DESIGN Prac 6

Individual:

Member variables:
 binaryString is string variable for the store the value of genes(binary string)

Methods:
 std::string getString() is function for output the bnary string with bitstring list
    int getBit(int pos) is function forreturn the bit value at the pos
    void flipBit(int pos) is function for take the position and flip the value
    int getMaxOnes() is function forreturn the longest of '1' in consecutie in the list
    int getLength() is function for return the length of the list
    Individual(int len) is constructorfunction for take the length and create a binary string
    Individual(std::string str)is constructor function for copy for the new list

Individual
+std::string binaryString
–std::string getString(); – int getBit(int pos); – void flipBit(int pos); –int getMaxOnes(); –int getLength(); –Individual(int len); –Individual(std::string str);

Mutator:
Member variables:
Individual* ind is a variable that new individual
k is for the position
Methods:
virtual Individual* mutate(Individual* ind,int k) is virtual function for mutate gene.

Mutator
+Individual* ind +int k
- virtual Individual* mutate(Individual* ind,int k);

Rearrange:
Member variables:
Individual* ind is a variable that new individual
k is for the position

Methods:
virtual Individual* mutate(Individual* ind,int k) is virtual function for select thek-th digit in the bitstring (again, counting in circles). This digit and alldigits after it (all the way to the tail) will be moved to the start of the list. Forexample, if you were rearranging the list (a,b,c,d,e) andk= 3, the function wouldreturn an Individual with the list (c,d,e,a,b).

Rearrange
+Individual* ind +int k
- virtual Individual* mutate(Individual* ind,int k);

BitFlip:
Member variables:
Individual* ind is a variable that new individual
k is for the position
Methods:
virtual Individual* mutate(Individual* ind,int k) is virtual function for flips the k-th binary digit. Ifkisgreater than the length of the list, we will count in circles. For example, if thelength of the list is 10 andk= 12, then themutatefunction will flip the seconddigit.

BitFlip

+Individual* ind +int k
- virtual Individual* mutate(Individual* ind,int k);

BitFlipProb:
Member variables:
Individual* ind is a variable that new individual
k is for the position
Methods:
virtual Individual* mutate(Individual* ind,int k) is virtual function for goes through every digit in the binary string and "flips" each of the binary digit with probability p.

BitFlipProb
+Individual* ind +int k + double p
- virtual Individual* mutate(Individual* ind,int k);

Testing:
1,input: 000000 2 0111 2
output: 010000 1110 3
2,input: 001100 7 011100 3
output: 101100 110001 2
3,input: 010001 1 01111 4
output:110001 11011 2