Math 1080: Spring 2019

Homework #4

Due Feb 15

In all problems below let A be $m \times n$ matrix, B be $n \times n$ matrix, and v be a vector in $\mathbb{R}^n$.

Problem 1:

Exactly how many flops are needed to perform the following lines of code?

a) `d = A*v;`
b) `C = A*B;`
c) `x = v'*B*v;` (in Matlab syntax `v'` represents the transpose of v.)
d) `x = A(1:n,:)*(B*v);`
e) `x = (A(1:n,:)*B)*v;` (this case differs from d) in the order of products)

Problem 2:

Exactly how many flops are needed to execute the following code segments?

a)
```
for k = 1:n
    a(k) = B(k,k)*v(n-k);
end
```

b)
```
for k = 1:n
    x = B(k,n-k+1:n)*v(n-k+1:n);
end
```

c)
```
for k = 1:n-1
    for j = n-k:n
        c = c + B(:,1:j)*A(n-j+1:n,k);
    end
end
```