

NUMERICAL ANALYSIS

PROGRAM SET A

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ABSTRACT. Create the following console programs using Visual C++. Send the software in .CPP files, and the output in .TXT files, to `plbailey@saumag.edu`, as an email attachment.

To capture output from a console application while in the VS 6.0 ADE, go to Project/Setting/Debug/Working Directory, and enter "> filename.TXT".

Program 1. Create a program to find, store, and list the first MAX primes. Write a subroutine which uses the table of primes to find the greatest common divisor between two integers.

Program 2. Create a program which implements the Euclidean algorithm to find the greatest common divisor d of two integers m and n , and also finds x and y so that $d = xm + yn$.

Program 3. Create a program to do base conversions, including:

```
char *D="0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz";
int btoi(char *ext, int base)
void itob(int num, int base, char *ext);
float btof(char *ext, int base)
void ftob(float num, int base, char *ext);
```

The function `btoi` converts the string `ext`, expressed in base `base`, into an internal (computer) integer. The function `itob` converts an internal integer into a string in base `base`, and stores the string in `ext`.

The function `ftoi` converts the string `ext`, expressed in base `base`, into an internal (computer) floating point number. The function `itob` converts an internal floating point into a string in base `base`, and stores the string in `ext`.

Program 4. Create a program to compute the cosine of a real number using Taylor series, using this prototype:

```
double cos(double x);
```

Shift x into the interval $(-\pi, \pi)$ for faster convergence.

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