('name', 'The supplier name is required').trim().isLength({min: 1}).escape(),
body('address', 'The supplier address is required').trim().isLength({min: 1}).escape(),
body('city', 'The supplier city is required').trim().isLength({min: 1}).escape(),
body('state', 'The supplier state is required').trim().isLength({min: 1}).escape(),
body('phone', 'Phone number should be 10 digit number plus optional country code').trim().isMobilePhone().escape(),
(req, res, next) => {
  // Process request after validation and sanitization.
  const errors = validationResult(req);
  // Create a genre object with escaped and trimmed data.
  const supplier = new Supplier(req.body);
  if (!errors.isEmpty()) {
    // Render the form again with sanitized values/error messages.
    res.render('supplier-add', {title: 'Create Supplier', supplier, errors: errors.array()});
  } else {
    // Data from form is valid., save to db
    Supplier.create(supplier, (err, data) => {
      if (err)
        res.render('500', {message: 'Error occurred while creating the Supplier.'});
      else res.redirect('/admin/suppliers');
    });
  }
};

exports.findAll = (req, res) => {
  Supplier.getAll((err, data) => {
    if (err)
      res.render('500', {message: 'There was a problem retrieving the list of suppliers'});
    else res.render('supplier-list-all', {suppliers: data});
  });
};

exports.findOne = (req, res) => {
  Supplier.findById(req.params.id, (err, data) => {
    if (err)
      res.render('500', {message: 'There was a problem retrieving the supplier'});
    else res.render('supplier-single', {supplier: data});
  });
};
```

```

 64     // Extract the validation errors from a request.
 65     const errors = validationResult(req);
 66     // Create a genre object with escaped and trimmed data.
 67     const supplier = new Supplier(req.body);
 68     supplier.name = trim(supplier.name);
 69     if (!supplier.name.isEmpty()) {
 70         // There are errors. Render the form again with sanitized values/error messages.
 71         res.render('supplier-update', {supplier: supplier, errors: errors.array()});
 72     } else {
 73         // Data from form is valid., save to db
 74         Supplier.updateById(
 75             req.body.id,
 76             supplier,
 77             (err, data) => {
 78                 if (err) {
 79                     if (err.kind === "not_found") {
 80                         res.status(404).send({
 81                             message: 'Supplier with id ${req.body.id} Not found.'
 82                         });
 83                     } else {
 84                         res.render("500", {message: 'Error updating Supplier with id ${req.body.id}'});
 85                     }
 86                 } else res.redirect("/admin/suppliers");
 87             }
 88         );
 89     }
 90 }
 91 
```

bash - ip-10-16-10-153.e.x Immediate (Javascript (br x)

```

nothing to commit, working tree clean
vclabs:/environment/microservices/customer (dev) $ cd ~/environment/microservices/employee
vclabs:/environment/microservices/employee (dev) $ grep -n "redirect" app/controller/supplier.controller.js
25:         else res.redirect("/suppliers");
86:     ) else res.redirect("/suppliers");
103: } else res.redirect("/suppliers");
vclabs:/environment/microservices/employee (dev) $ 

```

```

 81         message: 'Supplier with id ${req.body.id} NOT found.'
 82     } else {
 83         res.render("500", {message: 'Error updating Supplier with id ${req.body.id}'});
 84     }
 85     } else res.redirect("/admin/suppliers");
 86 }
 87 
```

bash - ip-10-16-10-153.e.x Immediate (Javascript (br x)

```

nothing to commit, working tree clean
vclabs:/environment/microservices/customer (dev) $ cd ~/environment/microservices/employee
vclabs:/environment/microservices/employee (dev) $ grep -n "redirect" app/controller/supplier.controller.js
25:         else res.redirect("/suppliers");
86:     ) else res.redirect("/suppliers");
103: } else res.redirect("/suppliers");
vclabs:/environment/microservices/employee (dev) $ 

```

#### 4. In the employee/index.js file, update the `app.get` calls, `app.post` calls, and a port number.

```

 1 //const express = require('express');
 2 //const bodyParser = require('body-parser');
 3 const cors = require('cors');
 4 const supplier = require('./app/controller/supplier.controller');
 5 const app = express();
 6 const mustacheExpress = require('mustache-express');
 7 const favicon = require('serve-favicon');
 8
 9 // parse requests of content-type: application/json
10 app.use(bodyParser.json());
11 app.use(bodyParser.json({ type: 'application/x-www-form-urlencoded' }));
12 app.use(bodyParser.urlencoded({ extended: true }));
13 app.use(cors());
14 app.options('*', cors());
15 app.set('view engine', mustacheExpress())
16 app.set('views', __dirname + '/views')
17 app.set('view engine', 'html')
18 app.use(express.static('public'));
19 app.use(favicon(__dirname + '/public/img/favicon.ico'));
20
21 // list all the suppliers
22 app.get('/', (req, res) => {
23     res.render('home', {});
24 });
25 app.get('/suppliers', supplier.findAll);
26 // show the add supplier form
27 app.get('/supplier-add', (req, res) => {
28     res.render('supplier-add', {});
29 });

  bash - ip-10-16-10-153.e.x Immediate (Javascript (br x)
  ...
  Your branch is up to date with 'origin/dev'.

nothing to commit, working tree clean
vclabs:/environment/microservices/customer (dev) $ cd ~/environment/microservices/employee
vclabs:/environment/microservices/employee (dev) $ grep -n "redirect" app/controller/supplier.controller.js
25:         else res.redirect("/suppliers");
86:     ) else res.redirect("/suppliers");
103: } else res.redirect("/suppliers");
vclabs:/environment/microservices/employee (dev) $ 

