CA226 – WinMips64 Floating point exercise II

Sum the series

$$F(z)=1+\sum_{j=1}^{\infty}(-1)^{j}\left(z^{(3j^2-j)/2}+z^{(3j^2+j)/2}\right)$$

For z=0.75. Use enough terms to yield a constant answer (i.e. until any further terms in the series are so small they do not affect the result.)

Its simpler than it looks - the first few terms are

$$1- z - z^2 + z^5 + z^7 - z^{12} - z^{15} + z^{22} + z^{26} \ldots$$

- Write a program in Java or C++ to calculate the correct answer, e.g.

```
double z,z2,z3,a,b,diffa,diffb,sum;
int i;
z=0.75;
z2=z*z;     // z^2
z3=z2*z;    // z^3
a=z;
b=z2;
diffa=z2*z2; // z^4
diffb=z2*z3; // z^5
sum=1.0;
for (i=0;i<5;i++) // is 5 enough?
{
      sum=sum-a-b;
      a*=diffa;
      b*=diffb;
      diffa*=z3;
      diffb*=z3;
      sum=sum+a+b;
      a*=diffa;
      b*=diffb;
      diffa*=z3;
      diffb*=z3;
}
cout << "sum= " << sum;
```

Convert the program to MIPS64 and get it working in WinMIPS64 using the minimum number of cycles (using default settings).

Hint: Use a different register for every variable.