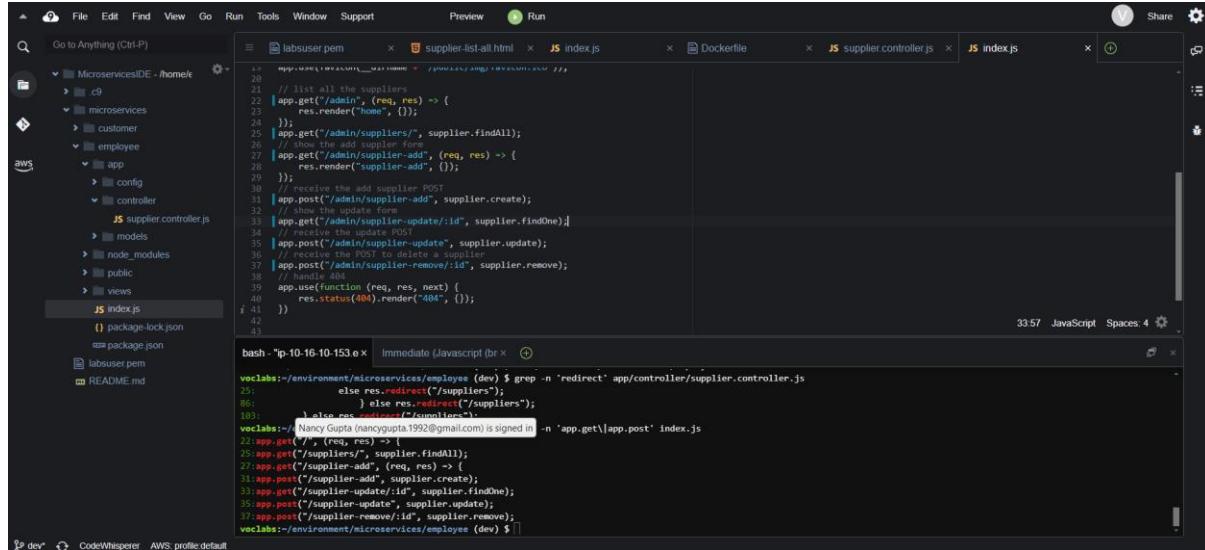
```

- For all `app.get` and `app.post` calls, prepend `/admin` to the first parameter.

**Tip: To find the seven lines that need to be updated, run the following command in the terminal:**

```
grep -n 'app.get\|app.post' index.js
```

**Important: After you edit line 22, the path should be /admin, not /admin/**



```
// list all the suppliers
22 | app.get('/admin', (req, res) => {
23 |   res.render('home', {});
24 | });
25 | app.get('/admin/suppliers', supplier.findAll);
26 | // show the add supplier form
27 | app.get('/admin/supplier-add', (req, res) => {
28 |   res.render('supplier-add', {});
29 | });
30 | // receive the add supplier POST
31 | app.post('/admin/supplier-add', supplier.create);
32 | // show the update form
33 | app.get('/admin/supplier-update/:id', supplier.findOne);
34 | // receive the POST
35 | app.post('/admin/supplier-update', supplier.update);
36 | // receive the POST to delete a supplier
37 | app.post('/admin/supplier-remove/:id', supplier.remove);
38 | app.use(function (req, res, next) {
39 |   res.status(404).render('404', {});
40 | })
41 |
42 |
43 |
44 | // set port, listen for requests
45 | const app_port = process.env.APP_PORT || 8081;
46 | app.listen(app_port, () => {
47 |   console.log(`Server is running on port ${app_port}.`);
48 | });

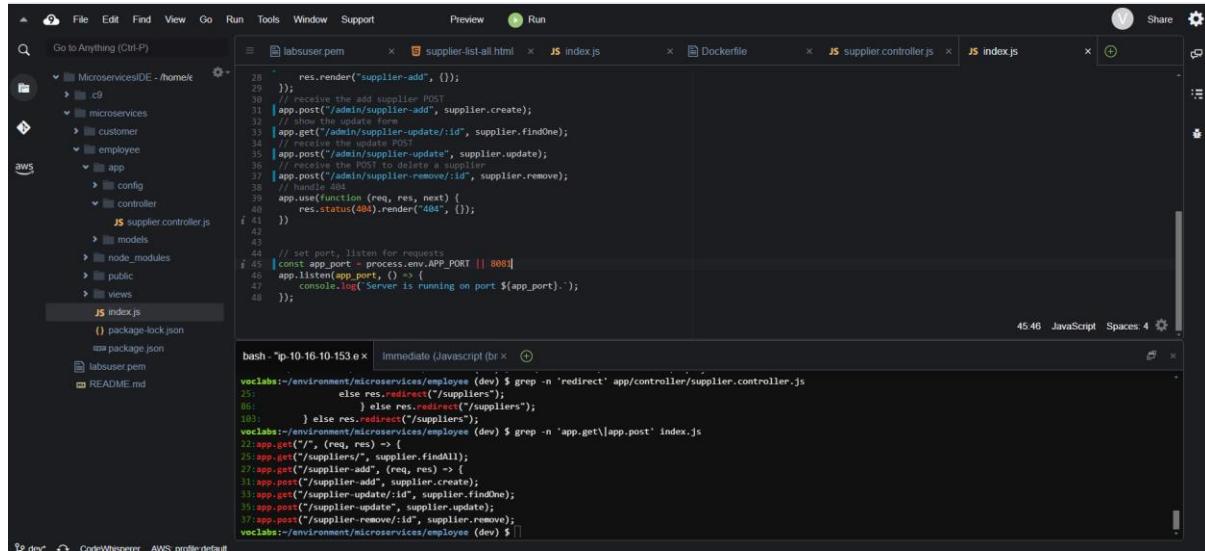
bash - *p-10-16-10-153 ex | Immediate (Javascript (br x)
```

```
veclabs:-/environment/microservices/employee (dev) $ grep -n 'redirect' app/controller/supplier.controller.js
29:           else res.redirect('/suppliers');
30:     } else res.redirect('/suppliers');
31:   }
32: }

veclabs:- Nancy Gupta (nancygupta1992@gmail.com) is signed in -n 'app.get\|app.post' index.js
22 app.get('/', (req, res) => {
23 app.get('/suppliers', supplier.findAll);
24 app.get('/supplier-add', (req, res) => {
25 app.post('/supplier-add', supplier.create);
33 app.get('/supplier-update/:id', supplier.findOne);
35 app.post('/supplier-update', supplier.update);
37 app.post('/supplier-remove/:id', supplier.remove);
veclabs:-/environment/microservices/employee (dev) $
```

- On line 45, change the port number to 8081

**Note:** When you run both the customer and employee microservice containers on the AWS Cloud9 instance as a test, they will need to use different port numbers so that they won't conflict with each other.



```
res.render('supplier-add', {});
30 | // receive the add supplier POST
31 | app.post('/admin/supplier-add', supplier.create);
32 | // receive the update POST
33 | app.get('/admin/supplier-update/:id', supplier.findOne);
34 | // receive the POST to delete a supplier
35 | app.post('/admin/supplier-remove/:id', supplier.remove);
38 | // handle 404
39 | app.use(function (req, res, next) {
40 |   res.status(404).render('404', {});
41 |
42 |
43 |
44 | // set port, listen for requests
45 | const app_port = process.env.APP_PORT || 8081;
46 | app.listen(app_port, () => {
47 |   console.log(`Server is running on port ${app_port}.`);
48 | });

bash - *p-10-16-10-153 ex | Immediate (Javascript (br x)
```

```
veclabs:-/environment/microservices/employee (dev) $ grep -n 'redirect' app/controller/supplier.controller.js
29:           else res.redirect('/suppliers');
30:     } else res.redirect('/suppliers');
31:   }
32: }

veclabs:- Nancy Gupta (nancygupta1992@gmail.com) is signed in -n 'app.get\|app.post' index.js
22 app.get('/', (req, res) => {
23 app.get('/suppliers', supplier.findAll);
24 app.get('/supplier-add', (req, res) => {
31 app.post('/supplier-add', supplier.create);
33 app.get('/supplier-update/:id', supplier.findOne);
35 app.post('/supplier-update', supplier.update);
37 app.post('/supplier-remove/:id', supplier.remove);
veclabs:-/environment/microservices/employee (dev) $
```

5. In the employee/views/supplier-add.html and employee/views/supplier-update.html files, for the form action paths, prepend /admin to the path.

The screenshot shows a browser-based development environment with multiple tabs and panels. The left sidebar lists project files and folders:

- microservices
- customer
- employee
- app
- config
- controller
  - JS supplier.controller.js
- models
- node\_modules
- Public
- views
  - 404.html
  - 500.html
  - footer.html
  - header.html
  - home.html
  - nav.html
  - supplier-add.html
  - supplier-form-fields.html
  - supplier-list-all.html
  - supplier-update.html

The main editor area displays the content of `supplier.controller.js`:

```
1  (>header)
2  <div class="container">
3  <!-- (snip) -->
4  <div class="mt-2">
5    (>errors)
6    <div class="alert alert-warning" role="alert">
7      ((msg))
8      </div>
9    (>errors)
10   </div>
11   <form action="/supplier-add" method="POST">
12     (>supplier-form-fields)
13     <button type="submit" class="btn btn-primary">Submit</button>
14   </form>
15 
16 </div>
17 (>footer)
18 
```

The bottom panel shows a terminal window with the following command and output:

```
bash -~ip-10-16-10-153.e x Immediate (Javascript (br x)
```

```
voelabs:~/environment/microservices/employees (dev) $ grep -n 'redirect' app/controller/supplier.controller.js
25:           else res.redirect('/suppliers');
26:         } else res.redirect('/suppliers');
27:       } else res.redirect('/suppliers');
28:     }
29:   }
30: }
31: voelabs:~/environment/microservices/employees (dev) $ grep -n 'app.get|app.post' index.js
32: app.get('/', (req, res) =>
33:   app.get('/supplier', supplier.findAll);
34:   app.get('/supplier/:id', (req, res) => {
35:     app.get('/supplier-add', supplier.create);
36:     app.get('/supplier-update/:id', supplier.findOne);
37:     app.post('/supplier-update/:id', supplier.update);
38:     app.post('/supplier-remove/:id', supplier.remove);
39:   });
40: voelabs:~/environment/microservices/employees (dev) $ 
```

**Tip:** To find the three lines that need to be updated in the two files, run the following command in the terminal:

```
grep -n 'action' views/*
```

File Edit Find View Go Run Tools Window Support Preview Run

Go to Anything (Ctrl-P)

microservices  
customer  
employee  
app  
config  
controller  
supplier.controller.js  
models  
node\_modules  
public  
views  
404.html  
500.html  
footer.html  
header.html  
home.html  
nav.html  
supplier-add.html  
supplier-form-fields.html  
supplier-list-all.html  
supplier-update.html  
index.js  
(-) package-lock.json  
package.json  
labuser.pem  
README.md

```
1  [{>header}]
2  <div class="container">
3    (>nav)
4    <div class="row">
5      (>div)
6        <div class="alert alert-warning" role="alert">
7          {{msg}}
8        </div>
9        (>errors)
10       </div>
11       <form action="/supplier-add" method="POST">
12         {{>supplier-form-fields}}
13         <button type="submit" class="btn btn-primary">Submit</button>
14       </form>
15
16     </div>
17   (>footer)
18
```

1:1 HTML Spaces 4

```
bash -i p-10-16-10-153.e x Immediate Javascript (br x +)
```

```
volcabs:>/environment/microservices/employees (dev) $ grep -n 'app.get|app.post' index.js
22 app.get("/", (req, res) => {
25 app.get("/suppliers", supplier.findAll);
29 app.get("/supplier-add", (req, res) => {
31 app.post("/supplier-add", supplier.create);
33 app.get("/supplier-update/", supplier.findOne);
35 app.get("/supplier-update/:id", supplier.update);
37 app.get("/supplier-remove/:id", supplier.remove);
39 app.post("/supplier-remove/:id", supplier.remove);
volcabs:>/environment/microservices/employees (dev) $ grep -n 'action' views/*
views/supplier-add.html:11:  <form action="/supplier-add" method="POST">
views/supplier-update.html:12:  <form action="/supplier-update" method="POST">
views/supplier-update.html:38:  <form action="/supplier-remove/{{id}}" method="POST">
volcabs:>/environment/microservices/employees (dev) $ |
```

The screenshot shows a terminal window integrated with a code editor. The top navigation bar includes File, Edit, Find, View, Go, Run, Tools, Window, Support, Preview, and Run. A Share icon is in the top right. The main area has tabs for 'labuser.pem', 'supplier-list-all.html', 'index.js', 'Dockerfile', 'supplier.controller.js', 'index.js', 'supplier-add.htm', and 'supplier-update.htm'. On the left is a file tree for 'microservices' containing 'customer', 'employee', 'app', 'config', 'controller', 'supplier.controller.js', 'models', 'node\_modules', 'public', and 'views' (with files 404.html, 500.html, footer.html, header.html, home.html, nav.html, supplier-add.html, supplier-form-fields.html, supplier-list-all.html, and supplier-update.html). The bottom half of the screen shows a terminal session with commands like 'grep -n "app.get" index.js', 'grep -n "action" views/\*', and 'grep -n "POST" views/\*'. The status bar at the bottom indicates '13:30 HTML Spaces 4'.

The screenshot shows a developer's terminal interface with several windows open:

- File Explorer:** Shows the project structure for "microservices".
- Code Editor:** The file "supplier-update.html" is open, displaying the following code:

```
<!-- Main Layout -->
<div>
  <div>{{msg}}</div>
  <div>{{errors}}</div>
</div>
<div>{{supplier}}</div>
<form action="/admin/supplier-update" method="POST">
  <input type="hidden" id="id" name="id" value="{{id}}"/>
  {{>supplier-form-fields}}
  <button type="submit" class="btn btn-primary">Submit</button>
</form>
<br>
<!-- Button trigger modal -->
<button type="button" class="float-right btn btn-danger" data-toggle="modal" data-target="#exampleModal">
  Delete this supplier
</button>
<br>
<!-- Modal -->
<div class="modal fade" id="exampleModal" tabindex="-1" role="dialog" aria-labelledby="exampleModalLabel" aria-hidden="true">
  <div class="modal-dialog" role="document">
    <div class="modal-content">
      <div class="modal-header">
        <h5 class="modal-title" id="exampleModalLabel">Delete supplier</h5>
        <button type="button" class="close" data-dismiss="modal" aria-label="Close">
          <span aria-hidden="true">&amptimes</span>
        </button>
      </div>
      <div class="modal-body">
        Are you sure you want to delete this supplier?
      </div>
      <div class="modal-footer">
        <button type="button" class="btn btn-secondary" data-dismiss="modal" aria-label="Close">
          <span aria-hidden="true">&amptimes</span>
        </button>
        <button type="button" class="btn btn-primary">Delete</button>
      </div>
    </div>
  </div>
</div>
```

**Terminal:** The command `bash -c 'curl -X POST http://10.16.10.153:8080/admin/supplier-update?id=1'` is being run.

**Status Bar:** 1363 HTML, Spaces: 4

The screenshot shows a browser-based code editor with multiple tabs open. The active tab contains the following code:

```
17 <!-- Button trigger modal -->
18 <button type="button" class="float-right btn btn-danger" data-toggle="modal" data-target="#exampleModal">
19   Delete this supplier
20 </button>
21
22 <!-- Modal -->
23 <div class="modal fade" id="exampleModal" tabindex="-1" role="dialog" aria-labelledby="exampleModalLabel" aria-hidden="true">
24   <div class="modal-dialog" role="document">
25     <div class="modal-content">
26       <div class="modal-header">
27         <h5 class="modal-title" id="exampleModalLabel">Delete supplier</h5>
28         <button type="button" class="close" data-dismiss="modal" aria-label="Close">
29           <span aria-hidden="true">&amptimes</span>
30         </button>
31       </div>
32       <div class="modal-body">
33         Are you sure you want to delete supplier {{name}}?
34       </div>
35       <div class="modal-footer">
36         <button type="button" class="btn btn-secondary" data-dismiss="modal">Close</button>
37         <form action="/admin/supplier-remove/{{id}}/" method="POST">
38           <button type="submit" class="float-right btn btn-danger">Delete this supplier</button>
39         </form>
40       </div>
41     </div>
42   </div>
43 </div>
```

Below the code editor, a terminal window is open with the command `bash -i 10.10.10.153.0 x`. The terminal output shows the following code:

```
bash -i 10.10.10.153.0 x immediate (Javascript(br x) ⌂
vocebas:/~environment/microservices/employees (dev) $ grep -n 'app.get|app.post' index.js
22:app.get("/", (req, res) => {
25:app.get("/suppliers/", supplier.findall);
27:app.get("/supplier-add/", (req, res) => {
31:app.post("/supplier-add/", supplier.create);
33:app.get("/supplier-update/:id", supplier.findOne);
35:app.post("/supplier-update/", supplier.update);
37:app.post("/supplier-remove/:id", supplier.remove);
vocebas:/~environment/microservices/employees (dev) $ grep -n 'action' views/*
views/supplier-add.html:12 <form action="/supplier-add" method="POST">
views/supplier-update.html:12 <form action="/supplier-update" method="POST">
views/supplier-remove.html:38 <form action="/supplier-remove/{{id}}/" method="POST">
vocebas:/~environment/microservices/employees (dev) $
```

6. In the employee/views/supplier-list-all.html and employee/views/home.html files, for the HTML paths, prepend /admin to the path.

**Tip:** To find the three lines that need to be updated in the two files, run the following command in the terminal:

```
grep -n 'href' views/supplier-list-all.html views/home.html
```

File Edit Find View Go Run Tools Window Support Preview Run

Go to Anything (Ctrl-P)

```

1  {{>header}}
2  <div class="container">
3    (>nav)
4    <h1>All Suppliers</h1>
5    <table class="table table-hover">
6      <thead>
7        <tr>
8          <th scope="col">Name</th>
9          <th scope="col">Address</th>
10         <th scope="col">City</th>
11         <th scope="col">State</th>
12         <th scope="col">Email</th>
13         <th scope="col">Phone</th>
14         <th scope="col"></th>
15       </tr>
16     </thead>
17     <tbody>
18       {{>suppliers}}
19         <tr>
20           <th scope="row">{{name}}</th>
21           <td>{{address}}</td>
22           <td>{{city}}</td>
23           <td>{{state}}</td>
24           <td>{{email}}</td>
25           <td>{{phone}}</td>
26           <td><a href="#">Edit</a></td>
27         </tr>
28       {{/suppliers}}
29     </tbody>
30   </table>
31   <div><a class="badge badge-success" href="/supplier-add">Add a new supplier</a></div>
32   {{>footer}}
33
34 </div>
35 {{>footer}}
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```

Screenshot of the AWS Lambda Code Editor showing the `supplier-list-all.html` file. The file contains an HTML table for listing suppliers, with a success message at the bottom.

```

<thead>
    <tr>
        <th scope="col"></th>
        <th>Name</th>
        <th>Address</th>
        <th>City</th>
        <th>State</th>
        <th>Phone</th>
    </tr>
</thead>
<tbody>
    {{#suppliers}}
        <tr>
            <td>{{name}}</td>
            <td>{{address}}</td>
            <td>{{city}}</td>
            <td>{{state}}</td>
            <td>{{phone}}</td>
            <td><span class="badge badge-info"><a href="/admin/supplier-update/{{id}}">edit</a></span></td>
        </tr>
    {{/suppliers}}
</tbody>
</table>
<div><a class="badge badge-success" href="/admin/supplier-add">Add a new supplier</a></div>

```

Screenshot of the AWS Lambda Code Editor showing the `home.html` file. It includes a header with a link to the supplier list and a footer with a link to the supplier add page.

```

<div><a href="/supplier-list-all">List of suppliers</a></div>

```

## 7. In the employee/views/header.html file, modify the title to be Manage coffee suppliers

Screenshot of the AWS Lambda Code Editor showing the `header.html` file. The title is modified to "Manage coffee suppliers".

```

<title>Manage coffee suppliers</title>

```

The screenshot shows a browser window with several tabs open. The tabs include 'labuser.pem', 'supplier-list-all.html', 'home.html', and 'header.html'. The 'header.html' tab is active, displaying the following code:

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <link rel="stylesheet" href="/css/bootstrap.min.css">
    <link rel="stylesheet" href="/css/base.css">
    <title>Manage coffee suppliers</title>
</head>
<body>
```

On the left side of the screen, there is a sidebar titled 'Go to Anything (Ctrl-P)' which lists various project files and folders. Some of the visible files are 'supplier controller.js', 'models', 'public', and 'views' (containing '404.html', '500.html', 'footer.html', 'header.html', 'home.html', 'nav.html', 'supplier-add.html', 'supplier-form-fields.html', 'supplier-list-all.html', 'supplier-update.html').

At the bottom of the screen, there is a terminal window showing the command: `bash -c pkill -f node & node app.js`. The terminal also displays some log output related to the AWS Lambda function.

#### **8. Edit the employee/views/nav.html file.**

The screenshot shows the AWS Cloud9 IDE interface. On the left, a file browser lists files and folders under 'microservices'. The 'controller' folder contains 'supplier.controller.js'. The 'views' folder contains several HTML files: '404.html', '500.html', 'footer.html', 'header.html', 'home.html', 'nav.html', 'supplier-add.html', 'supplier-form-fields.html', 'supplier-list-all.html', 'supplier-update.html', and 'supplier-update-id.html'. The 'public' folder contains 'index.js', 'package.json', and 'README.md'. The 'aws' folder is also present. The main workspace has two tabs open: 'labsuser.pem' and 'nav.html'. The 'nav.html' tab displays the following code:

```
1 <nav> class="navbar navbar-expand-lg navbar-dark bg-dark">
2   
3   <div> class="navbar-brand page-title" href="/supplier">Monolithic Coffee suppliers</a></div>
4   <div> class="collapse navbar-collapse" id="navbarSupportedContent">
5     <ul> class="navbar-nav mr-auto">
6       <li> class="nav-item active">
7         <a class="nav-link" href="/">Home</a>
8       <li> class="nav-item active">
9         <a class="nav-link" href="/suppliers">Suppliers list</a>
10      </li>
11    </ul>
12  </div>
```

The bottom right corner shows the status bar with '1.1 HTML Spaces 4'. A terminal window is open with the command 'bash -p 10-16-10-153 x' and the output:

```
bash -p 10-16-10-153 x | Immediate Javascript (br x) ⓘ
25 app.get("/suppliers/", supplier.findAll);
27 app.get("/supplier-add", (req, res) -> {
31   app.post("/supplier-add", supplier.create);
33 app.get("/supplier-update/:id", supplier.findOne);
35 app.post("/supplier-update", supplier.update);
37 app.post("/supplier-remove/:id", supplier.remove);
vocles:~/environment/microservices/employees (dev) $ grep -n 'action' views/*
views/supplier-add.html:11:  <form action="/supplier-add" method="POST">
views/supplier-update.html:12:  <form action="/supplier-update" method="POST">
views/supplier-remove.html:13:  <form action="/supplier-remove/(:id)" method="POST">
vocles:~/environment/microservices/employees (dev) $ grep -n 'href' views/supplier-list-all.html views/home.html
views/supplier-list-all.html:27:  <a href="/supplier-add">Add a new supplier</a></span></td>
views/supplier-list-all.html:32:  <div><a href="/suppliers">List of suppliers</a></p>
vocles:~/environment/microservices/employees (dev) $ |
```

- **On line 3, change Monolithic Coffee suppliers to Manage coffee suppliers**
  - **On line 7, replace the existing line of code with the following:**

[Administrator home](/admin/suppliers)

**Note:** Both the href value and the name of the link are modified in the new line.

- Add a new line *after* line 8 that contains the following HTML:

**Important:** DON'T delete or overwrite any of the existing lines in the file.

```
<a class="nav-link" href="/">Customer home</a>
```

**Analysis:** Later in the project, when you deploy the microservices behind an Application Load Balancer, you will want employees to be able to navigate from the admin pages back to the customer area of the web application. Adding this link provides a navigation path for employees to the pages that will be hosted by the *customer* microservice under the / URL path.

- Save the changes.

The screenshot shows the AWS Lambda Functions IDE interface. On the left, the file tree displays the project structure under 'aws' with files like 'supplier\_controller.js', 'nav.html', 'index.js', and 'Dockerfile'. The main editor window shows the 'nav.html' file content:

```

<nav class="navbar navbar-expand-lg navbar-dark bg-dark">
  
  <div><a href="#">Manage coffee suppliers</a></div>
  <div class="collapse navbar-collapse" id="navbarSupportedContent">
    <ul class="navbar-nav me-auto">
      <li class="nav-item active">
        <a class="nav-link" href="/admin/suppliers">Administrator home</a>
      <li class="nav-item">
        <a class="nav-link" href="/suppliers">Suppliers list</a>
      <li class="nav-item">
        <a class="nav-link" href="#">Customer home</a>
      </li>
    </ul>
  </div>

```

Below the editor, a terminal window shows the command 'bash - ip-10-16-10-153.e.x' and its output, which includes parts of the 'supplier\_controller.js' file and some AWS-specific logs.

### Task 4.5: Create the *employee* microservice Dockerfile and launch a test container

In this task, you will create a Docker image for the *employee* microservice. Then, you will launch a test container from the image and verify that the microservice works as expected.

#### 1. Create a Dockerfile for the *employee* microservice.

- Duplicate the Dockerfile from the *customer* microservice into the *employee* microservice area.

The screenshot shows the AWS Lambda Functions IDE interface. The file tree on the left shows the 'Dockerfile' under the 'employee' directory. The main editor window shows the Dockerfile content:

```

FROM node:11-alpine
RUN mkdir -p /usr/src/app
WORKDIR /usr/src/app
RUN npm install
EXPOSE 8888
CMD [ "npm", "run", "start" ]

```

Below the editor, a terminal window shows the command 'bash - ip-10-16-10-153.e.x' and its output, which includes parts of the 'supplier\_controller.js' file and some AWS-specific logs.

- Edit the employee/Dockerfile to change the port number on the EXPOSE line to 8081

```

FROM node:11-alpine
RUN mkdir -p /usr/src/app
WORKDIR /usr/src/app
COPY . .
RUN npm install
EXPOSE 8081
CMD ["npm", "run", "start"]

```

## 2. Build the Docker image for the *employee* microservice. Specify employee as the tag.

Use the command `docker build --tag employee` .

```

FROM node:11-alpine
RUN mkdir -p /usr/src/app
WORKDIR /usr/src/app
COPY . .
RUN npm install
EXPOSE 8081
CMD ["npm", "run", "start"]

```

## 3. Run a container named *employee\_1* based on the *employee* image. Run it on port 8081 and be sure to pass in the database endpoint.

To set a `dbEndpoint` variable in your terminal session, run the following commands:

```

dbEndpoint=$(cat ~environment/microservices/customer/app/config/config.js | grep 'APP_DB_HOST' | cut -d '"' -f2)

echo $dbEndpoint

```

```

FROM node:11-alpine
bash -t ip-10-16-10-131.e.x Welcome Dockerfile
Step 1/7 : FROM node:11-alpine
--> Using cache
--> 39f810949424
Step 2/7 : RUN mkdir -p /usr/src/app
--> Using cache
--> 39f810949424
Step 3/7 : WORKDIR /usr/src/app
--> Using cache
--> 49c20a04c28d
Step 4/7 : COPY . .
--> 49c20a04c28d
Step 5/7 : RUN npm install
--> Running in 5ff3cb1073b
npm WARN coffee_mq@1.0.0 No repository field.

audited 78 packages in 0.753s
found 10 vulnerabilities (5 moderate, 3 high, 2 critical)
  run 'npm audit fix' to fix them, or 'npm audit' for details
  run 'npm audit --force' to ignore them
Removing intermediate container 5ff3cb1073b
--> 666f5a884f61
Step 6/7 : EXPOSE 8081
--> Running in 676b001c5d98
Removing intermediate container 676b001c5d98
--> 666f5a884f61
Step 7/7 : CMD ["npm", "run", "start"]
--> Running in 18fe26dc061
Removing intermediate container 18fe26dc061
--> efed14973ae
Successfully built efed14973ae
Successfully tagged employee:latest

```

The terminal output shows the Dockerfile being built. It starts with `FROM node:11-alpine`, creates a directory at `/usr/src/app`, sets it as the working directory, copies the current directory contents into the container, installs npm dependencies, exposes port 8081, and runs the `start` script. The final step shows the container was successfully built and tagged as `employee:latest`.

Now use the following command to run the container

```
docker run -d --name employee_1 -p 8081:8081 -e APP_DB_HOST="$dbEndpoint" employee
```

```

FROM node:11-alpine
bash -t ip-10-16-10-131.e.x Dockerfile
Step 1/7 : FROM node:11-alpine
--> 39f810949424
Step 2/7 : RUN mkdir -p /usr/src/app
--> Using cache
--> 39f810949424
Step 3/7 : WORKDIR /usr/src/app
--> Using cache
--> 49c20a04c28d
Step 4/7 : COPY . .
--> 49c20a04c28d
Step 5/7 : RUN npm install
--> Running in 5ff3cb1073b
npm WARN coffee_mq@1.0.0 No repository field.

audited 78 packages in 0.753s
found 10 vulnerabilities (5 moderate, 3 high, 2 critical)
  run 'npm audit fix' to fix them, or 'npm audit' for details
  run 'npm audit --force' to ignore them
Removing intermediate container 5ff3cb1073b
--> 666f5a884f61
Step 6/7 : EXPOSE 8081
--> Running in 676b001c5d98
Removing intermediate container 676b001c5d98
--> 666f5a884f61
Step 7/7 : CMD ["npm", "run", "start"]
--> Running in 18fe26dc061
Removing intermediate container 18fe26dc061
--> efed14973ae
Successfully built efed14973ae
Successfully tagged employee:latest

```

The terminal output shows the Dockerfile being built. It starts with `FROM node:11-alpine`, creates a directory at `/usr/src/app`, sets it as the working directory, copies the current directory contents into the container, installs npm dependencies, exposes port 8081, and runs the `start` script. The final step shows the container was successfully built and tagged as `employee:latest`.

#### 4. Verify that the employee microservice is running in the container and that the microservice functions as intended.

I used the following command check which Docker containers are currently running on the AWS Cloud9 instance.

```
docker ps
```

```

File Edit Find View Go Run Tools Window Support Preview Run
Go to Anything (Ctrl+P)
MicroservicesIDE - /home/ec2-user
aws
└── microservices
    ├── customer
    ├── employee
    ├── app
    ├── node_modules
    ├── public
    └── views
        └── Dockerfile
            └── JS index.js
            └── package-lock.json
            └── package.json
labuser.pem
└── README.md

Welcome Dockerfile
FROM node:11-alpine
bash -c "node --version"
audit 78 packages in 0.753s
found 10 vulnerabilities (5 moderate, 3 high, 2 critical)
  run `npm audit fix` to fix them, or `npm audit` for details
Removing intermediate container 5ff3cbe1073b
--> 0b845bf6f99c
Step 7/7 : CMD ["npm", "run", "start"]
--> Running in 18fe26dc061
Removing intermediate container 18fe26dc061
--> efed14973ae
Successfully built efed14973ae
Successfully tagged employee:latest
voclabs:/environment/microservices/employee (dev) $ docker run -d --name employee_1 -p 8081:8081 -e DB_ENDPOINT=<database_endpoint> employee
bash: database_endpoint: No such file or directory
voclabs:/environment/microservices/employee (dev) $ docker run -d --name employee_1 -p 8081:8081 -e APP_DB_HOST=$dbEndpoint employee
122948539ee0@ec2-70-22-115-44.us-east-1.compute.amazonaws.com
voclabs:/environment/microservices/employee (dev) $ dbEndpoint=$(cat ~/environment/microservices/customer/app/config/config.js | grep 'APP_DB_HOST' | cut -d '"' -f2)
voclabs:/environment/microservices/employee (dev) $ echo $dbEndpoint
supplieRds.joudghyvct.us-east-1.rds.amazonaws.com
voclabs:/environment/microservices/employee (dev) $ docker run -d --name employee_1 -p 8081:8081 -e APP_DB_HOST=$dbEndpoint employee
docker: Error response from daemon: Conflict. The container name "employee_1" is already in use by container "122948539ee0@ec2-70-22-115-44.us-east-1.compute.amazonaws.com".
You have to remove (or rename) that container to be able to reuse that name.
See 'docker run --help'.
voclabs:/environment/microservices/employee (dev) $ docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
122948539ee0 employee "docker-entrypoint.s..." 4 minutes ago Up 4 minutes 0.0.0.0:8081->8081/tcp, ::0:8081->8081/tcp employee_1
9e4a3d14a78 customer "docker-entrypoint.s..." 34 minutes ago Up 34 minutes 0.0.0.0:8080->8080/tcp, ::0:8080->8080/tcp customer_1
voclabs:/environment/microservices/employee (dev) $ 

```

- Load the microservice web page in a new browser tab at <http://<cloud9-public-ip-address>:8081/admin/suppliers>

**Instances (1/2) info**

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS
MonolithicApp...	i-0a1861b7fa6d1ac29	Running	t2.micro	2/2 checks passed	View alarms +	us-east-1a	ec2-52-90-250-9
aws-cloud9-Mi...	i-0fd5c889af3b1eb2	Running	t3.small	2/2 checks passed	View alarms +	us-east-1a	ec2-34-229-96-8

**i-0fd5c889af3b1eb2 (aws-cloud9-MicroservicesIDE-84d2e6fedab4a0b8214113159ea5acf)**

**Details** Status and alarms New Monitoring Security Networking Storage Tags

**Instance summary**

Instance ID	Public IPv4 address	Private IPv4 addresses
i-0fd5c889af3b1eb2 (aws-cloud9-MicroservicesIDE-84d2e6fedab4a0b8214113159ea5acf)	34.229.96.82 [open address]	10.16.10.153
IPv6 address	Instance state	Public IPv4 DNS
-	Running	ec2-34-229-96-82.compute-1.amazonaws.com [open address]
Hostname type	Private IP DNS name (IPv4 only)	
IP name: ip-10-16-10-153.ec2.internal	ip-10-16-10-153.ec2.internal	

CloudShell Feedback

http://34.229.96.82:8081/admin/suppliers

Brave Search

The application should load.

- Verify that this view shows buttons to edit existing suppliers and to add a new supplier.

The screenshot shows a web browser window with the URL [34.229.96.82:8081/admin/suppliers](http://34.229.96.82:8081/admin/suppliers). The page title is "Manage coffee suppliers". On the left, there's a small image of two cups of coffee on a espresso machine. On the right, there are navigation links: "Administrator home", "Suppliers list", and "Customer home". Below the title, the heading "All suppliers" is displayed. A table lists one supplier: "Nancy\_Supplier1" with address "1 Castle Point Terrace", city "Hoboken", state "New Jersey", email "ngupta19@stevens.edu", and phone "5512098571". A green "edit" button is next to the phone number. At the bottom, a green "Add a new supplier" button is visible.

**Note:** Links that should take you to the *customer* microservice will not work. For example, if you choose Customer home or Suppliers list, the pages won't be found because the link assumes that the *customer* microservice also runs on port 8081 (but it doesn't). You can ignore this issue—these links should work as intended when you deploy the microservices to Amazon ECS later.

- Test adding a new supplier.

Verify that the new supplier appears on the suppliers page.

This screenshot is identical to the one above, showing the "Manage coffee suppliers" page with the same supplier listed and the "Add a new supplier" button.

The screenshot shows the "supplier-add" form. At the top, the title "Manage coffee suppliers" is displayed. Below it, a blue banner says "All fields are required". The form has several input fields:

- Name: "John" (with placeholder "Name of this supplier")
- Address: "23 River Dr" (with placeholder "Address for this supplier")
- City: "Hoboken" (with placeholder "City for this supplier")
- State: "New Jersey" (with placeholder "State for this supplier")

Not secure | 34.229.96.82:8081/admin/supplier-add

Careers GitHub - StevensDe... Eligible CIP Codes f... Applying for OPT S... STEM OPT Extension... CPT Work Authoriz... CPT Frequently Asked... Computer Architect... Cisco Skills For All VPN Update All Bookmarks

Name  
John

Name of this supplier

Address  
23 River Dr

Address for this supplier

City  
Hoboken

City for this supplier

State  
New Jersey

State for this supplier

Email  
john21@gmail.com

Email for this supplier

Phone  
4598745632

Phone number for this supplier

**Submit**

Not secure | 34.229.96.82:8081/admin/suppliers

Careers GitHub - StevensDe... Eligible CIP Codes f... Applying for OPT S... STEM OPT Extension... CPT Work Authoriz... CPT Frequently Asked... Computer Architect... Cisco Skills For All VPN Update All Bookmarks



# Manage coffee suppliers

Administrator home Suppliers list Customer home

## All suppliers

Name	Address	City	State	Email	Phone	
Nancy_Supplier1	1 Castle Point Terrace	Hoboken	New Jersey	ngupta19@stevens.edu	5512098571	<b>edit</b>
John	23 River Dr	Hoboken	New Jersey	john21@gmail.com	4598745632	<b>edit</b>

**Add a new supplier**

- **Test editing an existing supplier.**

Verify that the edited supplier information appears on the suppliers page.

Not secure | 34.229.96.82:8081/admin/suppliers

Careers GitHub - StevensDe... Eligible CIP Codes f... Applying for OPT S... STEM OPT Extension... CPT Work Authoriz... CPT Frequently Asked... Computer Architect... Cisco Skills For All VPN Update All Bookmarks



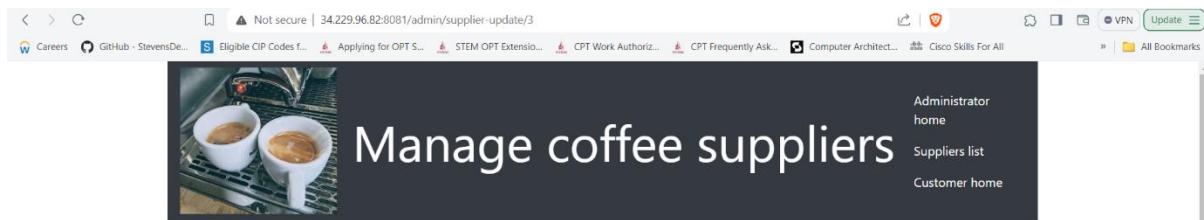
# Manage coffee suppliers

Administrator home Suppliers list Customer home

## All suppliers

Name	Address	City	State	Email	Phone	
Nancy_Supplier1	1 Castle Point Terrace	Hoboken	New Jersey	ngupta19@stevens.edu	5512098571	<b>edit</b>
John	23 River Dr	Hoboken	New Jersey	john21@gmail.com	4598745632	<b>edit</b>

**Add a new supplier**



All fields are required

Name

David

Name of this supplier

Address

561 River Dr

Address for this supplier

City

Long Island

City for this supplier

State

New York

State for this supplier

Email

davidsmith@gmail.com

Email for this supplier

Phone

7896541235

Phone number for this supplier

Submit

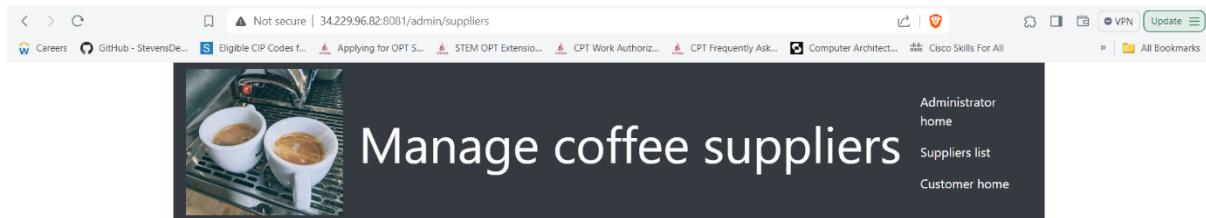
## All suppliers

Name	Address	City	State	Email	Phone	
Nancy_Supplier1	1 Castle Point Terrace	Hoboken	New Jersey	ngupta19@stevens.edu	5512098571	<a href="#">edit</a>
David	561 River Dr	Long Island	New York	davidsmith@gmail.com	7896541235	<a href="#">edit</a>

[Add a new supplier](#)

- **Test deleting an existing supplier:**

- On the row for a particular supplier entry, choose edit.



## All suppliers

Name	Address	City	State	Email	Phone
Nancy_Supplier1	1 Castle Point Terrace	Hoboken	New Jersey	ngupta19@stevens.edu	5512098571
David	561 River Dr	Long Island	New York	davidsmith@gmail.com	7896541235

[Add a new supplier](#)

- At the bottom of the page, choose Delete this supplier, and then choose Delete this supplier again.

A screenshot of a 'Supplier Update' form for 'David'. The form fields include: Name (David), Address (561 River Dr), City (Long Island), State (New York), Email (davidsmith@gmail.com), and Phone (7896541235). At the bottom left is a 'Submit' button, and at the bottom right is a red 'Delete this supplier' button.A screenshot of a 'Delete supplier' confirmation dialog box. It asks 'Are you sure you want to delete supplier David?'. There are 'Close' and 'Delete this supplier' buttons. The background shows the same 'Supplier Update' form for 'David' as the previous screenshot.